

THE STATE OF THE BORDER REPORT

A Comprehensive Analysis of the U.S.-Mexico Border



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TABLE OF CONTENTS:

Introduction	4
Chaper 1: Quality of Life.....	20
Chapter 2: Economics.....	60
Chapter 3: Security.....	90
Chapter 4: Sustainability.....	122
Conclusion.....	150
Authors' Biographies.....	159

HIGHLIGHTS FROM THE REPORT

- On Competitiveness:**
- Well over a billion dollars' worth of goods cross the border each day.
 - Long and unpredictable wait times at the border ports of entry are costing the United States and Mexican economies many billions of dollars each year.
 - Trusted traveler and shipper programs (SENTRI, FAST, C-TPAT) allow vetted, low-risk individuals and shipments expedited passage across the border. Improving these programs and significantly expanding enrollment could increase border efficiency with minimal investments in infrastructure and staffing—all while strengthening security by giving border officials more time to focus on unknown and potentially dangerous individuals and shipments.

- On Security:**
- The more the two governments can push key security processes away from the border, the better, as an overconcentration of resources at the border (and particularly between the ports of entry) has the potential to distract from a more strategic distribution of security resources throughout the U.S., Mexico and beyond.
 - While it is difficult to predict future flows of migrants, we seem to be at or past a point of diminishing returns in terms of improving border security through increases in Border Patrol staffing.

On Sustainability:

- For more than a century, shared surface water resources have been managed according to bilateral treaties and agreements. The growing population of the border region and the advent of water intensive methods of drilling for oil and gas heighten the urgency for transboundary groundwater resources to be addressed proactively and binationally. Data sharing regarding subsurface water would be a natural place to start.
- The La Paz agreement and the environmental institutions formed alongside NAFTA have focused U.S.-Mexico environmental cooperation on managing pollution in the border region. In order to promote the development of vibrant and sustainable communities, much more emphasis must be put on shared resource management.
- The potential for renewable energy in the border region is significant. Inadequate transmission infrastructure and limited incentives for renewable generation projects currently limit its development.

On Quality of Life:

- The overall quality of life on both the U.S. and Mexican sides of the border region improved between 2000 and 2010. Though there is still a major cross-border asymmetry in many of the quality of life indicators, the quality of life gap between U.S. and Mexican border communities decreased slightly between 2000 and 2010.
- Lasting progress in improving quality of life can only result from the combination of independent national policies and binational efforts. Through complementary development strategies, the investments of each country can be mutually reinforcing, creating a virtuous cycle of development and raising living standards.



INTRODUCTION

Christopher Wilson and Erik Lee

A Poorly Understood Region with Great Challenges and Even Greater Potential

Though more often characterized as a source of security threats and vulnerabilities, the U.S.-Mexico border is also a modern frontier with immense opportunities. The joining together and in many ways overlapping of two great countries and societies has created a region fertile with business opportunities, rich in culture, and full of delicate natural treasures. Many of the unique opportunities presented by the border remain untapped, hidden away from the nations' financial centers and capitals. But as those that live and work in the region know, the state of the border is stronger than most realize. For some time, this poorly understood area has needed a comprehensive and accessible yet careful and evidence-driven analysis for policymakers and citizens alike.

There is a traditional notion in foreign relations that 'politics stops at the water's edge,' that domestic politics are distinct from foreign policy. While this concept can be contradicted with cases from around the world, the complex and intense mix of local, state, national and international constituencies that have vested interests in the U.S.-Mexico border may comprise the best counterexample of all. Managing the U.S.-Mexico border is extraordinarily difficult and made more so by its intense mix of international and domestic policy issues. This is particularly true in the area of security. In a post-9/11 and post-Great Recession context, lawmakers and law enforcement officials in both countries

Managing the U.S.-Mexico border is extraordinarily difficult and made more so by its intense mix of international and domestic policy issues.

have been asked to make the border efficient and user-friendly for legitimate travelers and impenetrable for those with more nefarious objectives. The task is made more complicated by the fact that migration, drugs and border security are among the most politically charged issues in both countries while the U.S. and Mexican economies depend heavily on binational trade. This enormous and poorly understood region presents both nations with policy challenges so vexing that they tend to obscure and overshadow areas of far more positive and even impressive interaction and collaboration.

Border Management: A Binational *and* East-West Challenge

For those charged with negotiating the matrix of political and pragmatic challenges that make up the gauntlet of border policy, there are precious few axioms. Even the landmark North American Free Trade Agreement cannot quite frame the entirety of the U.S.-Mexico relationship. Through a historical process of trial and error, the two nations have arrived at, yet not fully implemented, two key concepts that can guide interaction at their shared border: **coordination and collaboration**. At the border, the United States and Mexico must manage complex transnational problems *and* remarkable shared opportunities. Watersheds and wildlife pay little attention to national boundaries, and transnational criminal groups actively seek to exploit regulatory and jurisdictional divides. But with a half-trillion dollars in bilateral trade powering the national economies throughout both countries, border management has implications that extend far beyond the border region itself.

In such an environment, cooperative binational solutions are often the only solutions. Unfortunately, an institutional void exists that makes managing such complex interaction across the U.S.-Mexico border particularly challenging. While the U.S. State Department and Mexico's Foreign Ministry formally manage federal government-to-government interaction, a large number of federal agencies, state and local governments also have a significant say in how the border is run. Chief among these is the U.S. Department of Homeland Security (DHS), formed in the wake of the events of September 11, 2001 to better organize U.S. efforts to defend itself from terrorist attacks. The importance of DHS

in border interaction cannot be overstated, and its creation represented both a **securitization of the border**, which made the border thicker for both illicit and legitimate traffic, but also an effort to better coordinate border management. Interagency coordination can also be difficult. Adding to this is the large number of state agencies as well as local governments that must conduct international work with their counterparts in the U.S. or Mexico. While there are formal and *de facto* agencies that manage our border interactions, **no binational organization exists to coordinate efforts across areas such as those examined in this volume: quality of life, trade, security and environment.**

In a curious way, the border tends to divide east and west as often as north and south. Officials, businesses and civil society in El Paso, for instance, are generally more accustomed to reaching across the border to speak with counterparts in Ciudad Juárez to manage a shared challenge than they are to do so with those in San Diego. While the existence of these north-to-south corridors of activity are natural and beneficial, the relative lack of trans-corridor communication and collaboration can be problematic and work against formulating helpful policies for the entire region. Healthy competition among corridors to attract businesses and federal attention is a sign of a functioning market and democracy, but to the extent that border communities face common issues, they could also benefit by sharing best practices and speaking to their federal governments with a unified voice.

In a curious way, the border tends to divide east and west as often as north and south.

While much is left to be done, significant progress has also been made. In **2010, the U.S. and Mexican presidents jointly affirmed their commitment to build a 21st Century Border.** The initiative was formed around two key concepts. First, both governments' interagency border management processes were aligned to strengthen domestic and especially binational coordination. Second, they developed a conceptual framework that asserts border security and

efficiency need not come at the expense of one another, along with a series of implementing strategies. Officials on both sides of the border generally feel that the new coordinating mechanisms have effectively facilitated macro-level federal to federal coordination and joint planning, although major challenges remain in strengthening on-the-ground binational links to improve policy implementation. The implementation of policy tools to improve border security while reducing congestion—such as trusted traveler programs, customs preclearance, lane management techniques, and new scanning and identification technologies—has generally advanced, though their potential is still much greater than current levels. Finally, the recently signed **Colorado River Agreement** represents a major advance in the joint management of shared resources and may serve not only as a model for future U.S.-Mexico collaboration but perhaps also as a precedent for the rest of the world.

TRENDS TO FOLLOW ON THE U.S.-MEXICO BORDER

Citizens and policymakers alike rely heavily on key indicators to ascertain the current reality and potential future trends in a variety of public policy areas. For example, in the United States, measurements such as the Dow Jones Industrial Average and the unemployment rate are used as proxies for a broader notion of the country's economic health and even drive other important factors such as investor and consumer confidence. In Mexico, the exchange rate between the peso and the U.S. dollar has historically been closely followed as an indicator of the Mexican economy's relative strength.

Unfortunately, there is no one measurement of the U.S.-Mexico border that can allow us in one simple glance to ascertain our progress on the major public policy issues. As we have tended to view the border through the lenses of immigration and security, perhaps the best-known measurement in the United States has been apprehensions of undocumented migrants by the U.S. Border Patrol.

But apprehensions are far from the best or only indicator of the health of the U.S.-Mexico border region. **The *State of the Border Report* analyzes a variety of both qualitative and quantitative data in our chapters on quality of life, sustainability, security and trade.** In many cases, data on the ideal indicators to measure each phenomenon is either unavailable or not complete enough to arrive at a definitive conclusion, in which case we either use the best data available or, at times, anecdotal evidence for clues on the progress or continuing challenges in each public policy area we are analyzing.

For this and other reasons we are developing the **Transborder Development Index (TDI)**, the backbone of the Transborder Information System, a joint project between ASU's School of Transborder Studies and El Colegio de la Frontera Norte intended to support decision makers in the public, private and social sectors. The TDI tracks four dimensions that are crucial for the integral development of the U.S.-Mexico transborder region: **competitiveness, sustainability,**

security and quality of life. The TDI is discussed in more depth in the chapter on quality of life.

Below we aim to give the reader a sampling of some of the key trends to follow as the U.S.-Mexico border continues to evolve.

QUALITY OF LIFE

The last several decades have seen remarkable population growth in the U.S.-Mexico border region, a demographic fact which heavily influences all aspects of life in the region, particularly in the areas looked at in this report: trade, sustainability and security. In his chapter on quality of life in the U.S.-Mexico border region, Francisco Lara notes, "In the last decade, border *municipios* and counties grew faster than their respective states and nations."

The table below shows current population estimates for each of the border configurations, along with average growth and doubling times. Lara notes that in 2010, border *municipios* and counties, the border strip (100 km to the north and 300 km to the south of the border and border states), comprised 3.5%, 7.4%, and 21.6%, respectively, of the combined population of the two countries. In the last decade, border *municipios* and counties grew faster than their respective states and nations. At current growth rates, the combined population of border counties and *municipios* will double in about 35 years, reaching 29 million residents in 2045 and comprising about 5% of the combined population of both countries.

Population and Population Growth in the Border Region (pg. 29)

	Population 2010	Average annual growth (%), 2000-2010	Duplication Time (years)
Counties and municipios			
Mexico, border municipios	7,304,901	2.24	31
United States, border counties	7,303,754	1.62	43
Total	14,608,655		
100/300 kilometers			
Mexico, 300 km	17,048,419	2.04	34
United States, 100 km	13,967,038	2.28	30
Total	31,015,457		
Border states			
Mexico	19,894,418	1.95	36
United States	70,850,713	1.49	47
Total	90,745,131		
Mexico	112,336,538	1.52	46
United States	308,745,538	0.97	71

Source: U.S. Census Bureau and INEGI.

SUSTAINABILITY

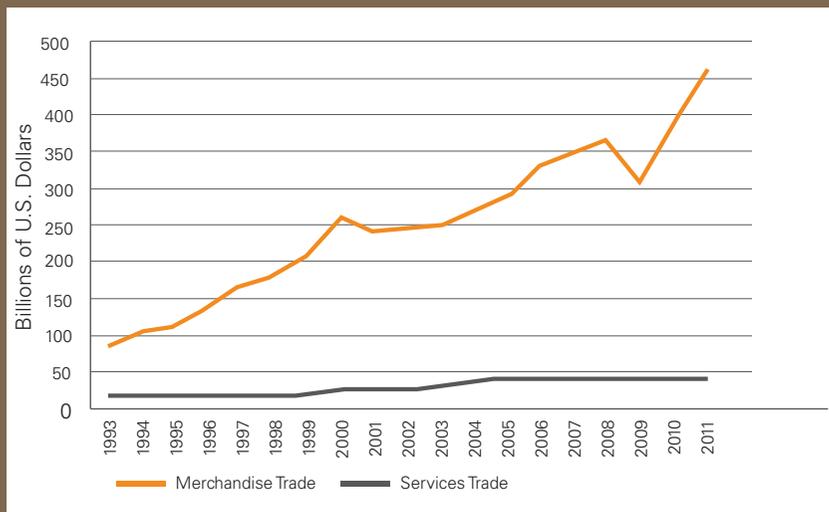
Groundwater is a key issue to watch over the next several years with regards to border region sustainability. As Carlos de la Parra, Rick Van Schoik and Kristofer Patron point out in their chapter, it is the lack of bilateral information sharing or agreements on transboundary groundwater resources that currently stands out. Nonetheless, as the growing population noted above and growing demands of industry and agriculture in the region put greater stress on these vital shared resources, joint management will become a necessity. As a result,

one could reasonably suppose that the number of studies of shared ground-water resources, independent and government sponsored, will increase in the years to come. What those studies find, and how the governments of the United States and Mexico respond to the challenges they bring to light, will be a key trend to follow. Hopefully the recent progress on joint management of the Colorado River watershed is a sign of the approach both nations, and the relevant subnational governments, choose to take.

TRADE

The remarkable expansion of the U.S.-Mexico commercial relationship during the NAFTA era is an underappreciated story, as Erik Lee and Christopher Wilson point out in their chapter on bilateral trade. One graph from this chapter tells a variety of stories, including this increase in merchandise trade as well as an **under-exploited area, services trade (which includes tourism, healthcare, transportation, financial services, etc.).**

U.S.-Mexico Bilateral Trade in Goods and Services, 1993-2011 (pg. 62)



Source: U.S. Department of Commerce, Bureau of Economic Analysis and Census Bureau

SECURITY

As authors Eric Olson and Erik Lee note, “The state of security along the U.S.-Mexico border easily ranks as one of *the* most highly charged topics of public discussion and debate in *both* the United States and Mexico during the past several years.” Indeed, one of the key topics in the current discussion on comprehensive immigration control is establishing an objective measure of border security.

The lack of a widely accepted measure of border security is one key reason for the ferocity of debate on this topic. Both U.S. and Mexican federal government statistics have shown that violent crime continues to fall in the major cities along the U.S.-Mexico border, particularly **San Diego, Tijuana, El Paso and Ciudad Juárez**. Perhaps the best-known border security measurement in the United States has been apprehensions of undocumented migrants by the U.S. Border Patrol. While these numbers have been falling in a majority of Border Patrol sectors for a number of years, the relative importance of border enforcement, economic cycles and other factors in determining immigration trends is the subject of debate, and immigration traffic tends to move east or west along the border in response to stepped-up enforcement efforts. The table below shows recent U.S. Border Patrol apprehension figures for the various Border Patrol sectors and the high points in apprehension statistics for each.

U.S. Border Patrol Apprehensions for Southwest Border Patrol Sectors, FY 2011 and FY 2012 (pg. 113)

Sector	Staffing	FY 2011 Apprehensions	FY 2012 Apprehensions	Peak Apprehen- sions 1992- 2011/year
Big Bend	667	4,036	3,964	15,486 (1998)
Del Rio	1,626	16,144	21,720	157,178 (2000)
El Centro	1,164	30,191	23,916	238,126 (2000)
El Paso	2,738	10,345	9,678	285,781 (1993)
Laredo	1,871	36,053	44,872	141,893 (1997)
Rio Grande Valley	2,504	59,243	97,762	243,793 (1997)
San Diego	2,669	42,447	28,461	565,581 (1992)
Tucson	4,239	123,285	120,000	616,346 (2000)
Yuma	969	5,833	6,500	138,438 (2005)

Sources: *United States Border Patrol Apprehensions / Seizure Statistics - Fiscal Year 2011*, http://www.cbp.gov/linkhandler/cgov/border_security/border_patrol/usbp_statistics/fy_profile_2011.ctt/fy_profile_2011.pdf and *United States Border Patrol Southwest Border Sectors Total Illegal Alien Apprehensions By Fiscal Year*, http://www.cbp.gov/linkhandler/cgov/border_security/border_patrol/usbp_statistics/usbp_fy12_stats/appr_swb.ctt/appr_swb.pdf.

Why This Report Now?

The recent revival of discussions over **immigration reform in the United States** Congress also revived a related discussion over evaluating border security from an objective standpoint. In this context, several lawmakers called for the creation of a regional group of governors, attorneys general and other officials to evaluate whether the border was secure or not. Regardless of the outcome of the current efforts on immigration reform or this particular provision, its existence points toward the lack of non-partisan, evidence-driven analysis to inform debate among policymakers and citizens alike. *The State of the Border Report* was undertaken in order to address this lack of objective, longitudinal analysis within an overall qualitative framework that looks at the main goals and objectives of the binational relationship. The report seeks to provide analysis of the key issues, build a snapshot that can be revisited in the future to measure progress, and suggest strategies for better policy.

We hope to demystify the border for Washington DC, Mexico City and the general public, bringing out the complexities of the *real* U.S.-Mexico border in a way that facilitates the development of policies that can achieve broad-based support on both sides of the border and across the political spectrum. In short, we hope to create a comprehensive, forward leaning, evidence-driven assessment of the border.

Organization of Report

The report is comprised of four core chapters on quality of life, sustainability, competitiveness and security as they relate to the U.S.-Mexico border region.

Chapter One was written by Francisco Lara and focuses on quality of life

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issues. This chapter is cross-cutting and data intensive. Through the development of the innovative Transborder Development Index (see box 1 in chapter 2 for details on the TDI), Lara presents a comprehensive overview of life in the U.S. counties and Mexican municipalities that lie along the border, as well as a statistical baseline for future reports on the state of the border. He finds that despite the development of numerous new challenges that have developed in parts of the border region over the past decade, especially regarding public security, overall quality of life has increased. By grounding the reader in a statistical snapshot of life on the border, the chapter cuts through popular misconceptions about the region and sets the stage for the other three more policy-oriented chapters. Yet more than simply providing background information, Lara suggests that a greater focus on economic and social development in the border region would complement and even magnify efforts to improve competitiveness, security, and sustainability.

Chapter Two focuses on the enormous—though underappreciated—U.S.-Mexico commercial relationship. Border management directly affects this relationship, as a large majority of this trade passes through the land ports of entry from San Ysidro/Tijuana to Brownsville/Matamoros. In “The State of Trade, Competitiveness and Economic Well-being in the U.S.-Mexico Border Region,” authors Christopher Wilson and Erik Lee argue that better, cooperative border management could not only fuel growth in the border region economy but could also create jobs and strengthen the competitiveness of manufacturers throughout both countries. They identify opportunities to further implement new border management techniques, which make the border more difficult to cross for illegal and dangerous traffic while facilitating the flow of beneficial commerce.

Chapter Three looks at a fiercely debated topic: border security. In “The State of Security in the U.S.-Mexico Border Region,” authors Erik Lee and Eric Olson discuss how concerns about global terrorism, potential threats posed by those entering the United States illegally, and fears that skyrocketing violence in Mexico might “spill over” into the United States have led to dramatic policy shifts and significant new investments by the United States to “secure” the border.

A snapshot of security issues at the U.S.-Mexico border reveals increasing—though always controversial—federal involvement in a region that has historically maintained some degree of independence from both national capitals. The unprecedented post-9/11 U.S. security buildup along the border stands out as a key feature of the increased federal role and is exemplified by the buildup in federal personnel. The chapter suggests what may be a counterintuitive approach to border security—that instead of continuing to amass resources along the physical border itself, greater law enforcement cooperation to address risks far away from the border would be more effective.

Border security and regional development cannot be effectively addressed in isolation. They are mutually reinforcing, but they also depend greatly on the sustainable management of the resources—air, water, energy, land, wildlife and climate—that the people and businesses of the border region depend on as they live, work and play. Chapter Four, “The State of the Environment in the U.S.-Mexico Border Region,” by Carlos de la Parra, Rick Van Schoik and Kristofer Patron-Soberano, looks at the many areas in which the two nations interact, both officially and unofficially, on issues of sustainability. They find that even as advances have been made on several fronts, notably the management of the Colorado River watershed, the overall conceptual framework for binational environmental management needs to move beyond its traditional focus on issues of pollution in order to address the increasingly urgent challenges of shared resource management. This is an area of significant binational interdependence and cooperation that does not often receive the attention it deserves and requires.

Looking Forward, Looking Outward

Though controversy often swirls around how the two nations monitor and regulate the border, current levels of coordination, cooperation, and understanding are unprecedented. Major steps forward have been taken in recent years, but at the same time the pressures put on the border region continue to evolve and continue to create significant policy challenges for both nations. The complex and interrelated challenges that must be managed to create a

secure, sustainable and competitive border demand ever greater cooperation and creativity along and across the nearly **two thousand** miles that make up the U.S.-Mexico boundary.

Though far from easy to achieve, success in managing the intense interaction and incredible diversity that make up the border is invaluable. It ripples outward. Of course, the 15 million people that live in the counties and municipalities along the border benefit enormously when the border is working. So do the 91 million residents of the border states who depend on the air, water and commerce that flow across the border. But far beyond the border, the six million people throughout the United States and many millions more in Mexico with jobs supported by bilateral trade depend in a very real way on the border's ability to safely facilitate binational flows of people and goods. For them, an efficient border means a steady job, and an even more efficient border can lead to greater employment opportunities. Indeed, the competitiveness of the entire North American economy depends on the border. Should major advances in border management take root, the benefits of a better border have the potential to ripple out even further. Cross-border cooperation could send a signal that the complex transnational challenges that characterize the 21st century are better met in a context of mutual respect and shared responsibility than one of conflict and nationalism. Border management is difficult, but it is worth the effort.



CHAPTER ONE: QUALITY OF LIFE IN THE UNITED STATES-MEXICO BORDER REGION: CURRENT STATUS AND EMERGING TRENDS

Francisco Lara-Valencia

EXECUTIVE SUMMARY

This chapter provides a statistical snapshot of life along the border and develops a method to measure quality of life in the border region using accepted indicators and procedures, relying on **comparable data from Mexico and the United States**. The quality of life on each side of the border is intimately intertwined with the quality of life on the other side due to historical, social and geographical factors that connect the people and places in this region in a way that is unique. It is critical that policymakers on both sides of the border acknowledge this fact and make it an integral part of the plans and programs targeting economic opportunity, health, education, culture, and community life—that is, the quality of life—of the people living in the border region.

The state of quality of life in the region is one of asymmetry and change. Between 2000 and 2010, the quality of life gap across the border became slightly less marked even as development remained asymmetrical. **Mexican communities are ranked in the lower half of the scale for most indicators of wellbeing**. During the same period, and despite several new challenges, the overall wellbeing of the region increased. Still, there is much catch-up to do to close the gap and raise the quality of life for all residents in the transborder region.

This includes strengthening the emphasis on equity and the elimination of disparities that disproportionately affect the educational, economic and health opportunities of the poor, ethnic minorities and other disfranchised social groups. A greater focus on quality of life would provide the opportunity to reframe the entire management strategy implemented in the border region over the past decades, crafting a new discourse, one based as much on human development as it is on trade, competitiveness and security.

Lasting progress in improving quality of life can only result from the combination of independent national policies and coordinated and collaborative cross-border efforts. On the Mexican side, several key challenges stand out, including crime prevention, the expansion of educational opportunities for youth and the elimination of barriers that limit a greater participation of women in economic life. On the U.S. side, regional policies and plans need to target the reduction of infant mortality rates and poverty, chronic issues in border counties. The two countries, including all levels of government, civic and private sector leaders, must work together to identify areas where public and private resources can be invested in more effective and innovative ways. By introducing complementary border development strategies, the investments of each country can be mutually reinforcing, creating a virtuous circle of development and rising living standards.

The options at hand are broad in range. The two countries could benefit, for example, from greatly strengthening exchange programs that allow Mexican students to pursue graduate studies in the U.S. and vice versa. Such programs can contribute significantly to the formation of specialized human resources needed in Mexico, while strengthening intercultural competencies and human capital in the whole transborder region. Public-private partnerships offer another opportunity, as shown by programs aiming to eliminate chronic cross-border gaps in health or poverty, such as the binational health councils, which combine local expertise and resources to fight communicable and chronic diseases resulting from social disparities.

Much work remains to be done to understand, accurately measure, and ultimately improve quality of life along and across the vast expanses of the U.S.-Mexico border region. By taking steps toward the development of reliable indicators for several of the dimensions of wellbeing and quality of life, this chapter seeks to provide policymakers the tools they need to take action in support of the millions of residents of the border region.

KEY FINDINGS:

- The five U.S. border counties with the best quality of life are: 1. San Diego, CA, 2. Pima, AZ, 3. Brewster, TX, 4. Jeff Davis, TX, and 5. Cochise, AZ.
- The five Mexican border municipios (municipalities) with the best quality of life are: 1. Tijuana, BCN, 2. Mexicali, BCN, 3. Nogales, Son., 4. Tecate, BCN, and 5. Piedras Negras, Coah.
- Growing faster than the national average in either country, between 2000 and 2010 the combined population the U.S. border counties and Mexican municipios increased by 19.2%. This population will double in about 35 years, with most of the growth occurring in mid-size and large urban conglomerates.
- Unemployment on the U.S. side of the border has been chronically high (Imperial Valley, CA had 29.7% unemployment in 2010), while Mexican border municipios enjoy lower than average rates.
- In 2010, an estimated 55 percent of the population aged 25 or above in border counties had earned the equivalent of a high-school degree or better. In comparison, 34 percent of the same cohort living in Mexican border municipios had completed at least high school.
- On average, border counties had 384 health workers per 10,000 residents in 2007, much greater than the average of 52 health workers per 10,000 residents in border municipios.
- U.S. border counties have 59 non-profit sector workers per 10,000 residents, while border municipios have just seven per 10,000 residents.

QUALITY OF LIFE

Introduction

The United States-Mexico borderlands present two characteristics that result in substantial challenges for traditional social and development policy. First,

Quality of life reflects the extent to which citizens benefit from public and private actions with impacts on the economy, education, equity, safety, and the livability and sustainability of the places where they live. At a more human level, quality of life is a synopsis of the impacts of market and government driven actions on the fulfillment of personal and family aspirations of prosperity, health and happiness.

as regional economic policies have largely ignored social and environmental issues, the deficits affecting the well-being of people along the border have increased in magnitude. South of the border, income and employment levels above the national average coexist with health and education indicators that are clearly deficient from a Mexican standpoint, while in the United States many border counties struggle with rampant poverty and disease levels that place them among the worst in the country. Second, the border is not only one of the fastest growing regions in North America; it is also a space where a long and profound history of cross-border human interactions is paralleled by deep national disparities. Oscar Martínez has noted that although the U.S.-Mexico border shares many characteristics with other border regions in the world, this region is unique because it comprises a territory where millions of citizens of “two very dissimilar nations” live shoulder to shoulder

and interact with each other in a very intense and diverse way.¹

In this context, during the past two decades, Mexico and the United States have aggressively pursued actions to reduce lingering deficits in their respective territories and jointly address chronic development gaps affecting both sides of the border. These include the promotion of trade and regional economic growth; substantial investment in environmental infrastructure; development of local capacity for planning and governance; and the creation of a new institutional framework for cross-border cooperation. Despite such efforts, profound disparities still persist and the region as a whole continues to face substantial deficits in areas directly impacting the quality of life of its residents. In the last few years, an increasingly uncertain global economy along with widespread drug-trafficking related violence added new elements of deterioration and polarization to the living conditions of people, particularly in Mexican border communities. Quality of life issues, therefore, have regained prominence in the region's policy agenda, along with the need to better understand what is new and what remains unchanged in the living conditions and livelihood of border residents.

This chapter reports and analyzes indicators generally used by specialists to ascertain whether a region is improving wellbeing and the living conditions of its residents. Because the aim of this chapter is to present a binational assessment of the region, the indicators evaluated here refer to factors measured more or less consistently across the border and that have been identified as being valid markers of progress in improving quality of life at the local level. Therefore, this analysis excludes indicators for which information is available for only one side of the border and those with a geographical scope inconsistent with a local assessment of quality of life.

Although it is common to reduce the concept of quality of life to a mere indicator of the prevailing living conditions, we prefer the idea that quality of life is ultimately a dimension of social life that absorbs and reflects the combined and dynamic effect of institutional and non-institutional factors on individual and collective wellbeing. In this chapter, quality of life is understood as a crucial dimension of development and public policy reflecting the extent to which citizens benefit from public and private actions with impacts on the economy, ed-

ucation, equity, safety, and the livability and sustainability of the places where they live. At a more human level, quality of life is a synopsis of the impacts of market and government driven actions on the fulfillment of personal and family aspirations of prosperity, health and happiness.

The chapter is organized as follows: After this introduction, section two presents data that reveal some of the processes that make the U.S.-Mexico border unique from a social and development policy perspective. The third section provides an overview and analysis of quality of life indicators related to four overlapping domains: **economic opportunity; education and culture; healthy life; and community life.** To the extent possible, the section assesses the current status of indicators in these four domains, and tries to identify emerging trends. It also covers output and outcome indicators in an attempt to capture the fluid nature of quality of life as well as the importance of basic minimums for wellbeing in general. Section four reviews the main result of a quality of life index (QOL) created to compare outcomes across the region and standardize the measurement of change across domains. The final section puts forward some conclusions and suggests some areas in need of intervention to improve wellbeing in the border region as a whole.

The Regional Context

The United States-Mexico international boundary—from San Diego-Tijuana on the Pacific to the Brownsville-Matamoros area on the Gulf of Mexico—is the backbone of a distinct region where the interactions between the people and economies of Mexico and the United States are the most intense as well as the most diverse. Within the borderlands, trade, migration, tourism, rivers, and ecosystems are the conveyors of cross-border interactions infusing the region with its unique character as a hybrid and dynamic social space. As shown in Figure 1, the border region has different territorial configurations depending on the chosen definition. As explained by Gerber et al., each of these configurations has the ability to capture cross-border processes that occur functionally at different spatial scales.²

The first of these configurations, and perhaps the most relevant from a policy

BOX 1: THE TRANSBORDER DEVELOPMENT INDEX

The Transborder Development Index (TDI) is the backbone of the Transborder Information System, a joint project between the ASU's School of Transborder Studies and El Colegio de la Frontera Norte intended to support decision makers in the public, private and social sectors. The TDI tracks four dimensions that are crucial for the integral development of the U.S.-Mexico transborder region: competitiveness, sustainability, security and quality of life.

The TDI aims to gauge the effectiveness of public policies, public-private partnerships, and citizen-based initiatives in moving the region toward higher development grounds and closing north-south and rural-urban development gaps observable along the border. It also aims to provide a platform to evaluate and envision policies and strategies capable of moving the region quicker along a trajectory of comprehensive development.

The TDI is a composite index comprised of **sixty-four indicators** grouped in four fully embedded and complementary sub-indices: competitiveness, sustainability, security, and the quality of life sub-index that this chapter develops. After an extensive assessment of existing data sources in Mexico and in the United States, a group of variables was selected to construct the indicators. As the building blocks of the index, variables had to meet the standard of **theoretical relevance**, as well as the **conditions of temporal, spatial and conceptual comparability** required for an index able to compare directly states and municipalities across and along the border. The final selection of variables and indicators was the result of a systematic evaluation process, guided by the goal of producing a measurement tool conceptually and methodologically robust, while maintaining an appropriate level of simplicity and transparency for its use in the public, private and social sectors.

The index provides a panoptic view of the current status and progress of the U.S. states of **Arizona, California, New Mexico and Texas** and the Mexican States of Baja California, Chihuahua, Coahuila, Nuevo León, Sonora and Tamaulipas, as well as the **sixty-four counties and municipalities** contiguous to the common international boundary.

point of view, includes the **forty Mexican *municipios*** (municipalities) and **twenty-four** U.S. counties that straddle the international boundary. Under this definition, the administrative boundaries of *municipios* and counties outline a geographical scale where most of the social, economic and cultural interactions that make the border region a binational space take place. The second configuration, adopted in 2004 by the North American Development Bank (NADBank) and the Border Environment Cooperation Commission (BECC) for programmatic purposes, covers **three hundred kilometers in Mexico and one hundred kilometers in the United States**. Although clearly administrative in character, this definition captures important cross-border processes that take place at the scale of air basins or within regional economic corridors connecting mid-size metropolitan markets like Hermosillo-Tucson and Saltillo-Monterrey-McAllen. A third configuration comprises the territories of the ten states – six in Mexico and four in the United States – that touch the international boundary. The relevance of this definition results from the important role played by state governments and public-private partnerships in promoting trade, tourism, investments, educational exchange, or law enforcement cooperation. The substantial role played by state governments in border matters is illustrated by the uninterrupted work of organizations like the Arizona-Mexico Commission and the release in 2009 of the *Strategic Guidelines for the Competitive and Sustainable Development of the U.S.-Mexico Transborder Region* by the Border Governors Conference.³

Figure 1: The Different Territorial Configurations of the U.S.-Mexico Border Region



Source: School of Transborder Studies, Arizona State University, September 2012.

Regarding quality of life, there are four fundamental layers of cross-border amalgamation occurring with varied intensity at these different regional configurations: spatial confluence, functional articulation, institutional convergence and social connectivity.

Spatial confluence is driven by **population growth** and **rapid urbanization**, two socio-territorial processes characteristic of the border in recent decades. Table 1 shows current population estimates for each of the border configurations, along with average growth and doubling times. In 2010, border *municipios* and counties, the 100/300-kilometer border strip, and border states, comprised 3.5%, 7.4%, and 21.6%, respectively, of the combined population of the two countries. In the last decade, border *municipios* and counties grew faster than their respective states and nations. This higher pace of growth is the result of continued net migration to the region since at least 1950, and natural population growth rates exceeding national averages among most U.S. border counties.⁴ At current growth rates, the

combined population of border counties and municipios will double in about 35 years, reaching 29 million residents in 2045 and comprising about 5% of the combined population of both countries.

Table 1: Population and Population Growth in the Border Region

	Population 2010	Average annual growth (%), 2000-2010	Duplication Time (years)
Counties and municipios			
Mexico, border <i>municipios</i>	7,304,901	2.24	31
United States, border counties	7,303,754	1.62	43
Total	14,608,655		
100/300 kilometers			
Mexico, 300 km	17,048,419	2.04	34
United States, 100 km	13,967,038	2.28	30
Total	31,015,457		
Border states			
Mexico	19,894,418	1.95	36
United States	70,850,713	1.49	47
Total	90,745,131		
Mexico	112,336,538	1.52	46
United States	308,745,538	0.97	71

Source: U.S. Census Bureau and INEGI.

Central to the demographic expansion of the borderlands has been the rapid urbanization of the region. Cities like Tijuana, Juarez or Mexicali transitioned from medium-size border urbanizations in the 60s to burgeoning metropolises in recent times.⁵ In 2010, 93.7% of the population of the region lived in cities and urbanization rates exceeding 85% are the norm in most municipalities on both sides of the border. In fact, most of the region’s population growth in the next few decades will occur in mid-size and large urban centers intensifying an undergoing process of border metropolization. Especially on the Mexican side, the pace of urban growth will be highest in large border cities and

municipalities and it is predicted that the proportion of the population living in urban centers with more than half a million people will rise to 58.1 percent in 2030, from about 44.6 percent in 2005.⁶ Already, urban conglomerates like Tijuana-San Diego and Brownsville-Matamoros fuse across the border, forming dynamic transborder metropolises that are merging relentlessly with other border cities within their hinterland.⁷ Comparable processes of spatial confluence are observable in the El Paso del Norte region and even in smaller urban agglomerations like Ambos Nogales in the Sonora and Arizona border region. The important point here is that the formation of these densely populated places along the border has serious implications for the wellbeing of the people living in them due to neighboring effects. On the positive side, the

On the positive side, the larger the urban agglomeration the broader the range of choices border residents have in term of consumption, amenities and jobs. On the negative side, larger conglomerations of people lead to congestion, pollution, crime, and health hazards.

larger the urban agglomeration, the broader the range of choices border residents have in terms of consumption, amenities and jobs. On the negative side, larger conglomerations of people lead to congestion, pollution, crime, and health hazards. The net result of the neighboring effects depends on the stability of cross-border interactions and the effectiveness of existing mechanisms of communication and collaboration across the border.

Over time, and at varied levels, the borderland has evolved into an increasingly interdependent regional space. Examples of functional articulation are transborder tourism, trade, and supply-chains connecting the economies of both sides of the border region.⁸ Between 2000 and 2010, an average of 231 million people and 85 million cars and buses crossed into the United States from Mexico, reflecting a highly integrated and interdependent region. After

NAFTA, U.S.-Mexico trade flowing through existing border land ports grew vastly from \$71 billion in 1995 to \$255 billion in 2010.⁹ At the more local level, it has been estimated that an increase of 10% in *maquiladora* activity in Mexican border cities leads to an increase in employment in U.S. border cities through the expansion of wholesale trade (2.1-2.7%), transportation (1.7-2.1%) manufacturing (1.2-2.1%) and retail trade (1.0-1.8%).¹⁰ A not less telling marker of the level of functional articulation that connects communities along the border is the fact that many new businesses in U.S. border towns are being created by Mexican entrepreneurs and the retail sector in these places depends critically on Mexican cross-border shopping.¹¹ The level of cross-border articulation also has direct implications on the wellbeing of border residents. The more articulated border economies become, the less control national communities have over forces and factors that define their wellbeing. Functional articulation results in complementarities and co-dependencies with potential effects on the standard of living of border residents. In periods of economic growth, functional articulation has the potential to lead to greater economic benefits; however, in periods of poor growth it can actually make things worse. Increasing cross-border integration has both benefits and risks. In order for the benefits to outweigh the risks, policymakers must coordinate and collaborate across the international boundary.

The fact that the border is a bicultural space with local interests overlapping in a way that largely ignores the international boundary has demanded continuous coordination and cooperation among regional actors in a variety of areas with direct implications for the wellbeing of border communities. The result of this has been an assortment of local, regional, informal and official mechanisms of cross-border cooperation which have led to a degree of institutional convergence unique to the borderlands. Some markers of institutional convergence in the U.S.-Mexican border region are the formation of binational organizations like the Border Environment Cooperation Commission, the U.S.-Mexico Border Health Commission or the Border Governors Conference. Comparable efforts at the local levels are the creation of the U.S.-Mexico Border Mayors Association or the U.S.-Mexico Border Philanthropy Partnership. Other examples are city-to-city, citizen coalitions and business partnerships created to resolve

particular problems or pursue broader agendas. All these entities have evolved into an important component of the institutional infrastructure and social capital created in the border to overcome the many barriers to collaboration resulting from national disparities and differences, and to cope with the structural contradictions of the relationship between the two countries.¹² There are many examples of collaborative mechanisms along the border that facilitate the exchange of resources, enhance complementarities, build partnerships and promote policy action that contribute to close the development gaps and raise the wellbeing of border communities. The effectiveness of these mechanisms is critical for the quality of life afforded by the border to its residents.

Transborder family relations are basic ingredients of quality of life and make the wellbeing of Mexico's border communities inextricably linked to the wellbeing of United States' border communities, and vice versa.

Finally, according to the 2010 census, 10.3% (31,798,258) of the people living in the U.S. are of Mexican origin. More importantly, people of Mexican origin make up a much more significant percentage of the population in states bordering Mexico: 31.6% in Texas, 30.7% in California, 28.7% in New Mexico and 25.9% in Arizona. The concentration of Mexican origin population is even higher in border counties, with percentages ranging from 77-80% in metropolitan counties like Cameron and El Paso, along the eastern part of the border, and 56-77% in more agricultural counties like Yuma and Imperial, in the western reach. Estimates from the American Community Survey indicate that in 2010 about 45% of the Hispanic population in large metropolitan counties like San Diego, Pima and El Paso speak at home a language other than English, most likely Spanish, but also speaks English "very well."¹³ Language is a basic ingredient of social identity, and linguistic practices along the border reflect the hybrid nature of the region as well as the bridging role of culture. As observed by Martínez¹⁴ this density of Mexican people and culture along the border is

the foundation of the thick transborder network of human interactions and also the platform that connects the wellbeing of residents on both sides of the border through family and blood ties. Transnational ties, particularly connections occurring in the context of transborder family relations, are the vehicle for the operation of support networks, including the transfer of income, job-finding tips, business opportunities, family conviviality, common friendship, and simple human solidarity.¹⁵ All of these interactions are basic ingredients of quality of life and make the wellbeing of Mexico's border communities inextricably linked to the wellbeing of United States' border communities, and vice versa.

In sum, spatial confluence, functional articulation, institutional convergence and social connectivity give meaning to the idea of a transborder region because they are the cause of externalities, multipliers, hybridization, integration, and, in general, the material basis for employment, wealth creation, identity, collaboration, solidarity and the entire set of experiences that are unique to the people of the border.

Four Dimensions of Quality of Life

As seen above, people living in the border region face a much different set of factors affecting quality of life than the rest of the people of Mexico and the United States. The unique nature of development in this region and the need to ground any conceptualization of wellbeing in this reality require a broad definition of quality of life, such as the one proposed by Dasgupta and Weale. According to these authors, quality of life is a multidimensional and multifactorial concept that should be evaluated by looking at the constituents of well-being, as well as by measuring to what extent people have access to its determinants. Health, income, and sense of belonging are examples of constituents of quality of life; while availability of shelter, sanitation, schools, health care, public safety, and employment are its most common determinants. It should be noted, however, that quality of life depends on the combined effect of these dimensions and factors, and not on the effect of any of them acting alone. We also acknowledge that **quality of life is a dynamic construct that changes over time and across space**. However, in order to operationalize and measure quality of life, we have to see it as a static phenomenon.

In this analysis, we represent quality of life as the result of four dimensions: economic opportunity; education and culture; healthy life; and community life.

Economic opportunity refers mostly to conditions that allow individuals and families to obtain the means to satisfy basic needs like nutrition, housing, and healthcare. Education and culture

focus explicitly on aspects concerning personal development and human capital accumulation at the individual and societal level. Healthy life is a dimension representing the ability of people to live longer and healthier lives. Lastly, community life recognizes the role that man-made and natural environments, in tandem with social factors, play in creating opportunities for a better

life. The interaction and complementarity among these four dimensions are not only apparent but provide robustness to the concept of quality of life as a multidimensional phenomenon, as suggested above.

The four domains and their corresponding indicators are summarized in figure 2. Although we recognize the important role that subjective factors play in quality of life, all the indicators used in this analysis are of the objective type. There are several reasons for this. First, objective indicators are less costly to produce and much more are readily available on both sides of the border. Second, some studies have demonstrated that wellbeing and other subjective indicators of quality of life are in the causal path that connects objective indicators with happiness, the ultimate representation of quality of life.¹⁶ Finally, objective indicators are also appropriate for regular tracking and evaluation, which is essential to assess whether the different dimensions of quality of life are evolving as expected in light of relevant regional policies and plans.

In this analysis, we represent quality of life as the result of four dimensions: economic opportunity; education and culture; healthy life; and community life.

Figure 2: Domain and indicators of Quality of Life in the U.S.-Mexico Transborder Region



In the following section, we describe and analyze these indicators in order to provide an initial assessment of how the four dimensions of quality of life have evolved in the border region recently.

Economic Opportunity

Overall, the economic performance of the border region is indicated by its ability to create and maintain a high and steady number of jobs available to those residents able and willing to work in local businesses. Although the most direct benefit accrued by the local population from the job market is a secure flow of income, it is important to keep in mind that a stable supply of jobs also

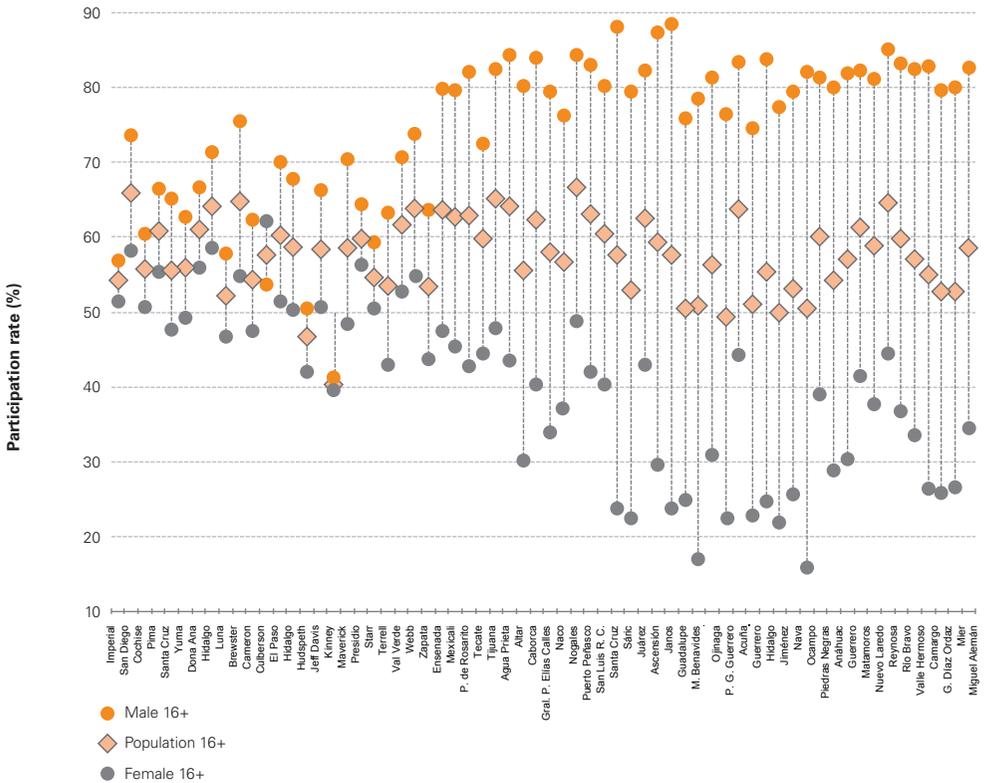
contributes to the accumulation of human capital through the development of skills and competencies. Another indirect benefit of a stable labor market is the development of a sense of belonging and self-worth among those residents able to find and maintain a job. Therefore, communities with high levels of employment are not only wealthier, but also tend to enjoy greater social cohesion and stability.

Unemployment rates on the U.S. side of the border have been chronically high, ranging from 29.7% in Imperial Valley, California to 4.4 in Culberson, Texas in 2010. The average for the region moved from 8.5% in 2000 to 11.9% in 2010, a steeper increase in the unemployment rate as compared to the United States as a whole which moved from 4.0% to 9.6% during the same period.¹⁷ In contrast, unemployment rates are comparatively lower in the Mexican side of the border, ranging from 1.0% in 2000 to 5.8% in 2010. National unemployment rates in Mexico moved from 2.6% to 5.4% in the same period.¹⁸

A key indicator of economic opportunity is the level of labor force participation, which is the proportion of the working age population that is economically active. Figure 3 shows overall and gender-specific participation rates in 2010, adjusted to a lower age limit of 16 years, for both sides of the border. As can be seen, U.S. counties had higher overall participation rates (61.7%) than Mexican municipalities (57.9%). In addition, labor force participation rates were higher for men than women in all U.S. border counties and Mexican border municipalities, although the size of the gender gap varied considerably across the border.

The largest gaps were in rural Mexican *municipios*, where the differences in rates in some instances exceeded 60%. The highest participation rates for women were recorded in highly urbanized municipalities with significant industrial activity: Tijuana, Nogales, Mexicali and Juarez. These cities have large *maquiladora* industries, which still employ a significant proportion of the female labor force in the Mexican border region. Mexican *municipios* with a large hospitality sector, like Ensenada and Playas de Rosarito, Baja California also had high participation rates for women and, thus, a relatively low gender gap. Nevertheless, the gap in these *municipios* was three times as large as the average gap estimated for U.S. border counties alone.

Figure 3: Labor Participation Rates 2010–U.S.-Mexico Border Counties and Municipalities



Sources: U.S. Census Bureau and INEGI

Overall, participation rates in border counties tend to be lower than the corresponding U.S. participation rate, reflecting lower employment opportunities.

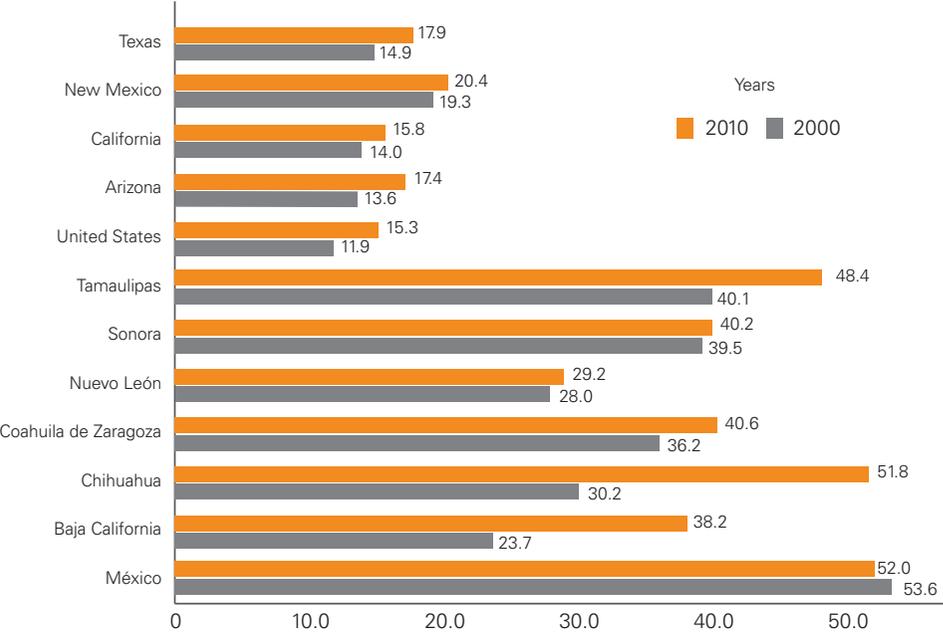
Furthermore, 2010 labor participation rates for the border as a whole were lower than the corresponding estimates for 2000, reflecting a decline in employment opportunities in the region and, consequently, higher unemployment rates in 2010.

While many studies show that money cannot be equated to happiness, monetary income is an important vehicle to achieving higher living standards and

thus greater wellbeing.¹⁹ Higher income may also improve access to education, healthcare and housing, some of the most important determinants of quality of life. Overall, economic opportunity along the border is characterized by low wages; the dominant industries in the region are services, labor-intensive manufacturing, and agriculture. Particularly on the Mexican side, manufacturing typically does not require highly skilled labor and pays relatively low wages. Furthermore, the salary gap between Mexico and the U.S. has remained unchanged during the decade as demonstrated by the fact that the compensation of Mexican workers in the manufacturing sectors was 16% of the compensation received by U.S. manufacturing workers in 2000 and 2010.²⁰

The U.S. Census Bureau uses monetary values of market priced goods and services to define poverty thresholds that are used to estimate how many households and persons fall below the poverty line. If a family's total income is less than the threshold that corresponds to its size and age profile, then the whole family and each of its members are considered in poverty. The official U.S. poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index. In 2004, Mexico started using household monetary income to define a poverty threshold similar to those estimated by the U.S. Census. Accordingly, a basket of goods and services valued at market prices is used to estimate a "wellbeing line" that is used to identify the population that lacks the necessary income to buy all of the goods and services required to fulfill its food and non-food basic needs.²¹ Though these two measures of poverty are not directly comparable, their analysis provides a good overview of the challenges faced by border communities to provide economic opportunities to their members.

Figure 4: Population below the Poverty Line (%), Border States



Sources: U.S. Census and CONEVAL

Figure 4 displays poverty levels for U.S. and Mexican border states. The national poverty levels are used as a benchmark to compare the incidence of poverty in each state and the change in percentage of population below the poverty line. In the U.S., close to 15.3% of the national population was below the poverty line in 2010; with New Mexico (20.4%), Texas (17.9%) Arizona (17.4%) and California (15.8%) above this percentage. The U.S. poverty rate in 2010 was the highest since 1993.²² On the other hand, Mexico’s poverty level was 52% in 2010, almost 2 percentage points below the level observed in 2000. All Mexican border states recorded poverty levels below the national value, though the spread of observed values is substantial, as Chihuahua’s poverty level was slightly lower than the national level and Nuevo Leon was more than 20% below.²³

Poverty data highlights what some authors have already referred to as the paradox of development, branding the U.S.-Mexico border region the place where the poorer of the first world meet the wealthier of the developing world.²⁴

Education and Culture

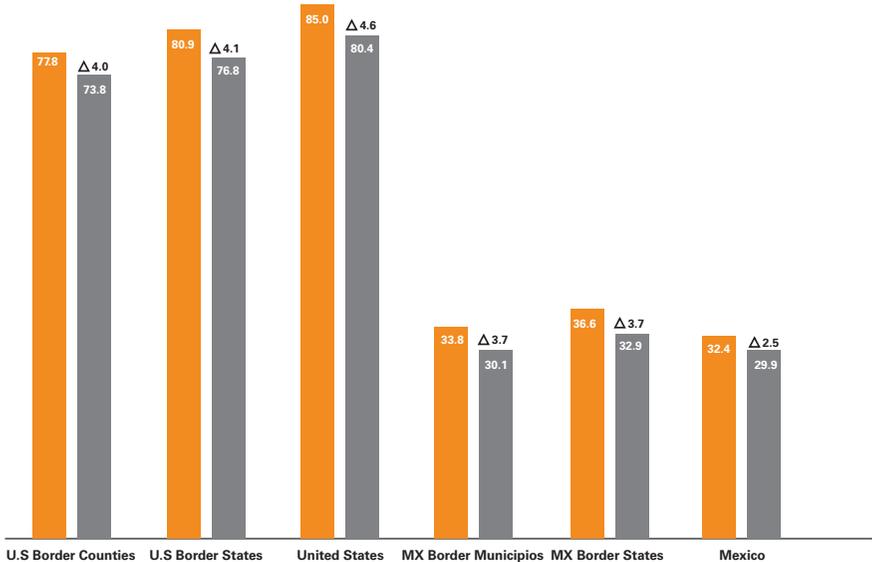
The educational and cultural services that a region offers to its residents are critical for wellbeing because they provide individuals with the knowledge, information, skills and experiences needed to participate successfully in social and economic life. As indicated by Anderson and Gerber, education furnishes individuals with the competencies needed to live a healthier life, engage in civic activities, and benefit more from economic opportunities.²⁵ For example, the OECD reports that men with college degrees are 18% more likely to find jobs than those with only a high school diploma and that their lifetime earnings improve with schooling. The impact of education on job opportunities is even higher among women in OECD countries.²⁶ Likewise, cultural services, including the different expressions of art and leisure activities, also play an important role in quality of life because they promote creativity and contribute to the development of a sense of belonging by engaging individuals with their communities.

While the Mexican government has made substantial investments in its educational system, Mexico is still at the bottom of the OECD rankings and is below several Latin American countries of similar income in terms of school attendance and educational attainment.²⁷ In 2012, Mexico amended its constitution to make high school education mandatory; in the U.S. this education level has been standard since the 1950s when high schools became common and provided free education to any student who chose to stay in school for 12 years.²⁸ Consequently, there is a historical gap in high school education enrollment and graduation rates between Mexico and the U.S. This gap extends to other indicators of educational attainment, and it is quite apparent throughout the border region.

For example, in 2010 an estimated 55.1% of the population aged 25 and older of the 24 U.S. border counties had earned the equivalent of a high-school

degree or better. Residents of large metropolitan counties had slightly higher levels of educational attainment; at least 62% of residents of San Diego and Pima had successfully completed at least high school, compared with 45% of non-metropolitan counties. In contrast, 33.8% of the same cohort living in Mexican border municipalities had completed high school. Larger metropolitan municipalities like Mexicali (39.9%), Nogales (38.1%), Tijuana (35.9%) and Reynosa (35.4%) had higher rates of their adult population that had completed at least high school. On the other hand, only 5 out of 24 U.S. border counties had populations aged 25 and older in which the percentage of members that had completed at least high school was fewer than 40%.

Figure 5: Population aged 25 years and over with at least a high school education (%)



Sources: U.S. Census and INEGI

As shown in figure 5, the difference between border counties and municipalities relative to their corresponding states slightly favor the latter ones, but the data replicate the same asymmetric pattern described above. Overall, border states have larger percentages of residents with high school education than

border counties and *municipios*, although Mexican border states have significantly lower attainment levels in high school education than their U.S. counterparts.

In addition to education, human capital formation is also influenced by the quantity and quality of the cultural services offered by a region to its residents. Cultural services encompass programs and activities dedicated to enriching the lives of the local population by providing opportunities to experience the arts, knowledge, traditions, ecology, and other essential cultural experiences. To measure the cultural offerings in the border region we looked at the **number**

of cultural workers as well as the

number of people employed in establishments dedicated to the distribution of information and cultural products relative to the region's general population. The first indicator was equal to **65 cultural workers per 10,000 residents in U.S. border counties, while the corresponding value in Mexican municipalities was 15.9 cultural workers per 10,000 residents.** Similarly, the second indicator showed 84 people working in the distribution of information and cultural products industry per 10,000 residents in U.S. border counties versus 37.5 in Mexican municipalities. In relation to their corresponding states, border counties are more likely to be worse while Mexican municipalities tend to be slightly better.

Overall, the border region has made significant progress in improving many of the key indicators in education and culture during the last decade. However, for the longer term, it will be essential to expand resource allocation to education

Overall, the border region has made significant progress in improving many of the key indicators in education and culture during the last decade. However, for the longer term, it will be essential to expand resource allocation to education and cultural services on both sides of the border to catch up and eliminate chronic deficits in capacity and performance.

and cultural services on both sides of the border to catch up and eliminate chronic deficits in capacity and performance. Closing the gap between Mexico and the U.S. will require an additional effort to use existing budgets and human resources with greater efficiency, innovation and accountability.

Healthy Life

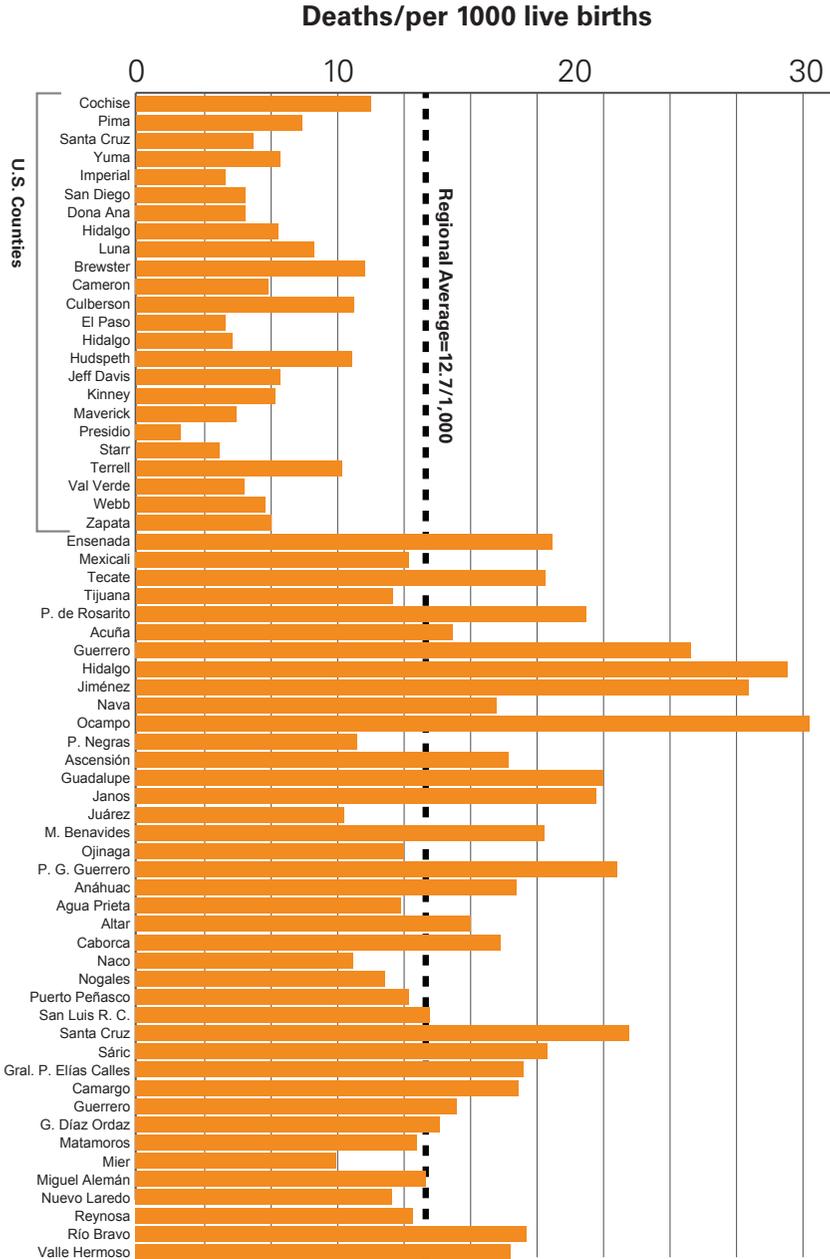
Obtaining services to detect and treat health problems along with acquiring preventive care and general health information are all issues related to the ability of populations to live a healthy life. It is well known that the availability of health insurance, the most important barrier to accessing health care services and information, varies with income and place. In comparison to national standards, residents of U.S. border counties are less likely to have adequate access to health care due to their inability to attain health insurance, either through employment or personal means. In 2010, the percentage of uninsured residents in border counties averaged 32.2%, while this percentage in the U.S. was 16.3%. The higher rates of uninsured residents in border counties are mainly because of the steep opportunity cost faced by low income families in areas with relatively high unemployment.²⁹ Being much more industrialized and urbanized than the rest of Mexico, border municipalities afford comparatively high employment levels to their residents and thereby access to employer-based health services through the social security system. In 2010, the percentage of uninsured residents in Mexican border municipalities averaged 34.6%, while the uninsured population reached 40% nationally. For the most part, uncovered populations on both sides of the border consist of impoverished and marginalized residents due to a steady inflow of migrants looking for opportunities in the region.

An additional factor impacting access to health care in the border region is the lack of primary healthcare providers. Estimates by the U.S. and Mexican censuses on employment in establishments providing healthcare and social assistance for individuals give a glimpse of the relative availability of this critical human resource in the region. On average, border counties had 384 health workers per 10,000 residents in 2007, with the ratio being substantially lower in

counties such as Santa Cruz, Arizona (212); Imperial, California (248); Hidalgo, New Mexico (257); and Hudspeth (27) and Kinney (26) in Texas. Most of these counties are federally designated Health Professions Shortage Areas (HPSA) with high scores in their priority to receive assistance to recruit medical personnel. Among Mexican municipalities, estimates indicate these ratios were significantly lower, reaching on average 52 health workers per 10,000 residents in 2007.

In order to further explore the implications of access to health services and resources, it is necessary to look at one of the most widely used indicators of the overall health status of a community. Figure 6 shows estimates of **infant mortality rates for U.S. border counties and Mexican *municipios*** in 2005. Infant mortality rates in border counties show a significant variability, with lows near 2 infant deaths per 1,000 births and highs near 10.5 infant deaths per 1,000 births. Although a definite pattern cannot be discerned from these numbers, higher infant mortality rates tend to concentrate in the most rural counties, such as Luna, New Mexico; Cochise, Arizona and Brewster, Hudspeth and Culberson in Texas. It has to be observed, however, that infant mortality rates in U.S. border counties tend to be lower than the U.S. national rate, and many border counties are well beyond the Healthy People 2020 target of 6 infant deaths per 1,000 live births.³⁰ In contrast, Mexican border municipalities recorded rates ranging from 9 to 30 infant deaths per 1,000 births in 2005. The average rate for the 40 border municipalities was 16.4 infant deaths per 1,000 live births, about 2.5 times higher than the average on the U.S. side of the border (6.4 /1000). Infant mortality rates also tend to be higher in those municipalities with larger rural populations, where primary health care is less likely to be accessible or of good quality.

**Figure 6: Infant Mortality Rates
(Deaths per 1,000 live births in 2005)**



Sources: U.S. Census and INEGI

While the indicators used in this section cannot present a complete picture of health and health care in the whole region, they are indicative of the range of conditions border inhabitants must face in seeking a healthy life. For the most part, these conditions can be reduced to the fact that health services and resources are scant in many border communities, limiting the choices individuals can make to preserve or improve physical and mental wellbeing. This contributes to well-known health disparities that affect populations that are relatively vulnerable to illness due to their income, ethnicity, age, gender or isolation. It is not a stretch to say that these disparities transcend the border, leaving populations on the Mexican side most vulnerable to poor health as indicated by stubborn differentials in health outcomes that characterize Mexican border communities vis-à-vis U.S. border communities.

Community Life

Quality of life is directly linked with the ability of a community to afford its members with the conditions and opportunities for social interaction, collective identity, and a sense of belonging. The frequency of social contacts within the community, for example, is not only correlated with the exchange of ideas that might evolve into shared understandings of local issues but also with the potential creation of bonds within the community. Constant social interactions require the presence of venues like parks or other communal spaces where local people can meet, feeling secure and stress-free. Using this notion as a basis, this section explores some indicators of the extent to which border communities foster individual and collective wellbeing through social infrastructure, a sense of place and community safety.

The first of these indicators is the size of the local nonprofit sector represented by social advocacy institutions, unions, foundations, churches, and other community organizations promoting social and political causes. Though direct statistics about this sector are not readily available, a way to approximate its size is by calculating the ratio of total employment in religious, grantmaking, civic, professional, and similar organizations to the total population in each border municipality.³¹ A high ratio will be indicative of an extensive social

infrastructure in the community available to provide support or promote the interest of local residents. According to the census, in 2007 there were a total of 43,308 positions in the non-profit sector of the U.S. border counties, with an average of 1,805 employees per county. Based on these numbers and considering the county population in 2010, the ratio of non-profit employees to population was **59.3 workers per 10,000 residents**. In contrast, Mexican *municipios* recorded a total of 5,154 employees in non-profit establishments in 2009, resulting in an average of 129 employees per municipality. As a result, the ratio of employment to population is significantly lower on the Mexican side than in the U.S., reaching scarcely **7.1 non-profit workers per 10,000** residents. While this indicator fails to capture the informal nature of many non-profit endeavors on both sides of the border, but especially in Mexico, it gives a good idea of how developed and large they are. It is interesting to note that although the ratio of non-profit employees to population tends to be high in large metropolitan municipalities like San Diego (80.5), Pima (74.3), El Paso (41.9) or Mexicali (6.3), the highest ratios are found in smaller counties or *municipios* such as Jeff Davis (119.6), Terrell (101.6), Gustavo Diaz Ordaz (31.1) or General Plutarco Elias Calles (28.1)

Another indicator of collective wellbeing is the size and diversity of leisure and hospitality services available in the community. The availability of these services in the community can be estimated by looking at the establishments that either provide services to meet varied cultural, entertainment, and recreational needs of local residents and visitors, including live performances, events, or exhibits of historical, cultural, or educational interest or provide services or facilities that enable people to pursue amusement, hobby, and leisure-time interests. As with the previous indicator, a ratio of leisure and hospitality jobs to local population can be estimated using census data. Assuming that higher ratios are correlated with better quality of life, wellbeing tends to be higher in U.S. counties than in Mexican municipalities. In 2007, the ratio of leisure and hospitality jobs to population on the U.S. side of the border was 64.4 per 10,000 residents compared to 15.9 per 10,000 on the Mexican side. Although large metropolitan counties like San Diego (102) and Pima (75) reported above-average ratios, not all large U.S. counties shared this characteristic. In fact, El Paso

(22), Hidalgo (19), and Webb (28) in Texas had ratios comparable in magnitude to those observed in Tijuana (26), Mexicali (19) and Ciudad Juarez (16).

Quality of Life Index

In this section, all the prior indicators are aggregated into a Quality of Life Index (QOL) created to provide a clearer image of this complex concept. Indices like these are frequently used to monitor social progress and trends over time and space. Aggregated indices are also used to compare outcomes within groups of nations or sub-national units as well as to examine potential connections between changing conditions, human behavior and policy choices. The QOL Index aims to provide compact and targeted information for management and policy development pertaining to border counties and municipalities, as well as highlighting existing complementarities and gaps.³²

Table 2 presents the estimated values of the 2000 and 2010 QOL index and the rankings of counties and *municipios* based on indicators in the four dimensions of quality of life we explored in the previous section. It is important to note that a rank of one represents the best performing county/municipality, while a rank of 64 represents the worst performing county/municipality. An examination of the rankings indicates that in 2010 the five best performing counties/municipalities were San Diego, California (1), Pima, Arizona (2), Brewster, Texas (3), Jeff Davis, Texas (4), and Cochise, Arizona (5). The five worst performing counties/municipalities were Manuel Benavidez, Chihuahua (64), Jimenez, Coahuila, (63), Ocampo, Chihuahua (62), Santa Cruz, Sonora (61) and Sáric, Sonora (60). The grouping at the top of the ranking did not change much between 2000 and 2010, though the drop of El Paso, which passed from 4th to 9th place during the decade, is noticeable. At the bottom, the most striking change is the upward movement of Hidalgo, Coahuila, which jumped from 63rd to 52nd place. While El Paso, relative to other border counties and municipalities, did not make significant improvement in any dimension of quality of life included in the index, Hidalgo, Coahuila outperformed most municipalities in the indicators of economic opportunity and community life. Better performance than the majority of other counties and municipalities is indicated by the double plus sign in the last four columns of table 2.

Table 2: Quality of Life Ranking and Dimensions, 2000-2010.

County/ Municipality	State	2010		2000		Change in Dimensions of Quality of Life*			
		Rank	Score	Rank	Score	Economic Opportunity	Education and Culture	Healthy Life	Community Life
San Diego	California	1	0.85	1	0.91	+			
Pima	Arizona	2	0.81	2	0.84				
Brewster	Texas	3	0.74	3	0.74				
Jeff Davis	Texas	4	0.73	5	0.69		++		+
Cochise	Arizona	5	0.69	6	0.67		+		
Yuma	Arizona	6	0.69	10	0.57	++	+		
Val Verde	Texas	7	0.68	9	0.58	+	++		
Dona Ana	New Mex- ico	8	0.68	7	0.63			+	
El Paso	Texas	9	0.67	4	0.71				
Maverick	Texas	10	0.65	21	0.44	+	++	++	++
Santa Cruz	Arizona	11	0.63	11	0.55		+	+	
Cameron	Texas	12	0.62	8	0.61				
Presidio	Texas	13	0.62	20	0.45		++	++	
Hidalgo	Texas	14	0.61	13	0.53	++			
Webb	Texas	15	0.61	15	0.51	++			++
Imperial	California	16	0.60	17	0.49	+		+	
Culberson	Texas	17	0.59	14	0.52		++		++
Kinney	Texas	18	0.59	18	0.47		++	++	+
Terrell	Texas	19	0.58	22	0.42		++	+	++
Hidalgo	New Mex- ico	20	0.57	12	0.53			+	+
Starr	Texas	21	0.57	23	0.39	++	+	++	
Luna	New Mex- ico	22	0.54	16	0.51	+		+	
Tijuana	B. California	23	0.51	25	0.37	++	+	++	+
Zapata	Texas	24	0.50	24	0.38	+	+	+	++
Mexicali	B. California	25	0.47	27	0.35		++	+	+
Hudspeth	Texas	26	0.47	19	0.45			++	+

County/ Municipality	State	2010		2000		Change in Dimensions of Quality of Life*			
		Rank	Score	Rank	Score	Economic Opportunity	Education and Culture	Healthy Life	Community Life
Nogales	Sonora	27	0.45	33	0.29	++	++	+	
Tecate	B. California	28	0.45	28	0.31	+	++	++	
Piedras Negras	Coahuila	29	0.45	32	0.30	++	+		++
Juárez	Chihuahua	30	0.44	26	0.35			++	+
Reynosa	Tamaulipas	31	0.44	30	0.31	++	+		+
Ensenada	B. California	32	0.44	29	0.31	+	++	+	
Playas de Rosarito	B. California	33	0.42	37	0.28	++	+		
San Luis Río Colorado	Sonora	34	0.41	35	0.28	+	+	+	
Nuevo Laredo	Tamaulipas	35	0.40	34	0.29	+	+	+	
Matamoros	Tamaulipas	36	0.40	36	0.28	++	+		
Puerto Peñasco	Sonora	37	0.40	44	0.24	+	++	+	+
Acuña	Coahuila	38	0.39	42	0.24	+	++		++
Miguel Alemán	Tamaulipas	39	0.39	31	0.31	++		+	
Agua Prieta	Sonora	40	0.38	38	0.27	++		++	
Caborca	Sonora	41	0.37	40	0.25	++	++		
Mier	Tamaulipas	42	0.37	39	0.26			++	+
Naco	Sonora	43	0.36	45	0.24		+	++	++
Gustavo Díaz Ordaz	Tamaulipas	44	0.33	43	0.24		+	++	++
Valle Hermoso	Tamaulipas	45	0.31	51	0.20	+		++	
Gral. P. Elías Calles	Sonora	46	0.31	41	0.25		++	+	
Río Bravo	Tamaulipas	47	0.31	49	0.21	+			++
Ojinaga	Chihuahua	48	0.30	47	0.22				++
Anáhuac	Nuevo León	49	0.30	56	0.16	++	++		
Nava	Coahuila	50	0.30	50	0.21	+	+		++
Camargo	Tamaulipas	51	0.29	46	0.22				++
Hidalgo	Coahuila	52	0.25	63	0.09	++			++

County/ Municipality	State	2010		2000		Change in Dimensions of Quality of Life*			
		Rank	Score	Rank	Score	Economic Opportunity	Education and Culture	Healthy Life	Community Life
Ascensión	Chihuahua	53	0.25	55	0.16			+	++
Altar	Sonora	54	0.25	54	0.17	+	+	++	
Guerrero	Tamaulipas	55	0.23	48	0.21			++	
Guadalupe	Chihuahua	56	0.22	53	0.18				+
Praxedis G. Guerrero	Chihuahua	57	0.22	52	0.19				+
Guerrero	Coahuila	58	0.19	61	0.12	++			+
Janos	Chihuahua	59	0.18	59	0.14				++
Sáric	Sonora	60	0.17	64	0.08			++	
Santa Cruz	Sonora	61	0.15	57	0.14				
Ocampo	Coahuila	62	0.14	58	0.14				+
Jiménez	Coahuila	63	0.13	60	0.12				+
Manuel Benavides	Chihuahua	64	0.13	62	0.11				+

* Above 75 percentile (++); above the median (+).

Other counties that experienced substantial upward shifts in their ranking were Maverick and Presidio in Texas, which performed very well in indicators of education and culture, as well as in healthy life. Yuma, Arizona also showed a substantial jump in its ranking due mainly to improvements in economic opportunities and education and culture. On the Mexican side, Puerto Peñasco; Nogales, Sonora; and Anahuac, Nuevo Leon also moved upward, although for different reasons. In the case of these three municipalities, improvement resulted from good performance in all dimensions but particularly in economic opportunity and education and culture indicators.

In the aggregate, large metropolitan municipalities are more likely to offer better economic opportunities than smaller ones, yet this is truer for the Mexican side than for the U.S. side of the border. In fact, among U.S. border counties, there are a few small rural jurisdictions with high standings because they perform as well as larger counties in terms of labor force and poverty indicators.

This is clearly the case of Brewster and Jeff Davis in Texas, whose natural-resource based economies have created a more stable regional economy with steady employment and income levels in the Big Bend area. Large municipalities such as Tijuana, Mexicali, Juarez or Nogales have a better ranking among Mexican *municipios* because of the central role their economies play in the economic interaction between Mexico and the U.S. and because of their large share of their respective regional markets. The index also shows a substantial economic gap between Mexican and U.S. municipalities, as indicated by the fact that only two small rural counties in Texas produced scores comparable to those of larger municipalities like Tijuana, Juarez and Nogales. This gap stems mainly from the much higher poverty levels in Mexico along with the substantial disparity in female and male labor participation rates that were observed before.

A similar pattern is observable in the area of education and culture, although the divide between metropolitan and rural municipalities is clearly more intense irrespective of the side of the border. This is understandable since large metropolitan areas in both countries are normally the seat of regional universities and home to larger school districts, which is reflected in higher educator to population, greater educational attainment levels and a broader range of cultural services. In fact, the overlap between both sides of the border is the highest in this particular dimension, as indicated by the significant number of counties with scores below those of the best ranked Mexican *municipios*.

In the area of health, the indicators used to measure healthy life reflect a greater variability. First, counties and municipalities of intermediate size are among those jurisdictions with better rankings, including Starr, Maverick and Valverde in Texas along with Piedras Negras, Coahuila; Mier, Tamaulipas and Naco, Sonora. For the most part, this reflects the influence of mid-size population centers where the availability of medical care is normally adequate and health hazards resulting from long commutes and traffic congestion are moderate due to the size of the cities in these jurisdictions. Secondly, although the overlap between health indicators on both sides of the border is minimal in comparison with the other dimensions included in the index, the scores of Mexican *municipios* tend to be clustered around values that are closer to the scores of U.S. counties.

This indicates a less intense disparity between both sides of the border reflecting the quasi-universal access and institutionalized character of medical care in Mexico.

Large metropolitan municipalities are more likely to offer better economic opportunities than smaller ones, yet this is truer for the Mexican side than for the U.S. side of the border.

Finally, community life is the dimension where the combined effect of the indicators results in the lowest variability within the region. Yet, U.S. counties tend to cluster in the highest segment of the ranking and Mexican *municipios* in the lowest section. The overlap between U.S. counties and Mexican municipalities in this dimension is minimal due to the high incidence of homicides south of the border, particularly in the states of Chihuahua and Tamaulipas. In contrast, data show that that this type of crime along the U.S. side of the international boundary is very low, even for national and statewide standards, and border counties as a whole did

not experience an increase in violent crimes between 2000 and 2010.

Conclusions and Policy Recommendations

This chapter provides a snapshot of the border region's quality of life. Quality of life was measured and evaluated using accepted indicators and procedures, relying on data from publicly available sources in Mexico and the United States. The data and the analysis presented in this chapter offer several insights that are relevant to policymakers, practitioners and researchers alike.

The quality of life on each side of the border is intimately intertwined with the quality of life on the other side due to historical, social and geographical factors that connect the people and places in this region in a way that is unique. It is critical that policymakers on both sides of the border acknowledge this fact and make it an integral part of the plans and programs targeting economic opportunity, health, education, culture, and community life—that is, the quality of life—of the people living in the border region.

The state of quality of life in the region is one of asymmetry and change. Between 2000 and 2010, the quality of life gap across the border became slightly less marked even as development remained asymmetrical. Mexican communities occupy the lower half of the scale for most indicators of wellbeing. During the same period, and despite several new challenges, the overall wellbeing of the region has increased. Still, **there is much catch-up to do to** close the gap and raise the quality of life for all residents in the transborder region. This includes strengthening the emphasis on equity and the elimination of disparities that disproportionately affect the educational, economic and health opportunities of the poor, ethnic minorities and other disfranchised social groups. A greater focus on quality of life would provide the opportunity to reframe the entire management strategy implemented in the border region in recent decades, crafting a new discourse, one based as much on human development as it is on trade, competitiveness and security.

Lasting progress in improving quality of life can only result from the combination of independent national policies and coordinated and collaborative cross-border efforts. On the Mexican side, several key challenges stand out, including crime prevention, the expansion of educational opportunities for youth and the elimination of barriers that limit greater participation of women in economic life. On the U.S. side, regional policies and plans need to target reduction of infant mortality rates and poverty, which have been chronically substandard in border counties. The two countries, including all levels of government, civic and private sector leaders, must work together to identify areas where public and private resources can be invested in more effective and innovative ways. By introducing complementary border development strategies, the investments of each country can be mutually reinforcing, creating a virtuous circle of development and rising living standards.

The options at hand are broad in range. The two countries could benefit, for example, from greatly strengthening exchange programs that allow Mexican students to pursue graduate studies in the U.S. and vice versa. Such programs can contribute significantly to the formation of specialized human resources desperately needed in Mexico, while strengthening intercultural competencies

and human capital in the whole transborder region. Public-private partnerships offer another opportunity, as shown by programs aiming to eliminate chronic cross-border gaps in health or poverty, such as the binational health councils, which combine local expertise and resources to fight communicable and chronic diseases resulting from social disparities.

Much remains to be done to flesh out a fully comprehensive assessment and measurement of quality of life in the U.S.-Mexico transborder region. **First, further examination of our initial set of dimensions and indicators is needed, to explore their validity in the particular context of the U.S.-Mexico border and for different subpopulations and geographies within this region.** Further work should also be undertaken to test and verify the value of this initial set of indicators in consideration of the aim of describing and tracking quality of life changes over time and across the border. **Second, the selection of these indicators was based largely on the availability of data. There are certainly other possible indicators of quality of life worthy of exploration.**

Lastly, the goal of this report and the Quality of Life Index is to provide border communities and policy-makers with a trustworthy metric of complementarities and development gaps, offering clear, credible and systematic reporting on progress toward higher wellbeing and lesser disparities across the region. By taking steps toward the development of reliable indicators, this chapter seeks to provide policymakers the tools they need to take action in support of the millions of residents of the border region. In order to move from evaluation and measurement into coordinated and effective action, it will be vital to work in partnership with a broad array of Mexican and U.S. organizations and institutions working to enhance the wellbeing of border communities.

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CHAPTER 2: THE STATE OF TRADE, COMPETITIVENESS AND ECONOMIC WELL-BEING IN THE U.S.-MEXICO BORDER REGION

Christopher E. Wilson and Erik Lee

EXECUTIVE SUMMARY

Commerce between the United States and Mexico is one of the great—yet underappreciated—success stories of the global economy. In fact, in 2011 U.S.-Mexico goods and services trade reached the major milestone of one-half trillion dollars with virtually no recognition.¹ The United States is Mexico's top trading partner, and Mexico—which has gained macroeconomic stability and expanded its middle class over the last two decades—is the United States' second largest export market and third largest trading partner. Seventy percent of bilateral commerce crosses the border via trucks, meaning the border region is literally where “the rubber hits the road” for bilateral relations. This also means that not only California and Baja California, but also Michigan and Michoacán, all have a major stake in efficient and secure border management.

Unfortunately, the infrastructure and capacity of the ports of entry to process goods and individuals entering the United States has not kept pace with the expansion of bilateral trade or the population growth of the border region. Instead, the need for greater border security following the terrorist attacks of 9/11 led to a thickening of the border, dividing the twin cities that characterize the region and adding costly, long and unpredictable wait times for commercial and personal crossers alike. Congestion acts as a drag on the competitiveness of the region and of the United States and Mexico in their entirety. Solutions are needed that strengthen both border security and efficiency at the same time. The development of the 21st Century Border initiative by the Obama and Calderón administrations has yielded some advances in this direction, but the efforts need to be redoubled.

Moderate investments to **update infrastructure** and to fully staff the ports of entry are certainly needed, as long lines and overworked staff promote neither efficiency nor security. But in a time of tight federal budgets, asking for more resources cannot be the only answer. Strategic efforts that do more with less, improving efficiency and reducing congestion, are also needed. Trusted traveler and shipper programs (i.e. SENTRI, FAST, C-TPAT, Global Entry) allow vetted, low-risk individuals and shipments expedited passage across the border. Improving these programs and significantly expanding enrollment could increase throughput with minimal investments in infrastructure and staffing—all while strengthening security by giving border officials more time to focus on unknown and potentially dangerous individuals and shipments.

The border region tends to organize itself in terms of north-south trade corridors as a natural result of the cross-border relationships that facilitate the flow of goods. This phenomenon manifests itself in the development of everything from interest groups to regional border master plans. Without a doubt, economic development and competitiveness in the region is anything but uniform, ranging from the great wealth of San Diego to the pockets of severe poverty in the Rio Grande Valley, from the aerospace cluster in Baja California to the vast deserts of Sonora and Coahuila. Despite this tremendous diversity and even a fair bit of competition to pull trade flows into one's own region, border communities have more than enough common interests to warrant border-wide planning, stakeholder organization, and the sharing of best practices. **Recently, crime and violence in certain Mexican border communities has dominated the national perceptions of the region in both the United States and Mexico.** To the extent that the border communities and border states speak with a unified voice, they will have a better opportunity to put forth their own narrative about the region and to call for appropriate revisions to national border policies.

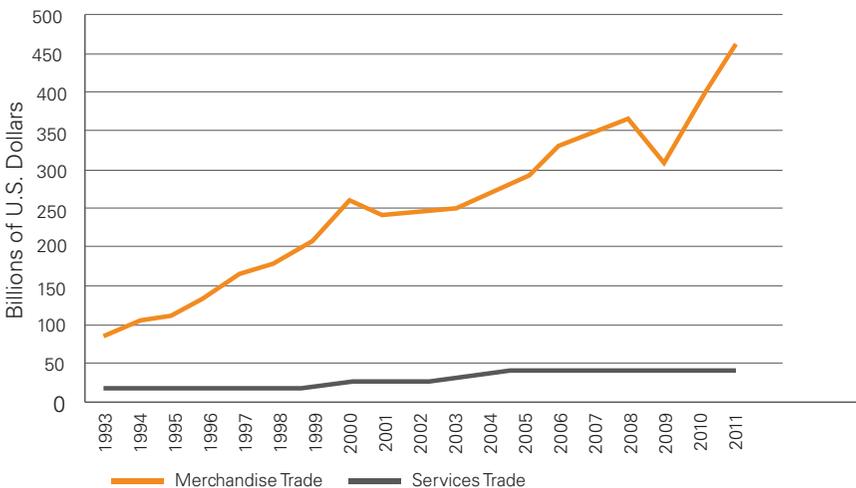
ECONOMICS

The National Economic Impact of Bilateral Trade and Border Management

Commerce between the United States and Mexico is one of the great yet highly underappreciated success stories of the global economy. The United States is Mexico's top trading partner, and Mexico—which has made enormous strides in its macroeconomic picture in the last two decades—is the United States' third-ranked partner in terms of total trade.

The economic vitality of the U.S.-Mexico border region—which includes manufacturing, infrastructure, human capital and tourism, among other elements—is a key part of this overall economic success. With more than a billion dollars of commercial traffic crossing the border each day, it is literally at the U.S.-Mexico border region where the rubber hits the road in terms of this expanded regional trade. This is because more than 70% of total binational commerce passes through the border region via trucks. This already massive truck traffic is expected to increase significantly in the coming decades (see Figure 2 below).

Figure 1: U.S.-Mexico Bilateral Trade in Goods and Services, 1993-2011



Source: U.S. Department of Commerce, Bureau of Economic Analysis and Census Bureau

Since the implementation of the North American Free Trade Agreement in 1994, total trade between the two countries has more than quintupled, and goods and services trade is now at a half trillion dollars per year. An estimated six million U.S. jobs and probably even more Mexican jobs depend on bilateral trade.²

The six Mexican and four U.S. border states have especially close bilateral economic ties, but what is often unappreciated is that this economic value extends far beyond the border region. Mexico, for example, is the top buyer of exports from states as far away as New Hampshire (mostly computers and electronics). In fact, Mexico is the first or second most important export market for twenty-one states from Colorado to Ohio, and twenty U.S. states sell more than a billion dollars' worth of goods to Mexico each year. The United States is an even more important market for Mexican exports. Seventy-nine percent of Mexican exports are sold to the United States, including products produced in the border region and throughout the country.³ Crude oil, for example, which is mostly produced in Mexico's Gulf Coast states, is the top single export to the United States, but automobiles and auto-parts, which make up an even greater

The six Mexican and four U.S. border states have especially close bilateral economic ties, but what is often unappreciated is that this economic value extends far beyond the border region.

share of exports when taken together, are mainly made in the center and north of the country.⁴

The *quantity* of U.S.-Mexico trade is impressive, but its *quality* makes it unique. The United States and Mexico do not just sell goods to one another, they actually work together to manufacture them. Through a process known as production sharing, materials and parts often cross back and forth between factories on each side of the border as a final product is made and assembled. As a result, U.S.

imports from Mexico contain, on average, 40 percent U.S. content, and Mexico's imports from the U.S. also have a high level of Mexican content.⁵

This system of joint production has two important consequences. First, it means that our economies are profoundly linked. We tend to experience growth and recession together, and productivity gains or losses on one side of the border generally cause a corresponding gain or loss in competitiveness on the other side as well. In sum, we will largely succeed or fail together and must therefore join forces to increase the competitiveness of the region. Second, the fact that goods often cross the border several times as they are being produced creates a multiplier effect for gains and losses in border efficiency. Whereas goods from China only go through customs and inspection once as they enter the U.S. or Mexico, products built by regional manufacturers bear the costs of long and unpredictable border wait times and significant customs requirements each time they cross the U.S.-Mexico border.

The fact that goods often cross the border several times as they are being produced creates a multiplier effect for gains and losses in border efficiency.

Leading industrial sectors in U.S.-Mexico trade include automobiles, aerospace, home appliances, and medical devices, to name but a few. We often find extremely high-skilled labor involved in complex aspects of U.S.-Mexico trade, including custom parts, metal work and products requiring skilled labor. These processes often link designers, developers, raw materials producers and parts manufacturers in the United States to high skilled labor, engineers, and plant managers in Mexico. While in truth both countries participate in all parts of the supply chain depending on the product, these are some broad characteristics that often hold true for which parts of the manufacturing process each country specializes in.

In addition to manufactured goods, agricultural products also flow between the two countries. This includes U.S. exports of food products (grains and processed foods) from states such as South Dakota, Nebraska, and Iowa, as

well as Mexican fruit and vegetable exports from key states such as Sinaloa and Michoacán.

As a final point to introduce this macro view of U.S.-Mexico trade, it must be emphasized that this trade relationship requires major infrastructure to function effectively. The largest trade corridor, often referred to as the NASCO corridor, links central and eastern Mexico to Texas, the American Midwest, Northeast, and Ontario, utilizing the key Laredo-Nuevo Laredo ports of entry (POEs). Other important trade arteries include the CANAMEX Corridor, which connects western Mexico to the intermountain United States and Canadian province of Alberta, as well as the shorter but high-volume I-5 corridor connecting California to Baja California. As the economies of both the U.S. and Mexico grow, it is likely that this network of freight transportation infrastructure—and the land ports of entry that serve as nodes in this network—will experience added stress (see Figure 2).

**Figure 2: Projected Truck Flows for 2020
(total number of trucks per year)**



Source: Mexican Ministry of Transportation and Communications (SCT), 2005

Tourism is another key economic driver for the region. Mexico is the number one foreign destination for U.S. tourists, and Mexican tourists comprise the second largest group of foreign visits to the United States each year (see Table 1 below). Statistics on Mexican tourist spending in the U.S. are incomplete because of the heavy usage of U.S. bank cards and cash by Mexican tourists, thereby making statistical analysis of this group of tourists particularly challenging. Yet even with this incomplete picture, Mexican tourist spending ranks fourth, according to U.S. Department of Commerce statistics from 2010.

Table 1: Top Sources of Tourism and International Spending for the United States, 2010

Country	Arrivals (millions)	Rank	Spending (billions of USD)	Rank
Canada	19.96	1	20.8	1
Mexico	13.47	2	8.7	4
United Kingdom	3.85	3	11.6	3
Japan	3.39	4	14.6	2
Germany	1.73	5	5.8	6
France	1.34	6	4.1	8
Brazil	1.2	7	5.9	5

Source: U.S. Department of Commerce, Office of Travel and Tourism Industries

The large majority (85%) of Mexican arrivals to the U.S. occur at the land ports of entry along our shared border. These tourists have a significant economic impact upon the communities they visit and the states that receive sales and other taxes they pay. To take one example, according to a study by the Univer-

sity of Arizona on Mexican visitors to Arizona, in 2007-08 Mexican visitors spent \$2.69 billion in the state of Arizona, generating 23,400 direct jobs and 7,000 indirect jobs in the state.

It is the land ports of entry, then, that play the pivotal role in facilitating commercial exchange between the United States and Mexico. The health of both the national economies and the more local border-specific economies rests upon the relative health or weakness of these gateways.

Managing the Land Ports of Entry: Increasing Capacity to Ease Congestion

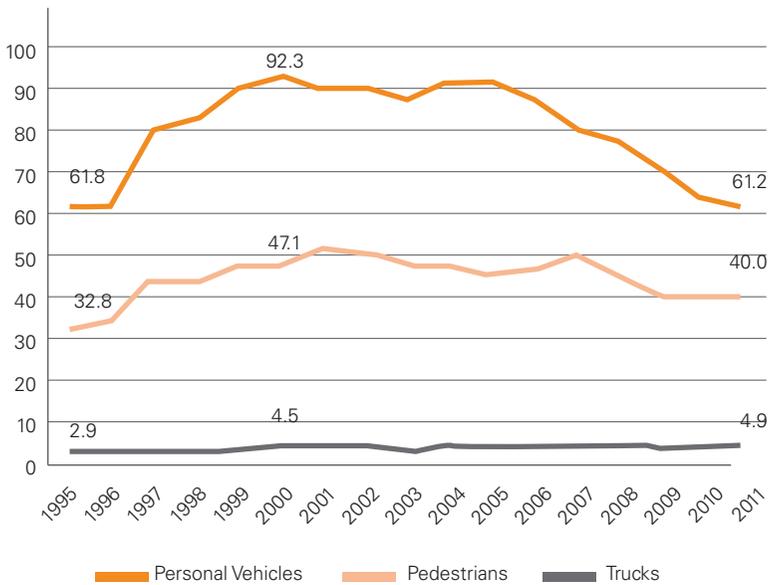
Two major events have transformed the dynamics of bilateral trade and border management over the past few decades, and an important third one may be un-

Long and unpredictable wait times at the POEs are costing the United States and Mexican economies many billions of dollars each year.

derway. The implementation of the North American Free Trade Agreement (NAFTA) in 1994 eliminated most tariffs and caused bilateral trade to skyrocket. Merchandise trade has more than quintupled since NAFTA was put in place, but its growth has not been entirely steady. After the terrorist attacks of 9/11 and the accession of China to the WTO in 2001, regional trade and manufacturing sputtered. The need for increased vigilance at the U.S.

borders came at a cost for regional manufacturers and border communities.⁶ Longer and unpredictable wait times at the border cut away at the competitiveness of regional industries and many U.S. and Mexican factories were offshored to Asia.⁷ Whereas bilateral trade had grown at a rate of 17 percent per year from 1993-2000, it only grew 4.5 percent per year from 2000-2008.

Figure 3: Northbound Port-of-Entry Border Crossers, 1995 – 2011 (millions)



Source: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, based on data from the Department of Homeland Security, U.S. Customs and Border Protection, Office of Field Operations, 2012.

The recent economic crisis has drawn attention to the serious need for efforts to increase the competitiveness of regional industry that could lead to a renewed emphasis on the trade facilitation portion of the Customs and Border Protection mission. The integrated nature of the North American manufacturing sector makes eliminating border congestion an important way to enhance regional competitiveness. The global economic crisis forced manufacturers to look for ways to cut costs. After taking into consideration factors such as rising fuel costs, increasing wages in China and the ability to automate an ever greater portion of the production process, many American companies decided to nearshore factories to Mexico or reshore them to the United States, taking advantage of strong human capital and shorter supply chains. Bilateral trade dropped significantly during the recession but has since rebounded strongly, growing significantly faster than trade with China.⁸ As demonstrated in the

above map (Figure 2), the growth of trade adds pressure (and has the potential to add additional pressure) on the already strained POEs and transportation corridors.

Despite growing trade, the number of trucks crossing the border has remained relatively stable since the year 2000. As shown in Figure 3 above, personal vehicle and pedestrian traffic shows an even starker contrast, with a clear inflection point around the turn of the century. Several studies have attempted to quantify the costs of border area congestion to the economies of the United States and Mexico. In what is perhaps a testimony to the fragmented and geographically disperse nature of the border region, most of these studies have focused on particular North-South corridors of traffic and trade rather than taking a comprehensive, border-wide approach. The specific results of the studies (summarized in Table 2, on next page) are quite varied, and too much value should not be placed on any single number. Nonetheless, one message comes through quite clearly—long and unpredictable wait times at the POEs are costing the United States and Mexican economies many billions of dollars each year.

Figure 4: Cars Waiting in Line at the San Ysidro Port of Entry



Photo by Matt H. Wade

Table 2: The Costs of Congestion

Studies of the Costs of Border Wait Times and Congestion to U.S. and Mexican Economies						
Region of Crossings	Region of Economic Impact	Wait Time (min.)	Year of Potential Impact	Cost to Regional Economy (billions of USD)	Costs in Jobs	Source
San Diego - Tijuana	U.S. and Mexico	...	2007	\$7.2	62,000	SANDAG, 2007 Update
Imperial Valley - Mexicali	U.S. and Mexico	...	2007	\$1.4	11,600	HDR HLB IVAG 2007
Tijuana	Mexico	180	2007-2008	\$1.9	57,000	Del Castillo Vera, COLEF, 2009
Ciudad Juarez	Mexico	132	2007-2008	\$1.5	87,600	Del Castillo Vera, COLEF, 2009
Nuevo Laredo	Mexico	174	2007-2008	\$3.7	133,800	Del Castillo Vera, COLEF, 2009
Nogales	Mexico	66	2007-2008	\$0.2	18,000	Del Castillo Vera, COLEF, 2009
US-Mexico Border	U.S.	63	2008	\$5.8	26,000	Accenture Draft, March 2008
US-Mexico Border	U.S.	99	2017	\$12.0	54,000	Accenture Draft, March 2008
El Paso/Cd. Juarez	El Paso/Cd. Juarez	2008 peak times: ~45 - 220	2035	\$54.0	850,000	Cambridge Systematics Inc., June 2011

Note: Year of Potential Impact refers to the year in which the listed monetary and employment effects take place. For dates before 2009, this refers to the estimated costs for the year of the study. For future years, this refers to the estimated cost that will take place if the border is not made more efficient.

Sources: See endnote number nine for source details

BOX 1: PRINCIPAL TRUSTED TRAVELER AND SHIPPER PROGRAMS FOR THE U.S.-MEXICO BORDER

Secure Electronic Network for Travelers Rapid Inspection (SENTRI): Begun in 1995, this program offers pre-approved pedestrians and passenger vehicles expedited entry into the United States at the southwest border. To enroll, one must pay the \$122 dollar fee and undergo a background check, fingerprinting, and interview with a CBP officer, demonstrating he or she is a low-risk traveler. In April 2012, there were 282,536 program members, up 71 percent from the 165,166 enrolled in 2008.ⁱ Increased membership caused the percentage of border crossings that they represent to grow from 9 percent in 2008 to 18 percent in 2012.ⁱⁱ Seventeen SENTRI lanes are now in place at twelve of the largest POEs along the U.S.-Mexico border.

Free and Secure Trade (FAST): This trusted shipper program operates at both the U.S.-Canada and U.S.-Mexico borders, expediting the passage of enrolled commercial trucks into the United States. After being started in 2002, the number of commercial drivers enrolled in the FAST program grew to 92,604 by February 2008 before falling to 77,999 in 2012.ⁱⁱⁱ The reasons for the drop are not entirely clear, but the most likely explanation seems to be that drivers did not feel they were receiving benefits sufficient to outweigh the effort and cost of enrollment (\$50 for five years). In order for a load to receive expedited treatment along the southern border, in addition to having a FAST program driver, the manufacturer and importer must be C-TPAT certified and the load must have a security seal.^{iv}

Customs-Trade Partnership Against Terrorism (C-TPAT): Created in 2002 in “direct response to 9/11,” C-TPAT is a voluntary supply chain security program open to companies around the world that do business with the United States.^v To be C-TPAT certified, a company must commit to implement a number of security procedures that address issues ranging from conveyance security to encouraging suppliers to strengthen their security. As a result of the increased level of confidence that U.S. officials have in imports from C-TPAT companies, their cargo is four to six times less likely to undergo a security or compliance examination,

expediting its import into the United States.^{vi} The number of companies registered has steadily grown since C-TPAT's creation, reaching 10,291 companies in 2012 (including more than 1,000 Mexican manufacturers and more than 900 Mexican carriers).^{vii} C-TPAT certified companies account for over fifty percent of all U.S. imports.^{viii}

Nuevo Esquema de Empresas Certificadas (NEEC): In December 2011, Mexico announced the creation of its own supply chain security program in order to strengthen security while expediting the processing of members' imports into Mexico. The program is reciprocal, meaning that C-TPAT certification would qualify a company for participation in the NEEC.^{ix}

SOURCES

- i The 2012 figure is from correspondence with Customs and Border Protection, DHS; 2008 figure from Customs and Border Protection, "Trusted Traveler Programs," Department of Homelands Security, May 23, 2008, http://www.naunewz.org/spp-docs/DHS-CBP-TrustedTraveler%280508%29_0.pdf.
- ii *ibid.*
- iii The 2012 figure is from correspondence with Customs and Border Protection, DHS, 2012; 2008 figure from Customs and Border Protection, DHS, 2008, [http://www.cbp.gov/xp/cgov/PrintMe.xml?xml=\\$/content/newsroom/press_releases/2008/february/02152008.ctt&location=/newsroom/news_releases/archives/2008_news_releases/feb_2008/02152008.xml](http://www.cbp.gov/xp/cgov/PrintMe.xml?xml=$/content/newsroom/press_releases/2008/february/02152008.ctt&location=/newsroom/news_releases/archives/2008_news_releases/feb_2008/02152008.xml).
- iv Correspondence with Customs and Border Protection, DHS, 2012.
- v Customs and Border Protection, *Securing the Global Supply Chain: Customs and Trade Partnership Against Terrorism Strategic Plan*, Department of Homeland Security, November 2004.
- vi Customs and Border Protection, "Customs and Trade Partnership Against Terrorism: A Guide to Program Benefits," Department of Homelands Security, available at <http://www.ngjensen.com/ctpat/ProgramBenefitsGuide.pdf>.
- vii Correspondence with Customs and Border Protection, DHS, 2012.
- viii Customs and Border Protection, "C-TPAT: Program Overview," DHS, 2011, http://www.cbp.gov/linkhandler/cgov/trade/cargo_security/ctpat/ctpat_program_information/what_is_ctpat/ctpat_overview.ctt/ctpat_overview.pdf
- ix U.S. Ambassador to Mexico Tony Wayne, quoted in *Voice of America*, "Promoting Cross-border Trade," January 12, 2012, <http://www.voanews.com/policy/editorials/americas/Promoting-Cross-Border-Trade-136968258.html>; see also ftp://ftp2.sat.gob.mx/asistencia_servicio_ftp/publicaciones/folleto11/Trip_NEEC_14122011.pdf.

Intelligence and Trusted Traveler Programs

Many Office of Field Operations (OFO) officers have several years of experience, allowing them to instinctively identify suspicious anomalies in an individual or vehicle. Nonetheless, they can be even more effective when additional information about a particular shipment or person is made available ahead of time or even as the individual arrives at the POE. License plate readers, for example, provide OFO officers with a vehicles crossing history, allowing him or her to identify suspect patterns and to crosscheck an individual's declarations with the electronic records. In the post-NAFTA and post-9/11 world, intelligence has become an increasingly vital tool for safe and efficient border management as both the volume of bilateral commerce and threat of attack by non-state actors have grown.

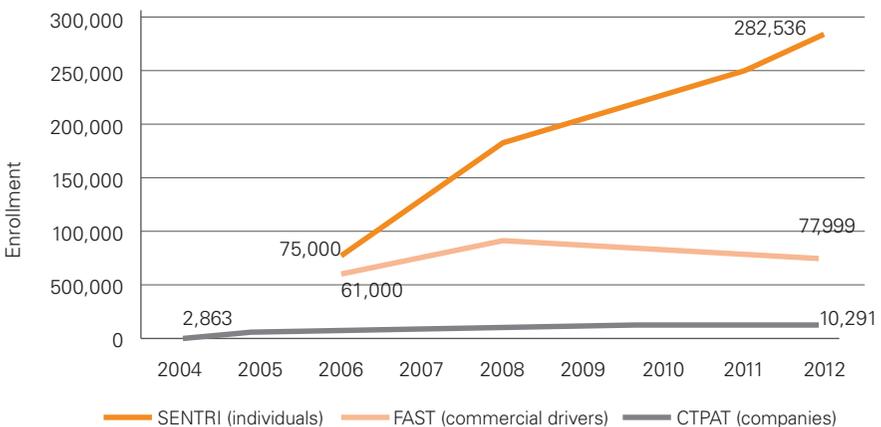
Voluntary trusted traveler and trusted shipper programs provide Customs and Border Protection (CBP) with intelligence needed to more accurately assess the risk presented by someone seeking entry to the United States (see box 1 on the previous pages for information on the main programs). Frequent crossers can enroll in these programs by providing CBP with additional documentation, undergoing background checks, and taking steps to increase supply chain security. In return, crossers are offered expedited processing at the borders, which saves them time and money and thereby incentivizes their participation in the programs. By speeding the passage of low-risk individuals and shipments, OFO officers are able to focus more time and energy on higher-risk or unknown traffic. That is, by making the proverbial haystack that officers must sift through smaller, they increase their chances of finding the needle.

Trusted traveler and shipper programs are a win-win. They decrease wait times, minimize the need for additional staffing and lanes, and increase border security. While the programs have generally been successful, they also have a huge amount of untapped potential. The SENTRI trusted traveler program, for example, expedites the passage of 18 percent of all northbound traffic. This is a significantly larger percentage than in previous years, but since the majority of traffic is made up of frequent crossers that live in border communities, CBP might consider setting a goal as high as forty to fifty percent within the next

several years. To reach such a lofty goal, CBP would need to work with Mexican local and federal authorities to extend the reach of dedicated lanes so that program members do not have to wait in traffic before reaching their express lane. The use of trusted traveler and shipper programs might also be increased through outreach (perhaps application fee discount coupons being handed to frequent crossers) and the expansion of the program to additional POEs.

The FAST program for commercial trucks appears to need particular attention. After seeing significant growth since its implementation in 2002, enrollment has actually declined since 2008 (see Figure 5, below). The full causes of this decline should be studied and addressed, given the potential value to security and the competitiveness of regional manufacturing that the FAST program represents. Since FAST lanes can only be used when FAST drivers are carrying goods from a CTPAT supplier, special attention must be paid to developing an incentive structure to encourage participation in both programs.

Figure 5: Trusted Traveler and Shipper Programs Enrollment, 2004-2012



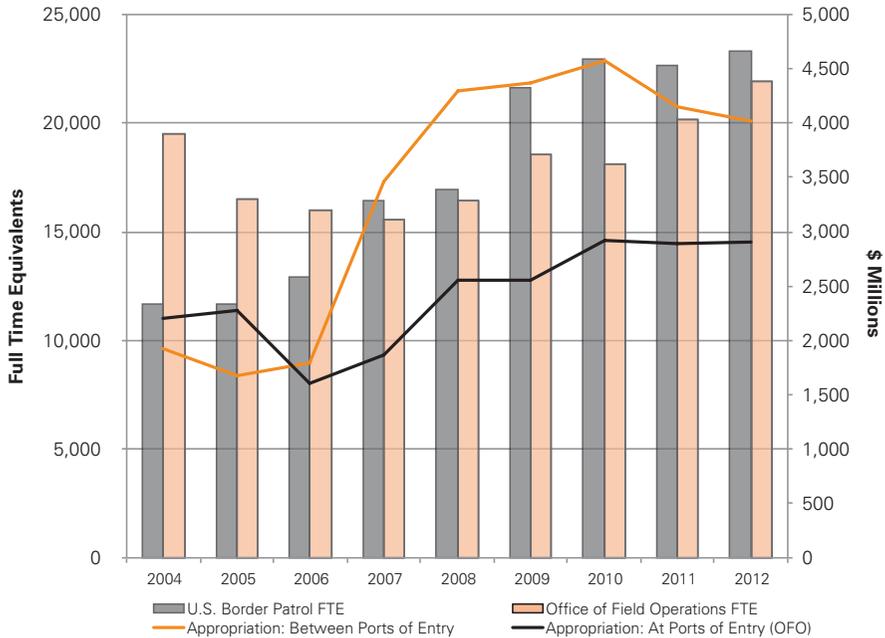
Source: Customs and Border Protection, DHS¹⁰

Greater experimentation in the promotion and implementation of trusted traveler and shipper programs (SENTRI, CTPAT, FAST, and also the use of Ready Lanes for those with WHTI compliant documents) would be a useful tool in developing best practices for improving security while facilitating commerce.

Staffing Levels at the Ports of Entry

Since 9/11 and the increase in security at our land ports of entry with Mexico, one of the major points of contention between border communities, regional interest groups and Washington has concerned staffing levels and their effects on local economies. While the number of U.S. Border Patrol agents has more than doubled over the past decade, Office of Field Operations (blue-uniformed CBP Officers that staff the ports of entry) staffing has remained relatively stable (see Figure 6). In 2007, the U.S. Congress began to fund the vigilance of the areas between the POEs at a higher level than the POEs themselves. This is surprising given the increase in bilateral trade, the significant increases in border wait times since 9/11, and evidence that appears to suggest that the POEs, rather than the areas between them, are a more likely crossing point for drugs and dangerous individuals (see the chapter on border security). The U.S. Government Accountability Office has suggested that the levels of staffing and training for CBP Officers are each lacking.¹¹ Border community interest groups often point to the remarkable increase in U.S. Border Patrol staffing, infrastructure and implementation of technology and critique the relatively little innovation they see at the ports.

Figure 6: Border Enforcement Appropriations and Personnel: Comparison of Resources at and Between Ports of Entry, FY2004-FY2012



Notes: Total appropriations between the ports include US Border Patrol and Fencing, Infrastructure, and Technology funding.

Source: Marc Rosenblum (Congressional Research Service), Testimony on Measuring Border Security before the Subcommittee on Border and Maritime Security, Committee on Homeland Security, U.S. Congress, May 8, 2012.

In addition to the important discussion on staffing levels (Rep. Sylvester Reyes’ PORTS Act has called for 5,000 additional staff for the land ports of entry, for example), consideration is merited on the *nature* of these important positions. The difficulty of the job combined with the numerous hours of overtime make for a truly challenging work environment for these key federal employees who protect border communities and the nation while facilitating U.S.-Mexico trade.

In response, and often as a supplement to the issue of staffing levels, some analysts have suggested that border security and economic competitiveness might be strengthened by efforts to improve job quality—and therefore retain talent—for CBP Officer positions.¹² The expanded use of technology and the movement of some inspection and admittance operations to Mexico (customs preclearance) might also be steps in the creation of a 21st Century Border officer.

Customs

In much the same way as long and unpredictable wait times add costs to cross-border transactions, the significant documentation requirements faced by importers and exporters to take advantage of the tariff preferences granted

Documentation requirements faced by importers and exporters to take advantage of the tariff preferences granted by NAFTA actually can sometimes cut away at the very cost savings the agreement was meant to provide.

by NAFTA actually can sometimes cut away at the very cost savings the agreement was meant to provide. Rules of origin stipulate that only products from the U.S., Canada or Mexico should get preferential treatment. Firms must therefore maintain detailed records regarding the source of their products, sometimes including their parts and materials. This paperwork burden can be particularly costly and act as a barrier to

exporting for small and medium-sized businesses.

In theory, the solution is a customs union (like the European Union) with common external tariffs charged to non-member countries. **With no intraregional tariffs and no need to verify the origin of goods moving within the region, taking commercial goods across the U.S.-Mexico border would only require a basic security.** In practice, however, this would be very difficult to achieve in North America due to the many trade agreements each country has negotiated and the industries each has sought to protect.

A more appropriate approach for our region may be to take things product by product.¹³ For goods that already face similar external tariffs in each of the NAFTA countries, negotiations could be started to have tariffs lowered to the lowest of the three (trade agreements make it hard for countries to raise most tariffs). When a common external tariff is reached for a product, it could then be exempted from most customs requirements at the United States' southern and northern borders.

Other important efforts are underway to simplify the management of existing customs requirements, moving toward a process that allows the multiple customs forms to be filled out without repeating steps in one convenient online form. These systems are known as a "single window." The U.S. has mostly implemented such a solution for imports but not exports, and Mexico has just launched its Ventanilla Unica, which needs ongoing development to become a true one-stop system for customs paperwork.

Balancing the Dual Mission

Border management changed significantly after 9/11, and CBP's primary mission is to prevent terrorists and instruments of terror from entering the United States. This is obviously crucial to U.S. national security. Nonetheless, on a daily basis CBP must facilitate commercial traffic (also part of its mission) and disrupt the flow of unauthorized immigrants and smuggled goods. In the best of cases, CBP supervisors, agents, and officers find ways to balance the need to protect our nation's security and economy. As some supervisors at the POEs already clearly do, the role of leadership in the context of CBP's dual mission is to both seek out best practices and empower officers to experiment with creative ways to facilitate travel and commerce while protecting the security of the nation. Too often the primacy of the security mission is used as a justification for tolerating long wait times for trucks, cars, and pedestrians attempting to cross.

Port of Entry Infrastructure

One of the most obvious and often cited ways to reduce congestion at the POEs is to update and expand border crossing infrastructure, and credit is certainly due to the U.S. government and border communities for significant recent advances. After a decade with no new ports of entry built, three new crossings were opened in 2010: Anzalduas, San Luís II, and Donna-Rio Bravo.¹⁴ In 2011, seven new lanes were opened on the World Trade Bridge, the most important crossing point for commercial traffic between the United States and Mexico. Significant expansions are also underway at San Ysidro, the most trafficked crossing for individuals, and at Nogales-Mariposa. Despite these import-

The challenge is now for heterogeneous and geographically disperse border communities to find a way to speak with a common voice, for policymakers in Washington and Mexico City to guide strategic planning for regional competitiveness, and for all stakeholders to engage vigorously in binational dialogue and cooperation.

ant advances, much work remains to be done. Average U.S. land POEs are more than forty years old, with some over seventy years old.¹⁵ Customs and Border Protection believes that “federal appropriations have not kept pace with needs,” noting \$6 billion dollars of investment are needed to “fully modernize” the land ports of entry along the United States’ southern and northern borders.¹⁶

Given the fact that POE improvements offer significant and tangible monetary benefits to border communities and trade-dependent industries, state, local and private entities are often willing to contribute funding to border infrastructure projects. Under the

current budgetary constraints, it makes sense for federal agencies to take full advantage of these alternative funding sources. Along the Texas-Mexico border, the majority of POEs are owned by the city or county in which they are located.

This model for infrastructure investment could be expanded along other parts of the U.S.-Mexico border, but changes to current federal legislation appear to be necessary to allow CBP to “accept reimbursement from sources other than Congress.”¹⁷ As demonstrated above, additional staffing is and will be increasingly necessary as trade increases. With the active support of border stakeholders across the region, a proposal along these lines designed in collaboration with federal agencies could likely garner legislative support and could open significant opportunities for investment despite tough budgetary times.

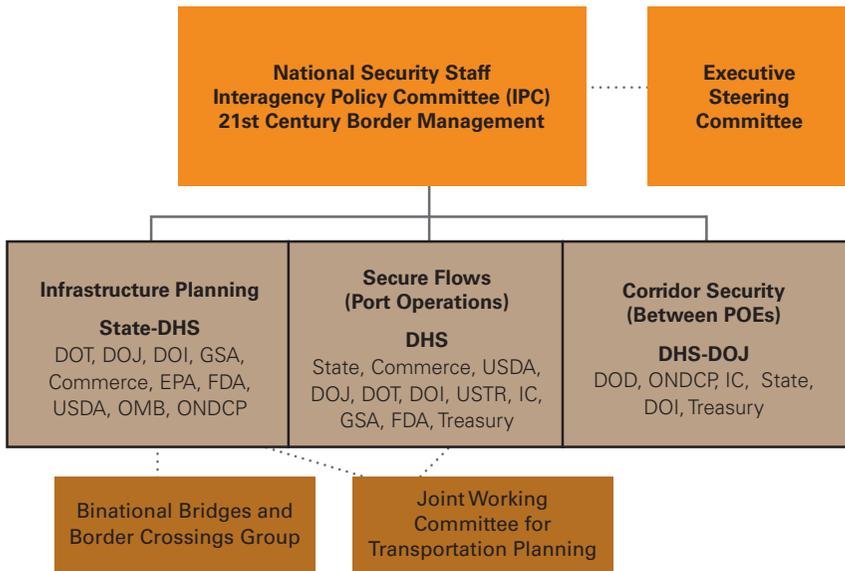
Coordination and Cooperation: Border Master Plans and the Interagency Process

Managing the U.S.-Mexico border is made particularly difficult by the large number of federal, state, and local government entities that manage and protect the border and surrounding transportation infrastructure.

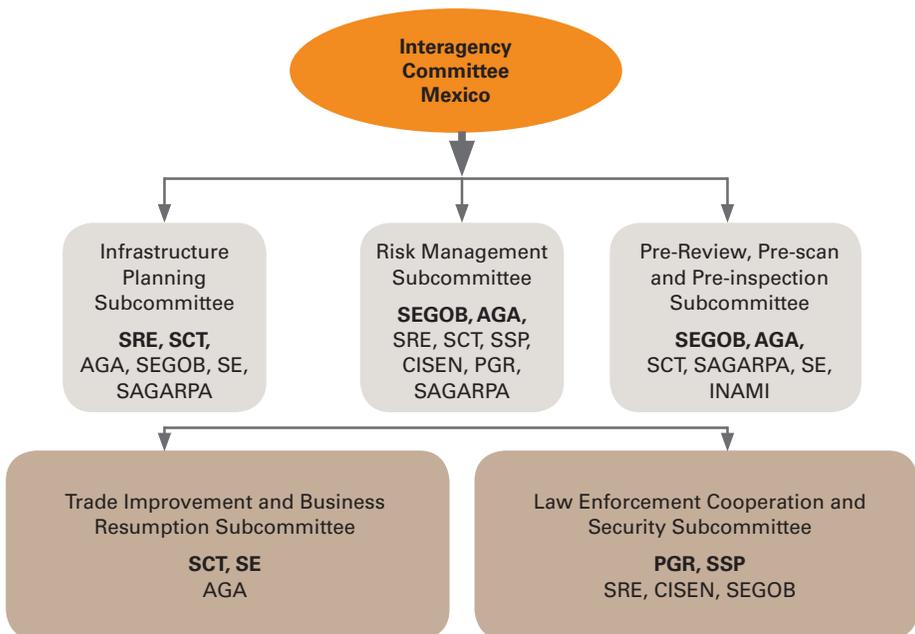
While the State Department and Mexico’s Foreign Ministry manage most bilateral issues, in the case of the border they must work alongside a number of federal stakeholders, such as Commerce/Economía, DHS/Gobernación, DOT/SCT, and EPA/SEMARNAT, to name but a few. In light of border region complaints over the slowdown in crossborder commerce due to increased concerns regarding terrorism and drug-trafficking related violence, in 2010 the U.S. and Mexican governments reconfigured their interagency processes and created the bilateral **Executive Steering Committee on 21st Century Border Management (ESC)** in an effort to improve both interagency and binational coordination. Officials on both sides of the border cite the ESC as a major advance in federal-level coordination of border management.

For the United States, the National Security Staff Interagency Policy Committee sits at the nexus of the new Executive Steering Committee and three major components, Infrastructure Planning, Port Operations, and Corridor Security. The increased involvement of the White House in border affairs reflects an understanding that only top-level leadership can manage the many departments and agencies with interests in the border.

Figure 7: U.S. and Mexican Interagency Structures Feeding into the Bilateral Executive Steering Committee



Source: U.S. Department of State.



Source: Government of Mexico.

A key component of how the U.S.-Mexico border functions to facilitate trade has to do with transportation planning. In the absence of strong and coordinated planning, infrastructure investments on one side of the border or in one region can simply feed traffic into a bottleneck in another area. This process is largely managed by the Joint Working Committee on Transportation Planning (JWC), a binational entity chaired by the two countries' transportation agencies but including representatives from many federal agencies and state departments of transportation. As border communities felt themselves increasingly affected by decisions made in Washington and Mexico City, their insistence on being included in these discussions led to the regional border master plan process, in which state DOTs lead stakeholder discussions on border infrastructure priorities. While this process makes sense from a U.S. perspective (in the absence of a national transportation plan, state DOTs essentially manage and spend federal transportation dollars), this process is somewhat of a mismatch for Mexico's more centralized political system. The system seems to work better in certain cross-border communities than others, as is seen with California and Baja California's award-winning master plan.

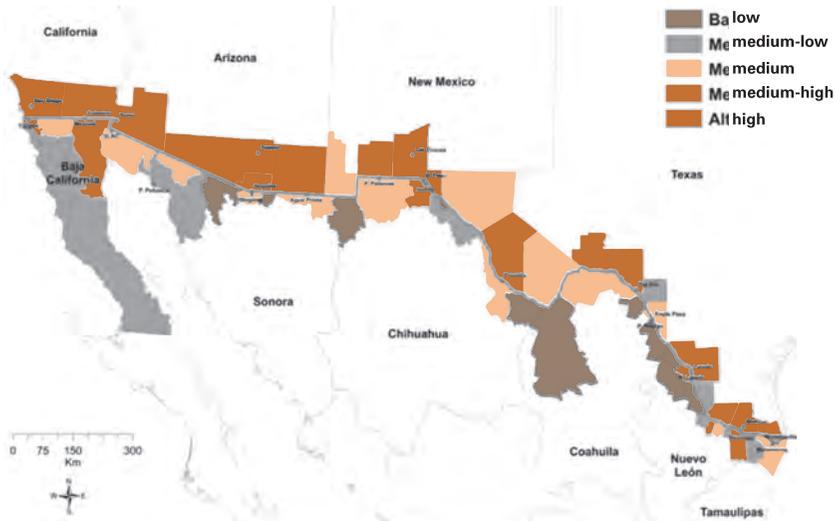
There is no simple answer to the complex challenge of coordinating border planning and management, but a few key ingredients for success can be identified. First, border stakeholders need to be at the table—border experts in Washington and Mexico City are no substitute for those living the implications of policy on a daily basis. Nonetheless, a strong federal role is important. Border communities often work together, but they also compete to attract federal resources and trade flows. The federal agencies are well placed to analyze and balance competing needs, especially in dialogue with border communities. Finally, and hopefully obviously, cross-border collaboration is vital. To strengthen regional competitiveness and security, we need regional coordination.

Regional Impact of Border Management on Local Economic Development in the U.S.-Mexico Border Region

The intense U.S.-Mexico trade flows pass through the U.S.-Mexico border region, a region with a complex economy that can be seen as both wealthy and

poor. A number of organizations—the Border Governors Conference included among them—have often noted that the ten states together as a single economic entity would comprise the fourth largest economy in the world. Other organizations have noted that the region possesses a highly varied economic makeup, with San Diego/Tijuana and El Paso/Ciudad Juarez serving as the principal poles of wealth and other cities and particularly rural regions enjoying a much less prosperity. The Tijuana-based Colegio de la Frontera Norte and Francisco Lara of Arizona State University have developed an index that weighs many of the key variables that measure competitiveness. The map below largely confirms previous findings, and the research sets an important baseline to measure efforts underway to strengthen regional competitiveness. The research suggests the U.S. side of the border generally has more tools for high productivity, but the main population centers on the Mexican side tend to also have strong competitiveness. Efforts to further foment the development of infrastructure, human capital, innovation and cluster economies in the key twin-cities of the border region would strengthen not only the competitiveness of the border region but also the areas served by the trade corridors running through them (virtually all of the U.S. and Mexico).

Figure 8: Composite Transborder Competitiveness Index



Source: *Transborder Development Index*, El Colegio de la Frontera Norte and Dr. Francisco Lara Valencia in collaboration with the Border Research Partnership

While much of this chapter focuses on binational and national policy responses to border challenges, governors, state legislators and mayors (among others) are key local players in economic decision-making. Much of the border region is rural or made up of smaller urban areas, and economic development in these areas faces challenges that are often more *domestic* than *binational* in nature (primary and secondary education, for example).

While a number of studies commissioned by local entities (see Table 2 on the various crossborder economic studies conducted by local entities) point out the impressive economic significance of the ports of entry, studies outlining the best practices for local border region decision-makers in terms of taking advantage of crossborder trade for local development are few and far between. This may be because the cities along the U.S.-Mexico border have historically seen themselves to be in competition with each other in terms of attracting business. Often, economic development in the border region is discussed in stark zero-sum terms (City A wanting to take some crossborder business away from City B, for example).

Despite the incredible diversity present throughout the U.S.-Mexico border region, many border communities face similar challenges. Communities throughout the region are seeking to strengthen their bases of local suppliers so that an ever-greater portion of the value-added processes can take place (and therefore support jobs) locally. The development of human capital—including education, workforce training, and strategies to attract and retain high-skilled workers—is another shared challenge. Attracting talent, companies, and tourists are all made more difficult by the perceptions (and sometimes realities) of violence in the region, and of course, communities all along the border stand to benefit from better infrastructure and more efficient ports of entry. All of this is to say that the incentives are in place for greater collaboration for economic development not only across the border, but also from one end to the other. The relatively newly created U.S.-Mexico Border Mayors Association is an entity which will hopefully take up this unique and daunting challenge of articulating a border-wide vision of economic development that is rooted in the need for local communities to share best economic development practices.

Conclusion: The U.S.-Mexico Border Region's Economic Health

The state of the border is dynamic. The 1990s were the decade of NAFTA and skyrocketing trade. The 2000s saw security concerns grow and recession strike. The new decade has only just begun, but the potential is there for a resurgence of competitiveness and regional integration. While important policies have recently been developed by both federal governments in their attempts to catch up with global economic realities and both economic and security developments on the ground, clearly the two nations need to intensify their efforts to make the U.S.-Mexico border an engine for growth. The Declaration of the 21st Century Border by the White House and Los Pinos has provided our nations with a framework for the future, breaking down the false choice between security and economy in border management. There are strong ideas—including trusted traveler and shipper programs, preclearance, customs harmonization, and public-private partnerships—that have enormous potential. The challenge is now for heterogeneous and geographically disperse border communities to find a way to speak with a common voice, for policymakers in Washington and Mexico City to guide strategic planning for regional competitiveness, and for all stakeholders to engage vigorously in binational dialogue and cooperation.

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CHAPTER 3: THE STATE OF SECURITY IN THE U.S.-MEXICO BORDER REGION

Erik Lee and Eric L. Olson

EXECUTIVE SUMMARY

Increasing Federal Investment—and Involvement—in a Complex Binational Region

The state of security along the U.S.-Mexico border easily ranks as one of the most highly charged topics of public discussion and debate in both the United States and Mexico during the past several years. Concerns about global terrorism, potential threats posed by those entering the United States illegally, and fears that skyrocketing violence in Mexico might “spillover” into the United States have led to dramatic policy shifts and significant new investments by the U.S. to “secure” the border.

Yet discussions about border security cannot be fully extricated from or effectively addressed in isolation from other policy areas such as trade and the environment.

Diverse domestic policies and international relations all play out in some fashion at the border, sometimes effectively and productively, and in other instances very inefficiently. Ironically, many of these policies have little to do with the border *per se* but reflect broader *domestic* concerns regarding national security and public safety in the U.S. and Mexico. All of this has taken place in a context in which U.S.-Mexico bilateral relations have become both more collaborative and more controversial at the same time.

The unprecedented U.S. security buildup along the border post-9/11 stands out as a key feature of the increased federal role and is exemplified by the increase in federal personnel. The U.S. Border Patrol now has over 21,000 agents assigned to the various border patrol sectors, an increase in staffing of over 500% since the early 1990’s. Additionally, investments in infrastructure (fencing) and technology *between* the land ports of entry stands in stark contrast to the multi-billion dollar deficit in ports of entry infrastructure¹ that hampers both legitimate trade and travel as well as effective security operations.

North-South and East-West Asymmetries

Security asymmetries abound along the U.S.-Mexico border. As measured by Federal Bureau of Investigation crime statistics, U.S. border cities rank among the safest in the United States, and stand in stark contrast to the fragile-though-improving security situation in major Mexican border cities such as Ciudad Juárez. The vast difference in institutional capacity (police, courts, etc.) is not the only explanation for the security situation on the Mexican side of the border. This paper underscores the remarkable difference between the *relatively* peaceful western end of the Mexican side of the border (which includes the states of Baja California and Sonora) and the four eastern states (Chihuahua, Coahuila, Nuevo León and Tamaulipas).

Improved border management, a challenge during normal fiscal times, is particularly difficult in the United States' constrained fiscal environment and thus requires increased attention and creative solutions. For example, the two governments—in close collaboration with border communities— should focus their efforts on making the land ports of entry from San Diego to Brownsville as safe and efficient as possible to enhance both our physical and economic security.

Depressurizing and innovating in the border region

Security in either country does not depend solely on what happens at the border. Rather, the more the two governments can push key security processes away from the border, the better. For example, disrupting illegal bulk cash transfers or firearms trafficking can be done more effectively through investigations and intelligence operations away from the border than via random vehicle checks at the border.

Much work remains to be done in strengthening overall law enforcement capacity in both countries to challenge cross-border trafficking and criminal activity. For example, fully implementing justice reform and advancing police professionalization in Mexico, as well as disrupting the organizations engaged in migrant smuggling, human trafficking and moving illicit substances northward

into the United States would be important steps forward. Interestingly, border states such as Chihuahua and Baja California stand out for their implementation of justice reform and are in the vanguard of this fundamental change. In addition, the United States needs to demonstrate greater political courage and creativity to fulfill its commitments to reduce the demand for illegal drugs at home and disrupt the flow of weapons and money that exacerbate the violence associated with drug trafficking.

Additionally, progress in modernizing and professionalizing Mexico's multiple police forces and improving public trust in law enforcement will be critical to creating a safer U.S.-Mexico border region. There is room for much more improvement at all levels of law enforcement, particularly at the state and municipal levels. Achieving the delicate balance between federal and local needs, and economic versus security concerns, will require greater patience in the form of a more realistic (longer) policy implementation timeline, improved leadership, and creative thinking by all parties.

A framework for measuring border security: key objective and subjective factors

The purpose of this chapter is to begin to set a baseline for measuring border security between the United States and Mexico. Our plan is to re-examine these issues on a semi-regular basis, making adjustments to both the methodology and criteria as needed. To initiate this process, we have chosen to focus on four major areas to evaluate related to border security. These include incidence of terror related activity and warnings at the border; levels of violence on both sides of the border and an assessment of how these might be linked; seizures of dangerous drugs, money and firearms at the border; and efforts aimed at apprehensions of undocumented and unauthorized migrants.

In addition, border security is characterized not only by objective measures such as the above, but also by a broad spectrum of subjective factors including key U.S. and Mexican government strategies and policies in response to border security challenges. These include efforts such as the 21st Century Border interagency initiative in the U.S. and Mexico and efforts to upgrade land ports of entry along our shared border.

What is Needed Most? Creativity, Capacity-building, and Collaboration

As the economies, cultures, and destinies of both nations become increasingly intertwined, both federal governments, the border states and communities will have to find new, creative and robust ways to increase public safety in the U.S.-Mexico border region. The U.S. and Mexico have only recently begun to make real progress on a bi-national security regime that is sustainable and “built to last.”

Lasting progress in U.S.-Mexico border security can only come from increased *bilateral collaboration and independent domestic progress* on key issues affecting security in the United States and Mexico. While it is important to continue strong federal coordination, encouraging local collaboration can also yield significant and important dividends in fighting crime affecting cross-border cities.



Photo by Erik Lee

INTRODUCTION: THE NATIONAL SECURITY IMPACT OF U.S.-MEXICO BORDER SECURITY

The state of security along the U.S.-Mexico border region easily ranks as one of *the* most highly charged topics of public discussion and debate in *both* the United States and Mexico for the past several years. It is an important issue that involves a number of complex public policy pieces, many of which do not have anything to do with the border *per se* but reflect domestic concerns regarding national security and public safety in the U.S. and Mexico. In many ways, the border region is where these national policies—and stubborn on-the-ground realities—“bump up against” one another in ways which are particularly challenging to analyze and around which to build good public policy.

Bottom line, the border security agenda has become less about national security and terrorist threats, and more about public safety.

Both federal governments have made the border region’s security a priority focus, though this is particularly true in the case of the United States since September 11, 2001. As the horrors perpetrated on that day began to sink in among the American people and U.S. policy makers, one area of immediate concern was the country’s borders with Canada and Mexico. The border with Mexico in particular became a matter of special focus out of fear that terrorists might use the relatively porous Southwest border as an entry point into the United States to carry out further terrorist attacks against the homeland.

With this in mind, the Department of Homeland Security (DHS) was created by the U.S. Congress through the Homeland Security Act of 2002. It represented the largest realignment of the U.S. federal government since World War II. Twenty-two different agencies were moved, consolidated and/or reorganized under the aegis of DHS, including some of the key agencies that managed security along the U.S. border with Mexico. These new agencies included Customs and Border Protection, which includes the U.S. Border Patrol, the

Office of Air and Marine, and the Office of Field Operations. In addition, the U.S. Congress created a new unified command (Northern Command or NorthCom) whose primary mission is to protect the U.S. homeland from external attack, and provide “civil support” in response to “domestic disaster relief operations that occur during fires, hurricanes, floods and earthquakes.”² NORTHCOM’s mission also includes support for “counter-drug operations and managing the consequences of a terrorist event employing a weapon of mass destruction.”³

Now, twelve years after the 9/11 tragedy, we have an important opportunity to look again at the issue of border security and see how the issue has evolved and changed in that period. While prevention of cross border terrorist threats formally remains the top priority for border agents, secondary issues have come much more to the fore, possibly because real cross-border terrorist threats have not materialized, and partly because other more pressing issues have taken center stage – stopping cross border violence, illegal migration, and drug trafficking.

Bottom line, the border security agenda has become less about national security and terrorist threats, and more about public safety.

A Framework for Measuring Border security: Key Objective and Subjective Factors

The purpose of this paper is to begin to set a baseline for measuring border security between the United States and Mexico. Our plan is to re-examine these issues on a semi-regular basis and make adjustments to both the methodology and criteria as needed. To initiate this process, we have chosen to focus on four major areas to evaluate related to border security. These include incidence of terror related activity and warnings at the border; levels of violence on both sides of the border and an assessment of how these might be linked; seizures of dangerous drugs, money and firearms at the border; and apprehensions of undocumented and unauthorized migrants.

In addition, border security is characterized not only by objective measures

such as the above but also by a broad spectrum of subjective factors including key U.S. and Mexican government strategies and policies in response to border security challenges. These include efforts such as the 21st Century Border interagency efforts in the U.S. and Mexico and specifically efforts to upgrade land ports of entry along our shared border. More specific, national efforts include a broad range of rule of law efforts in Mexico, the new U.S. Border Patrol Strategic Plan 2012-2016 and anti-drug efforts in the United States and particularly Mexico. Additionally, President Enrique Peña Nieto has begun to outline his government's priorities for building public security by committing his government to continue institutional reforms, re-focusing on the most violent crimes, and committing to increased social investments in the 250 most violent municipalities through the National Plan for the Social Prevention of Violence and Crime. And finally, we make special mention of the impact of technology in border security, which has seen ups and downs over the past several years but which promises to change how our shared border is managed in the years ahead.

Potential vs. Actual Cross-border Terror Threats

During the months and years following the 9/11 terrorist attacks, the nation's long and relatively porous and undefended borders, particularly the U.S.-Mexico border, were drawn deeply into the national conversation about national security. Border security became part of the overall analysis and rethinking of U.S. national security vulnerabilities, which included transportation networks and other critical infrastructure security. Ironically, the 9/11 terrorists did not enter the United States over the northern or southern border but entered legally on student or immigrant visas.⁴ Nevertheless, fear that U.S. borders could be vulnerable to terrorist incursions led to a number of important policy decisions.

Significant fortification of the border with additional staff, equipment, and infrastructure to make access more difficult became the principal way policy-makers sought to address perceived border vulnerabilities. Along the way, these concerns were conflated with a growing call for restrictive immigration policy, and the so-called "sealing" of the border to keep out undocumented migrants, criminals and to halt exploding violence in Mexico from crossing into the United States. Despite these concerns, various public announcements (testimony,

speeches, and the like) from federal government officials in various agencies state a common theme: no significant terrorist threat to the United States has materialized in Mexico nor penetrated the U.S.-Mexico border since 2001. The State Department's annual country reports on terrorism provide clear language to this effect.

"There was no evidence of ties between Mexican criminal organizations and terrorist groups, nor that the criminal organizations had aims of political or territorial control, aside from seeking to protect and expand the impunity with which they conduct their criminal activity..."

—U.S. Department of State Country Reports on Terrorism 2011⁵

One U.S. government agency charged with keeping terrorists from crossing into the United States is the United States Border Patrol, a division of U.S. Customs and Border Protection (CBP). As its first priority, the U.S. Border Patrol specifically seeks to "Prevent Terrorists and Terrorist Weapons from Entering the United States." It would come as no surprise to anyone with a passing interest in border security that U.S. Border Patrol strategy, goals, objectives, and tactics are the subject of fierce public debate. Recently, the United States Government Accountability Office criticized the new U.S. Border Patrol Strategy in a report, "Border Patrol Strategy: Progress and Challenges in Implementation and Assessment Efforts." As reported by GAO, the Border Patrol finds itself in a challenging period characterized by multiple transitions:

"Border Patrol officials stated that the 2012 Strategic Plan will rely on Border Patrol and federal, state, local, tribal, and international partners working together to use a risk-based approach to secure the border, and include the key elements of "Information, Integration, and Rapid Response" to achieve objectives. These elements were similar to those in the 2004 Strategy and GAO's past work highlighted the progress and challenges the agency faced obtaining information necessary for border security; integrating security operations with partners; and mobilizing a rapid response to security threats."

In this context of ambiguity, institutional challenges and an overall lack of good

data, precise measures of terror activity in the U.S.-Mexico border region are difficult to come by. However, U.S. border security officials interviewed for this report stated that the primary terrorist-related concern at the border involve Aliens from Special Interest Countries (ASIC), nationals from countries that are either designated state sponsors of terrorism (such as Iran) or countries where terrorist organizations are known to operate (such as Colombia or Pakistan). The ASIC designation does not necessarily imply the person is a terrorist, but it does subject him/her to closer scrutiny by Customs and Border Protection officials than other aliens apprehended at or between the ports of entry.

According to information from CBP, ASIC arrests by the Border Patrol increased 44 percent between Fiscal Year 2007, when 462 arrests were made, and Fiscal Year 2010, when 663 arrests were made. During Fiscal Year 2011 the number of arrests dropped to 380, a 43% decline when compared to 2010, and the trend lines through June, 2012 were down another 32%. The majority of these arrests occur on the Southwest border, including 193 reported between January and June 2012 (see Table 1 below).

Table 1: Arrests of Aliens from Special Interest Countries (Southwest Border), FY2000-FY2012

Fiscal Year	Number of Arrests
2000	676
2001	766
2002	849
2003	807
2004	62
2005	510
2006	No data available
2007	462
2008	No data available
2009	No data available
2010	663
2011	380
2012 (January to June only)	193

Sources: Congressional Research Service (2000-2005 data);⁸ Internal U.S. Customs and Border Protection report, "Aliens from Special Interest Countries." 2012.

Nevertheless, public statements provided by the U.S. intelligence community and the Department of State suggest that risks of terrorism along the border with Mexico are of a potential rather than actual nature (documented and verified).

The data available seems to indicate that ASIC reports—including those made on the Southwest border—are in decline. The authors of this report are unaware if any of these cases have resulted in specific terror-related investigations, although there was one publicly reported case involving a Somali man in Texas that allegedly involved links to Al-Shabab.⁹

Nevertheless, public statements provided by the U.S. intelligence community and the Department of

State suggest that risks are of a potential rather than actual nature (documented and verified). In its 2011 Terrorist Threat Assessment for Mexico, the Department of State notes that, “There was no evidence of ties between Mexican criminal organizations and terrorist groups, nor that the criminal organizations had aims of political or territorial control, aside from seeking to protect and expand the impunity with which they conduct their criminal activity.”¹⁰ According to the Department of Justice, however, “the threat of terrorism exists wherever criminals regularly exploit gaps in homeland security. Terrorists could conceivably attempt to enter the United States or smuggle weapons of mass destruction across the Southwest Border by utilizing routes and methods established by drug and alien smugglers.”¹¹

Levels of Violence in the U.S.-Mexico Border Region: Focus on the U.S. Side of the Border

“The Mexican cartels have a presence in the United States, but we are not likely to see the level of violence that is plaguing Mexico spill across the US border. We assess that traffickers are wary of more effective law

enforcement in the United States. Moreover, the factor that drives most of the bloodshed in Mexico—competition for control of trafficking routes and networks of corrupt officials—is not widely applicable to the small retail drug trafficking activities on the US side of the border. ”

Unclassified Statement for the Record on the Worldwide Threat Assessment of the US Intelligence Community for the House Permanent Select Committee on Intelligence. James R. Clapper, Director of National Intelligence, February 2, 2012

The risks and potential for spillover violence in the United States that is connected to drug trafficking and other criminal trafficking between Mexico and the United States has been a major concern for policy makers and for communities along the border and, indeed, across the United States. Yet efforts to measure the extent to which spillover violence is occurring have been difficult. In general, spillover violence is understood to be the violence that occurs as a result of the transnational trafficking of drugs. It can be directed at civilians, law enforcement officers, and other criminals or criminal organizations.

The debate about spillover violence has been divided along three lines. Some local U.S. authorities claim that spillover violence is real and a serious threat to the safety and security of the United States. According to a report by two retired U.S. generals:

Living and conducting business in a Texas border county is tantamount to living in a war zone in which civil authorities, law enforcement agencies as well as citizens are under attack around the clock. The Rio Grande River offers little solace to the echoes of gunshots and explosions. News of shootings, murders, kidnappings, beheadings, mass graves and other acts of violence coming across the border go far beyond any definition of “spillover violence.”¹²

Other experts and analysts have argued that there is insufficient data to draw conclusions about spillover violence. The Justice Department's National Drug Intelligence Center stated in a 2011 report that, "NDIC is unable to confidently assess the trends in overall drug-related crime in the U.S. Southwest Border region."¹³ It found that "Isolated instances of crimes such as kidnappings and home invasions robberies directed against those involved in drug trafficking are reported in U.S. border communities. However, the available data are insufficient to support trend analysis – particularly an analysis of whether such crime is increasing."¹⁴

Still others, including the Woodrow Wilson Center's Mexico Institute, have used Federal Bureau of Investigation crime data to show that overall crime along the United States side of the international boundary is lower than the national and statewide averages and that the border region has not experienced an increase in violent crime during the last five years.¹⁵ See Figure 1 below, which shows the relatively low level of violence in the major U.S. border cities.

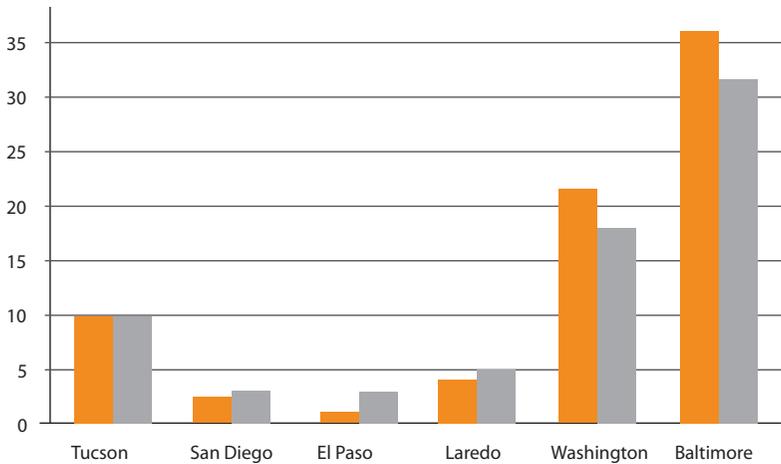
The U.S. National Drug Intelligence Center (NDIC) supports this view when it states in its 2011 report that, "Federal Bureau of Investigation (FBI) data show that overall violence crime rates in the Southwestern states trended downward between 2007 and mid-2010, while overall property crime rates generally remained stable."

In general, then, the authors of this report have concluded that there currently is insufficient evidence to suggest a pattern of spillover violence between Mexico and the United States that affects the major U.S. urban centers along the border (see Figure 1).

Furthermore, what the authors commonly found in interviews with citizens and government officials alike is evidence for a significant urban/rural split in perceptions of border security. That is, while the statistical evidence shows that the major U.S. *urban* border areas have witnessed stable or even falling crime rates for many years, a general perception of insecurity is found among some rural residents of the U.S. border areas. And while overall apprehension rates are falling in most Border Patrol sectors, some rural residents interviewed

by the authors reported an increase in incursions across their properties. From a researcher’s perspective it is difficult to compare this anecdotal evidence to U.S. Border Patrol apprehension statistics—one of the principal statistical underpinnings of border security analysis—which are reported at the sector level, a level of aggregation that may miss trends in the apprehension statistics on a *station* level, a smaller unit of analysis with data that is not made available to the public. Thus microregional trends may not be reflected in overall trends captured by the publicly available federal statistics.

Figure 1: Violence in Major U.S. Border Cities



Source: FBI Uniform Crime Report, “Offenses Reported to Law Enforcement by City 100,000 and over in population,” 2011.

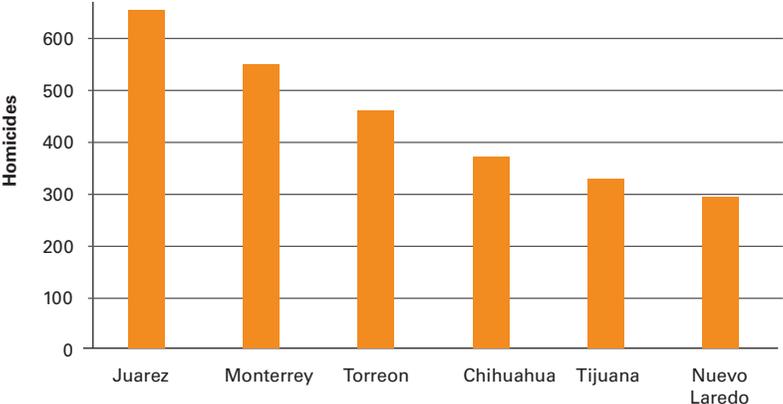
Levels of Violence in the U.S.-Mexico Border Region: Focus on the Mexican Side of the Border

The picture of violence on the Mexican side of the border is clearer, particularly from 2006 on as the region experienced a major rise in violence associated with competition between various criminal organizations, the Mexican government’s efforts to dismantle these groups with a presence in the border region, and—at least indirectly—in response to U.S. border security policy. In

particular, the two largest Mexican border cities, Tijuana and Ciudad Juárez, both experienced major spikes in violence beginning in 2006 (Tijuana) and 2009 (Ciudad Juárez). Figure 2 below shows a spike in homicides in Ciudad Juárez during 2011. It was statistics such as these that captured headlines around the world, particularly after horrific crimes such as the mass homicide of 15 young people in Ciudad Juárez in January 2010.

More recently, first Tijuana then Ciudad Juárez saw homicide rates decline from their historic highs as conflicts between criminal organizations have been resolved and local and federal governments have invested massively in law enforcement and social programs. Nevertheless, government data also suggests some of the violence has been displaced farther east and south, and new conflicts have erupted between criminal organizations. In any case, the nature, intensity and frequency of the violence in key Mexican border cities had a major impact on quality of life for citizens in those communities and were the subject of fierce debate in Mexico and the United States. It continues to have an impact on public policy thinking at the highest levels in both countries. Ciudad Juárez is of continued interest to policymakers and citizens alike.

Figure 2: Homicides in Mexico Border Region Cities, 2012
Focus on El Paso/Ciudad Juárez

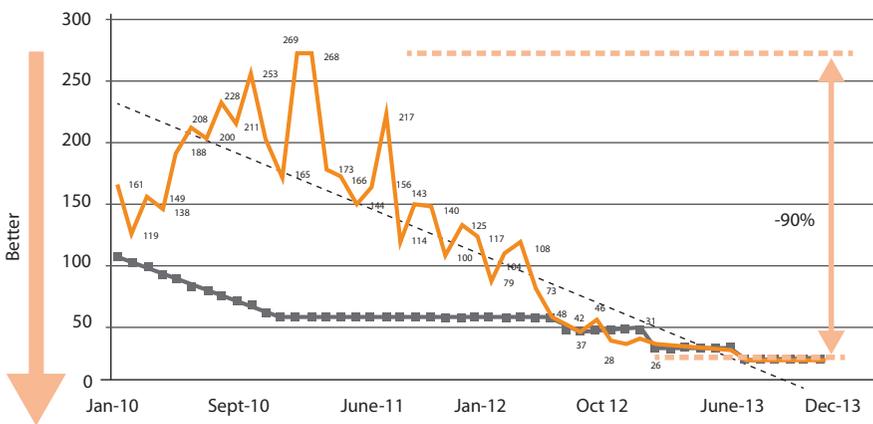


Source: Cory Molzahn, Octavio Rodriguez Ferreira, and David A. Shirk, *Drug Violence in Mexico: Data and Analysis Through 2012*, San Diego: University of San Diego, Trans-Border Institute, February 2013, <http://justiceinmexico.files.wordpress.com/2013/02/130206-dvm-2013-final.pdf>.

More than any other sister cities along the U.S.-Mexico border, El Paso, Texas and Ciudad Juárez, Chihuahua typify the stunning and puzzling asymmetries in security between the United States and Mexico. While crime statistics underscore the very low homicide rate in El Paso (a total of 16 in 2011 according to the FBI), Ciudad Juárez has suffered greatly from the competition and violence between Mexican criminal organizations in terms of its high homicide rate as well as spectacular crimes that have repeatedly put it in the global spotlight. The city's problems stem from a complex web of local and transnational criminal actors as well as local, state and federal governance challenges that are beyond the scope of this paper.

A combination of federal, state and local governmental and civil society efforts have served to reduce various measures of criminality in Ciudad Juárez over the past several months. These efforts—in addition to ever-changing balances of power between criminal organizations—have resulted in a general reduction in crimes such as homicide, aggravated automobile theft (carjacking), and extortion, among others. In Figure 3 below, we see an overall downward trend in one of the most closely watched crime indicators for Ciudad Juárez: homicides.

Figure 3: Homicide Rate in Ciudad Juárez, January 2010-January 2013



Source: Mesa de Seguridad de Ciudad Juárez, Chihuahua. <http://www.mesadesseguridad.org>

As the principal causes of falling U.S. crime rates since the 1990s are the subject of considerable debate among law enforcement analysts in the United States, the same is true of Mexico. Falling homicides in Ciudad Juárez are variously ascribed to government efforts or reassertion of control over the city by the relevant organized crime groups. Local stakeholders in Ciudad Juárez interviewed for this working paper repeatedly cited increased cooperation between the various levels of government. Particular emphasis was given to the ways in which President Felipe Calderón and Chihuahua Governor César Duarte—hailing from the PAN and PRI, respectively—were able to join efforts under the Todos Somos Juárez framework for rebuilding civil society and enhancing public safety.

Seizures of Dangerous Drugs, Money and Firearms at the Border

Another key indicator used by government agencies to document progress on combatting dangerous flows of drugs, firearms or money that funds illicit activities are seizures of these items. According to testimony by representatives from U.S. Customs and Border Protection before the House Committee on Homeland Security on April 17, 2012, “DHS seized 74 percent more currency, 41 percent more drugs, and 159 percent more weapons along the southwest border as compared to FY 2006-2008.” Their assessment was offered as evidence of the agency’s approach to border security.¹⁶

Yet, despite these impressive numbers, seizures at the border have proven to be an unreliable measure of effectiveness in stanching the flow of drugs, money and firearms. For one, it’s difficult to determine the relative importance of the reported seizure amounts since these are generally reported as gross amounts with no explanation of what percentage of the total amount trafficked these seizures represent. For example, seizures of cocaine were over 18,000 kilos in 2010 yet it is difficult to know what percentage this represents of total cocaine entering the United States. Furthermore, making year-to-year comparisons to determine whether the percentages seized are increasing or decreasing is also very difficult to determine. Seizures may increase or decrease in total volume, but it’s less clear if the increase in volume seized also represents a similar percentage increase.

Even when using the most generous, albeit questionable, government estimates of total illicit traffic, seizures would appear to represent a very tiny percentage of the estimated number or volume of the illegal items passing through the border. Given the extraordinary resources – personnel, technology, and finances – deployed at the border one has to ask whether the cost-benefit ratio justifies additional investments to simply catch a minuscule percentage of illegal money, firearms or drugs crossing the border. Put another way, does it make sense to invest an additional million dollars for more inspections if one can reasonably expect to recoup a small fraction of that investment in additional seizures? Ultimately, the question is whether the border is the best place to stop these illegal flows or whether a strategic enforcement approach away from the border is more rational and cost-effective.

The following summarizes information that is publically available about seizures of illegal drugs, firearms and bulk cash at or near the border. As can be observed, much of the information is fragmented between governmental agencies and specific information about seizures at the border is often unavailable or not disaggregated by the government of either country.

Illegal Drug Seizures

As the chart below indicates, cocaine seizures have decreased over the last five years although there has been a gradual uptick in the past two years. By contrast, heroin and marijuana seizures have been increasing steadily during this period, and a dramatic increase in methamphetamine seizures was reported, growing by 55.55% from 2,918 kilograms to 5,253 kilograms in five years. This may reflect the Mexican cartels' increasing involvement in the methamphetamine trade and the drug's increasing popularity among consumers. The UNODC 2012 Drug Report notes that, "North America accounted for roughly half of global methamphetamine seizures in 2010, reporting 22 tons of seized methamphetamine. The biggest increase was reported in Mexico where seizures doubled from 6 tons in 2009 to almost 13 tons in 2010, but methamphetamine seizures also rose significantly in the United States from 7.5 to 8.7 tons in that period."¹⁷

Table2. U.S. Illegal Drug Seizures Along the Southwest Border

(in kilograms)¹⁸

	CY2005	CY2006	CY2007	CY2008	CY2009	CY2010
Cocaine	22,653	28,284	22,656	16,755	17,583	18,623
Heroin	228	489	404	556	839	1,062
Marijuana	1,034,102	1,146,687	1,472,536	1,253,054	1,859,258	1,718,424
Methamphetamine	2,918	2,798	1,860	2,201	3,788	5,253
Total	1,059,924	1,178,274	1,497,495	1,272,658	1,881,548	1,743,421

Source: CY2005 – CY2008 data are from the U.S. Department of Justice, National Drug Intelligence Center, National Drug Threat Assessment 2010, Product No. 2010-Q0317-001, February 2010, p.20, <http://www.justice.gov/ndic/pubs38/38661/38661p.pdf>. The NDIC uses data from the National Seizure System. CY2009 and CY2010 data were provided to CRS by the NDIC.

The National Drug Intelligence Center reported in 2011 that most drugs are seized along the Southwest border. To be specific, they found that in 2010, 96% of marijuana, 80% of methamphetamine, 64% of heroin and 58% of cocaine seizures took place in this region.¹⁹

Money

Although stemming the flow of cash across the Southwest border is one of the key elements of the White House’s National Southwest Border Counter-narcotics Strategy, it is believed that less than .20% of illicit cash that crosses the border is actually seized. If one starts with the U.S. government’s 2010 estimates of the amount of money being laundered back to Mexico and Colombia (between 19 and 29 billion) and then takes the estimates for cash seizures in the U.S. (\$32.4 million)²⁰ and Mexico (\$7 million)²¹ from 2010, which was \$39.4 million, then one can see how less than .20% was seized; this is using the lower estimate of how much money is being laundered into Mexico. If one accepts the government’s estimate that as much as half is being returned as bulk cash then .37% of the cash was seized in 2010.

The official numbers are suspect and the amount of bulk cash seizures at the border are difficult to determine since there is no single agency that aggregates the data on these seizures.²² Instead, there are a number of reports that provide data on overall seizures but do not specify where these occurred. It is only an assumption, maybe reasonable, that these seizures mostly took place along the Southwest border. For example, according to the 2011 National Drug Intelligence Center Report, bulk cash seizures in the U.S. totaled \$798 million from January 2008 through August 2010, an average of approximately \$25 million per month. The same report states that these seizures were predominantly in the border states of Texas, California, Arizona, New Mexico, or actually occurred in Mexico. Likewise, according to a 2010 Washington Post article, the Department of Homeland Security seized \$85 million along the southwest border in 2009.²³ ICE also implemented an initiative along the border called Operation Firewall which specifically tries to halt the flow of cash into Mexico; according to a statement by James Dinkins, the Executive Associate Director of Homeland Security Investigations to the Senate Committee on Homeland Security, the Operation enabled ICE to seize more than \$504 million between 2005 and 2009.²⁴

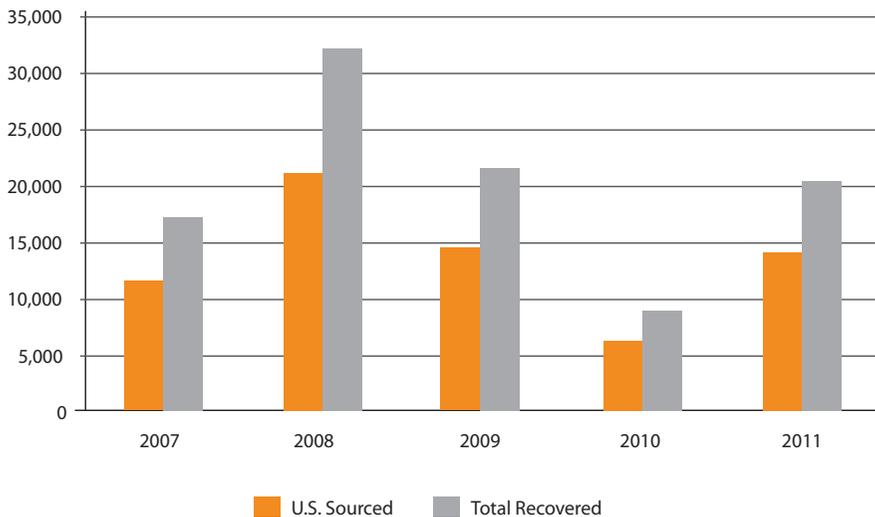
In each of these cases it is impossible to draw specific conclusions about where the seizures are taking place although it seems reasonable to assume that the majority are happening in the border region. More importantly, however, may be the conclusion that the amount of bulk cash being seized is quite small even when one starts with the low end of the government's own estimates of the total volume.

Firearms

One hears often that American guns are contributing the cartel-related violence in Mexico, but actually tracing the firearms and where they enter Mexico, not to mention stopping them before this occurs, is very difficult. As is shown in Figure 4 below, up to 65.5% (taking the 2008 high) of the firearms recovered by Mexican security and law enforcement and then traced are U.S. sourced. Some are manufactured and sold in the United States and others are first im-

ported to the United States, eventually making their way into Mexico. Additionally, the majority of firearms enter Mexico illegally through five southwest border ports of entry, namely, San Diego, Nogales, El Paso, Laredo and McAllen,²⁵ and 69% of traced firearms were originally purchased in Texas, California and Arizona.²⁶

Figure 4: U.S. Sourced Firearms Recovered in Mexico, 2007-2011



Source: U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives, "ATF Mexico: Calendar Years 2007-2011," Report #123876, <https://www.atf.gov/files/statistics/download/trace-data/international/2007-2011-Mexico-trace-data.pdf>.

How many weapons are specifically seized at the border, as is the case with cash, is enormously difficult to determine because various agencies are involved in these seizures including local law enforcement, the ATF, CBP and occasionally ICE in the U.S.; as well as the Mexican military, Attorney General's office, and state authorities. The information available is mostly from individual U.S. government agencies; there is no consolidated data, and there are no reports from Mexico on border seizures.

The information on firearm seizures at the border is mostly fragmented and often not specific to the border. The ATF reports that since the beginning of

Project Gunrunner, an operation along the southwest border which specifically targets weapons trafficking into Mexico that began in 2006, they have seized, “over 10,000 firearms and nearly one million rounds of ammunition destined for Mexico.”²⁷ In 2009, at a DHS and ATF summit, officials revealed that between July and September 2009, CBP and ICE seized 65% more weapons along the border than in the same period the previous year, and that in the last 6 months of fiscal year 2009 they seized more than 50% more than in the last six months of fiscal year 2008.²⁸

As with illegal drugs and bulk cash, it has been impossible to develop a comprehensive picture of firearm seizures at the border by either Mexican or U.S. authorities.

Increased Efforts Aimed at Apprehensions of Undocumented and Unauthorized Migrants: New Staffing, Infrastructure and Technology

The U.S.-Mexico border region is an enormous geographical space, with the international boundary extending 1,954 miles –much of it in extremely remote desert and mountainous terrain. It is a challenging space for the two nations to manage.

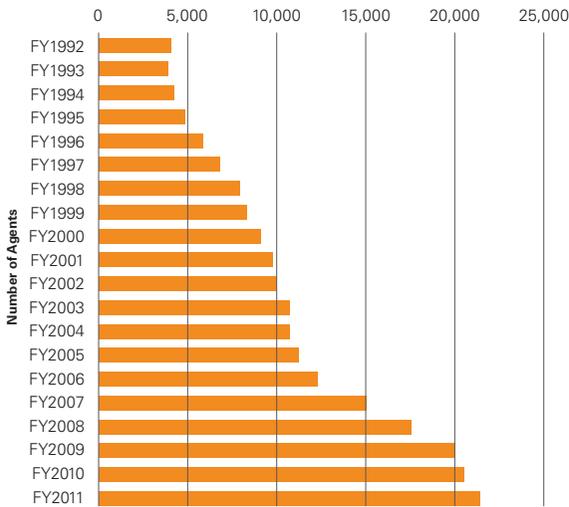
In the U.S. a large number of federal agencies have a say in border security affairs, though historically it is the U.S. Border Patrol that has had the highest public profile in security matters on the border.²⁹ The Border Patrol’s actions drive a large portion of the public discussion on border security. Its focus on staffing, infrastructure and technology has significantly shaped what the border looks like today. For these reasons it is worthwhile to spend a significant amount of time examining the U.S. Border Patrol.

Ultimately, the question is whether the border is the best place to stop these illegal flows or whether a strategic enforcement approach away from the border is more rational and cost-effective.

Staffing

As the profile of the U.S. Border Patrol has expanded, so, too, has its funding and particularly its staffing. As seen in Figure 5 below, Border Patrol staffing has undergone a significant increase since the early 1990s. From fiscal year 1992 to fiscal year 2011, staffing expanded by 17,305 agents, a 518 percent increase over two decades. The increase was given particular emphasis during the FY2007-FY2011 period, when two major trends came together to prompt Congress to increase staffing between the ports of entry. These include the failure of comprehensive immigration reform in the U.S. Congress as well as increasing violence in Mexican border cities such as Tijuana and Ciudad Juárez as one of the byproducts of stepped-up pressure on transnational criminal organizations by President Felipe Calderon’s administration beginning in December 2006.

Figure 5: U.S. Border Patrol Staffing, Fiscal Years 1992- 2011



Source: U.S. Customs and Border Protection, http://www.cbp.gov/linkhandler/cgov/border_security/border_patrol/usbp_statistics/usbp_fy12_stats/staffing_1993_2012.ctt/staffing_1993_2012.pdf.

As staffing has peaked, we have discovered something unexpected: as measured by apprehension statistics, unauthorized immigration is way down from its peak in a number of the Southwest border sectors. A number of researchers, including Douglas Massey of the Mexican Migration Project at Princeton, have argued that Mexican migration to the U.S. is now at net zero, that is, roughly the same numbers of Mexicans are returning to Mexico as are entering the United States. Various reasons have been given for this largely unexpected development, including a weak U.S. economy, a relatively strong Mexican economy, enhanced border deterrence and increasingly dangerous conditions for migrants in key corridors.

While it is difficult to predict future flows of migrants, we seem to be at or past a point of diminishing returns in terms of improving border security through increases in Border Patrol staffing.

This is demonstrated by the fact that U.S. Border Patrol apprehensions in FY 2012 were down in a number of key sectors from even the low standards of 2011. To take one example, as is seen below in Table 3, during FY2012 in the El Paso sector there were only 9,678 apprehensions, down from a peak of 285,781 in 1993. San Diego apprehensions in FY12 were at 28,461, down from their peak of 565,581 in FY92. And perhaps most remarkably, Tucson Sector apprehensions FY12 were down to 120,000 from a peak of 616,346 in FY 2000.

Table 3: U.S. Border Patrol Apprehensions for Southwest Border Patrol Sectors, FY 2011 and FY 2012

Sector	Staffing	FY 2011 Apprehensions	FY 2012 Apprehensions	Peak Apprehensions 1992-2011/year
Big Bend	667	4,036	3,964	15,486 (1998)
Del Rio	1,626	16,144	21,720	157,178 (2000)
El Centro	1,164	30,191	23,916	238,126 (2000)
El Paso	2,738	10,345	9,678	285,781 (1993)
Laredo	1,871	36,053	44,872	141,893 (1997)
Rio Grande Valley	2,504	59,243	97,762	243,793 (1997)
San Diego	2,669	42,447	28,461	565,581 (1992)
Tucson	4,239	123,285	120,000	616,346 (2000)
Yuma	969	5,833	6,500	138,438 (2005)

Sources: United States Border Patrol Apprehensions / Seizure Statistics - Fiscal Year 2011, http://www.cbp.gov/linkhandler/cgov/border_security/border_patrol/usbp_statistics/fy_profile_2011.ctt/fy_profile_2011.pdf and United States Border Patrol Southwest Border Sectors Total Illegal Alien Apprehensions By Fiscal Year, http://www.cbp.gov/linkhandler/cgov/border_security/border_patrol/usbp_statistics/usbp_fy12_stats/appr_swb.ctt/appr_swb.pdf.

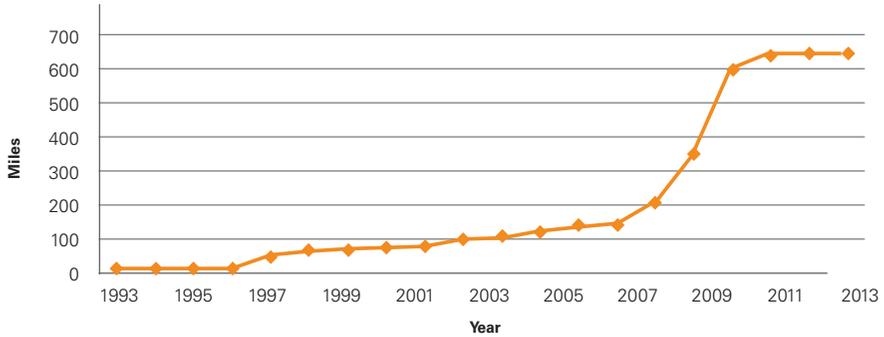
While it is difficult to predict future flows of migrants, overall we seem to be at or past a point of diminishing returns in terms of Border Patrol staffing. This is significant because of the enormous expenditures to increase staffing for the U.S. Border Patrol over the past twenty years as is demonstrated in Figure 6 above and the emphasis during this period on securing the areas between the land ports of entry (which is the specific jurisdiction of the Border Patrol).

Infrastructure

The construction of infrastructure between the Ports of Entry (POE) along the U.S.-Mexican border has been an uneven process and tends to happen in bursts of activity in reaction to a perceived need for greater border security. Operation Gatekeeper and Operation Hold the Line were implemented by the Clinton Administration in the San Diego and El Paso regions respectively in the mid-1990s partly in response to local concerns over illegal immigration. These

programs began a new era of security infrastructure along the border which was characterized by reinforced fencing, increased lighting and use of various types of sensors to detect and deter illegal crossing between the ports of entry. Figure 5 below shows the dramatic increase in fence building that corresponds with the increase in staffing beginning in 2007.

Figure 6. Total Miles of Border Fencing, 1993-2012



Source: Marc R. Rosenblum testimony, “Measuring Border Security: U.S. Border Patrol’s New Strategic Plan and the Path Forward,” Committee on Homeland Security, Subcommittee on Border and Maritime Security, May 8, 2012.

TRUSTED SHIPPER AND TRAVELER PROGRAMS: PART OF THE ANSWER TO SHARED SECURITY AND ECONOMIC GROWTH IN THE BORDER REGION

Moderate investments to update infrastructure and to fully staff the ports of entry are certainly needed, as long lines and overworked staff promote neither efficiency nor security. But in a time of tight federal budgets, asking for more resources cannot be the only answer. Strategic efforts that do more with less, improving efficiency and reducing congestion, are also needed. Trusted traveler and shipper programs (SENTRI, FAST, C-TPAT) allow vetted, low-risk individuals and shipments expedited passage across the border. Improving these programs and significantly expanding enrollment could increase throughput with minimal investments in infrastructure and staffing—all while strengthening security by giving border officials more time to focus on unknown and potentially dangerous individuals and shipments.

—Erik Lee and Christopher Wilson, “The State of Trade, Competitiveness and Economic Well-Being in the U.S.-Mexico Border Region”

Strengths and Weaknesses of the U.S.-Mexico Land Ports of Entry

The chapter in this report on trade, competitiveness and economic well-being in the U.S.-Mexico border region laid out the principal challenges facing U.S.-Mexico land ports of entry, which function both to facilitate commerce between the two nations but also as security “membranes” (keeping out what we don’t want but allowing and hopefully facilitating legitimate trade and travel). These challenges include aging infrastructure, little to no funding to improve existing infrastructure and add needed infrastructure, and trusted travel and shipper programs that need to grow significantly to improve both security and trade. On the U.S. side of the border, the land ports of entry are under the jurisdiction of the Office of Field Operations, which evolved from the U.S. Customs Service as it was absorbed into Customs and Border Protection under the U.S. Department of Homeland Security.

The Impact of Technology on Border Security

As discussed above, infrastructure and staffing levels along the border have increased dramatically in the last decade. The U.S. federal government in particular has made significant investments in technology in the hopes of enhancing its results, gaining a significant return on investment and defending the United States from all threats. And much the same as we have seen with the border security areas discussed above, the public discussion over the what, where, why and how of technological investment is the subject of fierce debate. In general, though, the premise—that technology, which has proven such a game-changer in other areas of modern life, should also return value in border security—is a solid one. Additional developments in this area promise to be of great interest to observers of border security. Of additional interest is how additional technology can be folded into tightening federal budgets—particularly in the United States—and whether falling apprehensions of undocumented migrants at the border will justify additional investment in this area.

Conclusion

The state of security in the U.S.-Mexico border region is one of asymmetry, transition, and ambiguity. Without a doubt, the U.S. and Mexican federal governments have made large investments in staffing, infrastructure and technology and have reorganized and refocused efforts to respond to specific threats and events. Yet gains in areas such as apprehensions of undocumented migrants and reductions in violence in key cities such as Ciudad Juárez seem tenuous at best and beg for more comprehensive, creative and collaborative solutions between these two countries, one a superpower and the other a key emerging power.

What's Needed Most: Creativity, Capacity-building, and Collaboration

As the two nations become more intertwined economically and people-to-people ties become more intense, the federal governments, the border states and communities will have to find new, creative and robust ways to increase public safety in the U.S.-Mexico border region. This will require both greater capacity at the state and local level as well as greater creativity, a more realistic, longer timeframe for policy implementation and leadership at the federal level. Although both countries have recently achieved new levels of collaboration—codified into official policy with the remarkable May 19, 2010 Joint Declaration on Twenty First Century Border Management by President Barack Obama and President Felipe Calderón—the U.S. and Mexico have only recently begun to make real progress on a binational security regime that would be “built to last.”

Lasting progress in U.S.-Mexico border security can only come from both increased bilateral collaboration as well as independent domestic progress on key issues affecting security by the U.S. and Mexican publics. One key collaborative objective that needs increased attention and creative solutions is border management, particularly in the context of an extremely constrained fiscal environment in the United States. The two governments—in close collaboration with border communities—must use all current and additional creative means at their disposal to make the land ports of entry from San Diego/Tijuana to Brownsville/Matamoros as safe

and efficient as possible to enhance both our physical and economic security. There have been remarkable experiments in implementing already existing technology, particularly between the ports of entry with highly controversial initiatives such as SBInet. Yet the governments have yet to employ this technology in a game-changing way to make the land ports of entry true platforms for economic security rather than highly congested and bureaucratized nodes in our North American commercial network.

Depressurizing and Innovating in the Border Region

In general, the more the two governments can push key security processes away from the border, the better, as an overconcentration of resources at the border (and particularly between the ports of entry) has the potential to distract from a more strategic distribution of security resources throughout the U.S., Mexico and beyond. There remains much work to do in this area, but several key challenges stand out, including enhancing intelligence sharing between the U.S. and Mexico, implementing justice reform in Mexico, disrupting the flow of firearms and bulk cash southward into Mexico as well as the flow of migrants, victims of human trafficking and illicit substances northward into the United States.

Enhanced collaboration on implementing Mexico's justice reform—the shift to an effective oral adversarial system of justice—and professionalizing Mexico's multiple law enforcement agencies should be top priorities for promoting better security in the border region. Likewise, the United States needs to demonstrate much greater progress in reducing illegal drug consumption at home by identifying and funding effective prevention and treatment programs. Moreover, the politically sensitive issues of disrupting firearms trafficking from the United States to Mexico and disrupting money laundering schemes within the U.S. financial system must also be a greater priority if collaboration is to become a two-way street. Together, these challenges will require innovation and creativity amongst policymakers to ensure that the many competing interests and concerns that affect the border do not result in a region locked in inefficiency but one that can reach the potential dynamism that it rightfully represents.

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CHAPTER 4: THE STATE OF SUSTAINABILITY AND THE EVOLVING CHALLENGES OF MANAGING THE U.S.-MEXICO BORDER ENVIRONMENT

Carlos A. de la Parra

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EXECUTIVE SUMMARY

Within the overall U.S.-Mexico relationship, addressing border environmental issues is not the highest priority for the two federal governments. The framework for cooperation is relatively new—only 30 years old in 2013—and has focused on reacting to pollution-centered crises rather than natural resource management or sustainability. The two countries engage in cooperation through either a *centralized* format, such as the International Boundary and Water Commission; a *decentralized* format, i.e., the La Paz Agreement, or *binational institutions* such as the Border Environmental Cooperation Commission (BECC) and the North American Development Bank (NADBank), but often seem to underutilize all three on critical matters such as the disruptive effects of the border wall.

This chapter of the *State of the Border Report* focuses on the evolving nature of U.S.-Mexico cooperation regarding the environment, and argues for the need to shift the emphasis from pollution control to more comprehensive natural resource management. Ultimately, we believe that it is imperative that both nations reconsider the importance of the region's sustainability as part of its quest to promote our shared competitiveness and security. In that regard, we recommend that state and local governments adopt a more proactive, visionary and holistic, and less reactive approach to environmental management, similar to the vision expressed by decision makers

of the Ten Border states while compiling the Strategic Guidelines document in 2009.¹

Water conservation must be implemented as part of a regional water management strategy to reduce dependency and the energy needed to import water from outside natural water basins and to provide for environmental flows for ecosystem enhancement. States and municipalities must engage in fulfilling the region's enormous potential for generating renewable energy, its "natural mandate" given its geographical, socioeconomic and geopolitical conditions, and live up to its potential for competitive and sustainable development.

SUSTAINABILITY

Introduction

The concern of both nations over environmental quality at their common border is relatively new, relatively low on the list of priorities of both capital cities, and ostensibly reactive. In comparison with the framework for managing shared U.S.-Mexico water resources, which has been in existence for over a century, joint efforts to control environmental pollution are less than 30 years old, and research and analysis on the region's sustainability are in their infancy. In the years following the United States-Mexico Environmental Cooperation Agreement, also known as the La Paz Agreement,² which was the first U.S.-Mexico environmental cooperation framework signed by the two countries, successive border environmental programs were created to address pollution problems along the border. But funding for border projects competes for scarce resources against other national priorities on both sides of the border, as evidenced by the shrinking funds in the Border Environment Infrastructure Fund, which saw appropriations from the U.S. Congress drop from a high of one hundred million dollars per year in the mid-Nineties to levels of less than twenty million by 2008.³ The long term stability of U.S. funding for border affairs remains highly susceptible to the political priorities of Congress and/or the White House.

Despite these shrinking resources, there is growing recognition that sustainability cannot be disassociated from security, quality of life, or economic development. Indeed, sustainability of the environment provides the basis for quality of life in terms of health, jobs, and sustainable security. Throughout the three decades of bilateral cooperation on environmental quality, issues and priorities along the border have evolved. A deficient water and sewerage infrastructure is no longer the main cause of pollution along the border, nor is pollution, *per se*, the environmental issue of greatest concern for both governments. In the 1980s, cross-border pollution had become a liability in U.S.-Mexico relations. It was problematic in San Diego, as sewage from Tijuana overflowed into the sensitive Tijuana River Estuarine Reserve on the U.S. side; it was an issue in the Arizona-Sonora area, as the copper smelters in Douglas, Arizona and

Nacozari, Sonora polluted common regional air quality with sulfur dioxide; and it was an issue in Tecate, B.C. and Matamoros, Tamaulipas when hazardous waste from U.S. firms began appearing illegally in Mexican rural areas. But successive U.S.-Mexico environmental programs⁴ under the La Paz Agreement provided joint interventions by both federal governments, strengthened by state government investments in the latest multi-year program, building greater knowledge and capacity to control pollution at the border.

Additionally, as part of the North American Free Trade Agreement (NAFTA), the two countries agreed to create the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB) to help build up the necessary infrastructure to mitigate the environmental impacts of their increased cross-border trade.

Over time, population growth and economic expansion have become an increasing source of pressure on natural resources in the region, such as clean water, aquatic ecosystems, and wildlife habitat. Water scarcity and riparian habitat have become a main concern in the Colorado River and the Rio Grande watersheds, and climate variability and weather extremes are demanding innovative approaches and newer agreements in order to stave off a looming crisis. At the same time, security concerns after 9/11, as well as the political need to control immigration, made it imperative for the U.S. Department of Homeland Security to build infrastructure including a nearly 700 mile-long physical barrier that includes a steel wall and up to two vehicle roads along the international boundary line. The barrier affects the immediate hydrology of the area and impedes the free flow of wildlife species, some of them endangered, while curtailing their habitat.⁵ Furthermore, the border fence encroaches on environmentally sensitive areas in several stretches of the international border, such as the Tijuana River Estuarine Reserve and the El Pinacate and the Gran Desierto de Altar Biosphere Reserve in the Arizona-Sonoran Desert.

The previous description implies a shift in the importance of matters from pollution control to natural resource conservation and is the product of two paradoxical opposites: generous investment in water and sewer infrastructure for cities, with relative disregard for natural resource conservation in less populated rural and wilderness areas along the border.

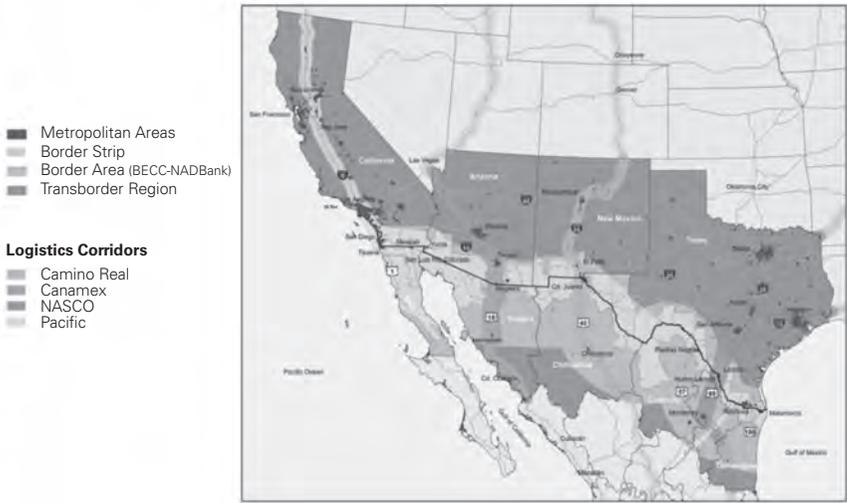
This chapter addresses issues of environmental quality, ecological integrity and equity along the border, with considerations for the sustainability of the region as a whole. We look at the institutional framework created by both federal government agencies responsible for carrying out the La Paz Agreement, Mexico's Secretariat of Environment and Natural Resources (Semarnat) and the U.S. Environmental Protection Agency (USEPA), and describe the general state of the environment in the region focusing on each of the elements (natural resources, energy, water, air, and waste) that contribute to healthy or hazardous landscape. The chapter concludes by reviewing the challenges to sustainability that the region must face, as well as suggesting measures of progress that can contribute to improving the overall quality of life for border residents.

Sustainability: Vision

The definition of sustainability that we have used in the development of this paper is one we believe takes into consideration the U.S.-Mexico border region, its past conditions and current situation, which is unique because of its particular geographical, social and ecological characteristics.

Sustainability is loosely defined as actions and projects today that do not jeopardize the ability of future generations to meet their aspirations. As a more rigorous definition within this chapter, we suggest sustainability has equally important components of social equity among people and across generations; ecological integrity and environmental quality; and economic opportunity and access to the resources that enable an equilibrated development. We also consider it important to apply this concept of sustainability to a region's development, regardless of the political divisions and cultural differences. This is because geopolitical maps almost never coincide with ecological regions or environmental macro divisions. The environment of the border region (Figure 1) is but one complex system (hydrological, ecological, atmospheric, climatic, energetic, etc.), which is, at the same time, a system intertwined with a broader socioeconomic system comprising industries and development areas (such as manufacturing, transportation, etc.). Managing to the triple bottom line formed by ecological integrity, environmental quality, and equal access to quality of life and environmental health is confounded at every turn by the other border functions.

Figure 1. The U.S.-Mexico Transborder Region.



Source: Border Governors Conference, *Strategic Guidelines for the Competitive and Sustainable Development of the U.S.-Mexico Transborder Region* (El Colegio de la Frontera Norte and the Woodrow Wilson Center Center for Scholars, Mexico Institute: Washington, 2009).

Efforts have been made to reach consensus on common trends and desires shared by stakeholders in the transborder region in order to form a shared vision of sustainability. Results from a survey applied in 2009 to residents and stakeholders of the 10 US-Mexico border states (local and federal levels, and from the governmental, academic, private and social sectors)⁶ shows that the elements that were shared by them to form such a common vision of sustainability were the following:

In general, the survey respondents agreed upon a *vision of sustainability* as a way to meet today’s needs in a socially equitable fashion without harming the ability of future generations to manage their own needs in the same way.

Regarding *water conservation*, the common future envisioned was one where the communities in the region will be mindful of the water-limited conditions,

adopt effective water conservation programs, and ensure equal access to clean water for everyone.

In terms of *enforcement and compliance*, respondents stated that they wanted a region where environmental authorities will rigorously and systematically apply environmental regulation and full compliance will become the norm in the region.

For *climate change action*, the vision that emerged from the respondents was of a binational action plan to increase energy efficiency and foster the use of renewable energy. For *comprehensive ecosystem management*, the region will develop and implement binational mechanisms to manage cross-border ecosystems.

The Evolving Nature of U.S.-Mexico Environmental Cooperation

During the 1980s, Mexico created its first environmental regulations⁷ and began opening up to international trade and strengthening institutions and evolving from its status as a developing nation to an emerging economy. While asymmetries in wages and municipal capacity still exist between the two nations, Mexico today is much better equipped to monitor and enforce regulations than it was a generation ago. The trends and general direction of environmental policies are strikingly similar, and the difference in environmental regulations, management and enforcement between United States and Mexico could be described principally as a difference in capacity. For example, the U.S. and Mexico have very similar air quality standards both for emissions and for ambient quality but different ability to monitor, enforce, prosecute, and penalize offenders. While U.S. decision making operates under federalism, with environmental policy tending to be fragmented, the Mexican system, while also a type of federalism, is more centralized, which means much of the influence comes from the national capital, with fewer resources made available to the state and local level.

In general, the U.S. and Mexico have settled into a three-path approach to environmental cooperation: *centralized collaboration*, which they exercise through their respective foreign ministries, and in the case of the border, the International Boundary and Water Commission; *decentralized collaboration*, which in essence is the La Paz Agreement that enables the environmental ministries with a minor foreign policy impact; and the *binational institutions*, namely BECC and the NADBank. All three paths to cooperation are present as the U.S. and Mexico manage the environmental borderlands, yet Córdova and de la Parra argue that all three are underutilized and are tested under contentious circumstances.⁸

The glaring weakness in the U.S.-Mexico environmental cooperation framework has been the absence of a comprehensive natural resource management and conservation program.

In that sense, part and parcel of the success achieved so far by successive U.S.-Mexico environmental programs has been recognizing these cross-border differences in the approach to funding and decision-making. As Mexican states have grown in political autonomy, the binational framework at the border has seen a shift in the level of responsibility assumed by states. The increased level of participation by the states was also facilitated in 2003 when the binational

Border 2012 program included the ten border states as formal stakeholders to act as co-chairs in each and every one of the program's four Regional Workgroups. These workgroups became the basic on-the-ground unit for decision-making in each of the four regions (California-Baja California, Arizona-Sonora, New Mexico-Chihuahua, and Texas-Chihuahua/Coahuila/Nuevo León), ultimately convening local Task Forces as grassroots units to perform the work needed. Having state authorities involved in deciding how to allocate funds and working to raise additional funds themselves provided a whole new dimension to the program and gave meaning to the promise of making the Border 2012 program a "bottom-up" effort.

The glaring weakness in the U.S.-Mexico environmental cooperation framework has been the absence of a comprehensive natural resource management

and conservation program. Since the La Paz Agreement, issues related to urban growth and cross-border pollution were given a unified formal outlet, while matters of conservation and natural resource management continue to be addressed through agency-to-agency dialogue. While there is no inherent reason to consider the interagency dialogue as deficient, having a bilateral program as a framework does provide a consensus mechanism for critical stakeholders to assess the state of the border on a given problem, and agree on the goals and the overall plan to accomplish objectives.

The prevailing circumstances in the 1970s and 1980s leading up to the La Paz Agreement indicated the need to address uncontrolled pollution and health issues of grave concern all along the border.⁹ Population growth on the Mexican side of the border increased dramatically during the 1960s, leading to many unincorporated settlements (*colonias*) on the periphery of urban areas with little or no infrastructure to manage their impact. The construction of water and sewer lines lagged behind the rate of population growth, given the migration to border areas generated by the employment boom of the Mexican government's Border Industrialization Program of the 1960s. In addition, hazardous waste began to appear unchecked in urban peripheries along the border,¹⁰ reflecting the risks of having a highly industrialized nation in proximity to a developing nation with a lesser degree of institutional capacity. In that respect, the La Paz Agreement and the programs that followed were an admirable antidote for improving Mexico's institutional capacity and infrastructure.

Eleven years after the La Paz Agreement, with the signing of the North American Free Trade Agreement (NAFTA), the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) became an additional mechanism for creating environmental infrastructure within the border region. Over the course of nearly three decades, the BECC-NAD-Bank binomial, as of November 2012, had reviewed, certified and funded 34 water distribution systems, 83 sewer collection systems, 41 new wastewater treatment plants and the upgrade or expansion of 15 existing plants, three water reuse systems, 16 landfills, 8.3 million square meters of paving, and was engaged in renewable energy projects. The majority of these actions were performed through the bilateral institutions, i.e., Border XXI/Border 2012/Border

2020 and the BECC-NADBank, and many received matching funds from the Mexican federal government and/or state governments.

Since the early 1990s, Mexico has gradually developed a new level of institutionalization, with state governments consolidating regulatory and enforcement branches. Still, both federal governments remain central to solving issues of water scarcity, wildlife habitat or endangered species because (a) there is no border-wide, regional program to deal with the joint management of natural resources, and (b) many of these issues remain under federal jurisdiction in Mexico, leaving any institutional arrangement up to a federally created framework. On the U.S.-side, the Department of Interior (DOI), the agency in charge of natural resource management, pulled out of the U.S.-Mexico environmental program structure as Border XXI expired (2000). In its stead, DOI limited its collaboration with Mexico to the *Border Field Coordinating Committee*, a less collaborative effort created in 1994 composed of several DOI divisions¹¹ and no Mexican representation. So, while Mexico's SEMARNAT continues to handle matters of water supply (through the National Water Commission, CONAGUA) and conservation (through the National Commission for Protected Natural Areas, CONANP), the absence of DOI in the overall border framework leaves SEMARNAT without an equivalent counterpart.

Factors Defining the Sustainability of the Border Area

The border area is overwhelmed by demographics both from natural momentum as well as migration, creating unplanned, unregulated, and unincorporated neighborhoods along the periphery of many cities. The rapid growth rate challenges not only infrastructure development but emergency preparedness and response capacity as cities continue to expand. As many of the new residents are younger, they perpetuate the faster growth of the region, especially in the cities. This evolution of the border region fosters production and consumption, as in all urban societies, and has created additional pressures on the natural resource base. Consequently, it is becoming increasingly difficult to supply the necessary services to the growing population in a planned fashion, one that would respect the desired vision of sustainability for the region.

This means that even as valiant and successful efforts by both sides address the environmental impacts of decades past, new challenges will persist and even newer ones will emerge. It is estimated that between US\$12 billion and US\$20 billion of investment in environmental infrastructure will be needed over the next 20 years.¹²

Transborder Environmental Influences and their Impacts Assessments

The notification of environmental impacts of projects that transcend borders remains a seemingly perpetual example of how far apart the two nations and their states and counties/municipalities are on basic environmental principles. Transboundary Environmental Impact Assessments (TEIA) are important to initiate and facilitate the process of monitoring on both sides of the border, minimizing impact from one side to the other, mitigating where it is most cost-effective, and jointly managing the system. In other words, TEIA enable the fundamentals of environmental stewardship to occur systemically. Several examples below illustrate their importance.

The first example is the lining of the All-American Canal that travels along the northern edge of the California-Baja California border. This water supply canal flows from the Colorado River west into the agricultural area in the Imperial Valley. It was built in an era when such canals were earthen, allowing some seepage into the groundwater. This seepage maintained groundwater levels on both sides of the border, allowing farmers in the Mexicali Valley to continue to draw from their wells and for natural habitats to support endangered species. When the US side decided to line the canal with cement to save water (to transfer it to the thirsty populations on the coast), Mexico quickly realized there would be a groundwater supply and salinity issue. Had the United States conducted and shared an extensive TEIA, it could have recognized and communicated the impact early enough in the process to arrange mutually beneficial, least-cost alternatives.

During the California energy crisis a private electricity provider recognized that building another power plant on the US side could not occur because of ambi-

ent air quality standards would have been exceeded. It requested and received permission from Mexico to build the power plant in Mexico close enough to the border to export all of its electricity to the US. The natural gas for the plant was to be provided by a pipeline leading from the US side. In essence, pollu-

tion was exported to Mexico while the benefits accrued to the US. Had the United States side conducted a TEIA to consider the health effects when it was assessing the other impacts of the natural gas line, a collaborative environmental health-protecting solution could have been reached.

The downsides of these mostly unilateral and in many cases federal actions can be minimized and mitigated through better flow of information across the border before projects are built. The first step is for each jurisdiction to view itself not unilaterally but part of an inter-jurisdictional and in some cases international system.

Energy, biodiversity, water, air quality and waste management stand out

as the critical issue areas in border sustainability. A discussion of each of the issues follows.

Energy

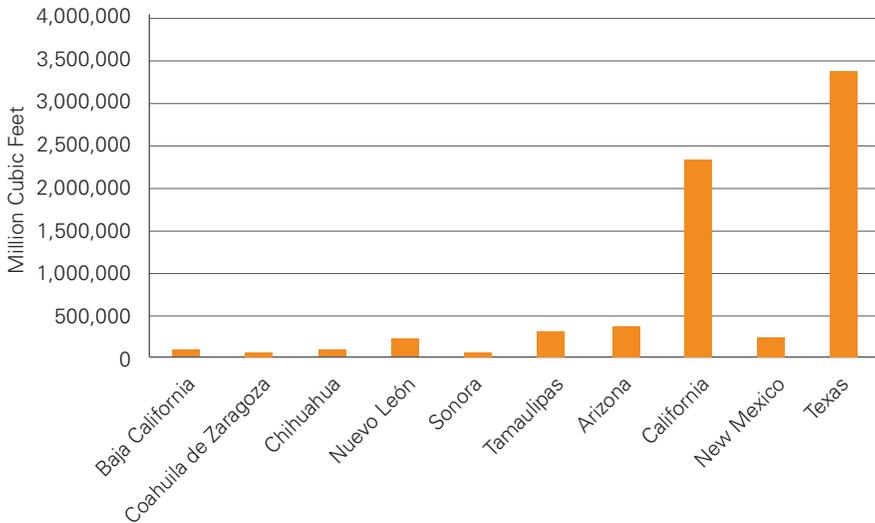
The U.S.-Mexico border region has traditionally been seen as energy-poor, but developments in natural gas and renewable energy are quickly changing the scenario. The region has petroleum and natural gas reserves in east Texas, Tamaulipas, and parts of Nuevo León and Coahuila, with refineries dotting the border. Some of these refineries send cleaner fuels back to Mexico after receiving crude

The downsides of these mostly unilateral and in many cases federal actions can be minimized and mitigated through better flow of information across the border before projects are built. The first step is for each jurisdiction to view itself not unilaterally but part of an inter-jurisdictional and in some cases international system.

petroleum from *Petróleos Mexicanos* (PEMEX) and other sources. However, natural gas and clean energy consumption is low in most states within the region, with liquefied petroleum gas and heavy oil providing the bulk of energy to all of the Mexican states. Only California and Texas show a higher degree of natural gas consumption (Figure 3), with very poor investment levels in renewable energy with the exception of Baja California and California (wind energy).

According to the California Energy Commission, about 50% of natural gas consumption for the year 2006 went to electricity generation in the state. Residential use of this resource took up only about 22%, from which almost 90% was used for space and water heating. California depends importantly on natural gas because it accounts for about a third of its energy requirements, although only 13.5% of its natural gas supply is in-state produced.¹³

Figure 2. Natural Gas Consumption per State (2009)



Source: U.S. Energy Information Administration and Secretaría de Energía, *Prospectivas del Mercado de Gas natural 2010-2025*

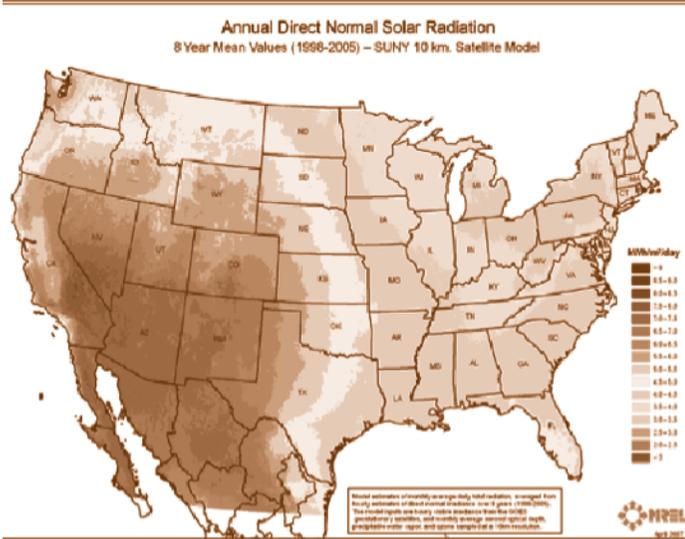
By 2010, Texas consumed more than three trillion cubic feet of natural gas, of which just a little over 3% goes to residential use. On the other hand, the

industrial sector and the electricity producing sectors were each using up to 40% of the total natural gas consumed in the state.

For cost-effective operation and development of clean, sustainable energy anywhere in the world, it is necessary, or at least very helpful, to have the proper natural resources that can fuel such technologies. This is the case of the US-Mexico border region, where most of the territory of the 10 border states is rich in alternative energy potential. However, the region suffers poor transmission capacity and few interconnections between the two nations.

As seen in figure 3, concentration of solar radiation in the Southwestern states of the US and in the Northwestern Mexican states is the highest within the two countries, especially in Arizona, Baja California, California, Chihuahua, Coahuila, Sonora and New Mexico, giving the region a privileged opportunity to produce energy from solar power technology.

Figure 3. Annual Direct Normal Solar Radiation in the US-Mexico Border Region.



Source: NREL (National Renewable Energy Laboratory), US Department of Energy, 2011.

Figures 4 and 5 show winds speed intensity in both countries at a height of 80 meters. The color scales on both maps are different, but nevertheless, it helps us visualize areas that are noticeably apt for wind power development. In the United States, the highest intensity area extends from the Dakotas in the north, all the way south to Texas and New Mexico. In Mexico, there are three important areas with high wind intensity, two of them in the northern border states. One of these areas covers most of the state of Tamaulipas and parts of the states of Nuevo León and Coahuila. The other area comprises the mountainous areas of Baja California, again giving the US-Mexico border region a strategic potential for the development of yet another sustainable energy source.

To date, only the states of Baja California and Tamaulipas in Mexico have developed projects for wind power generation, although the state of Nuevo León has already carried out a study to identify the state's areas with high wind power potential, as described in the document *Wind Energy Potential in Mexico's Northern Border States*.¹⁴ Further benefits from the development of these types of energy would be the possible creation of clusters for manufacturing wind and solar power technologies in the region, creating jobs and using the region's available human capital.

Differences between the U.S and Mexican regulatory systems for development and distribution of electricity frustrate efforts by various policymakers to facilitate renewable energy development. Recently the BECC and NADBank have become involved in such activities with promising results. Investment in the U.S is encouraged by tax credits and production, but the highly centralized nature of regulation in Mexico leaves few incentives for private developers.

Figure 4. US Annual average wind speed at 80 m.

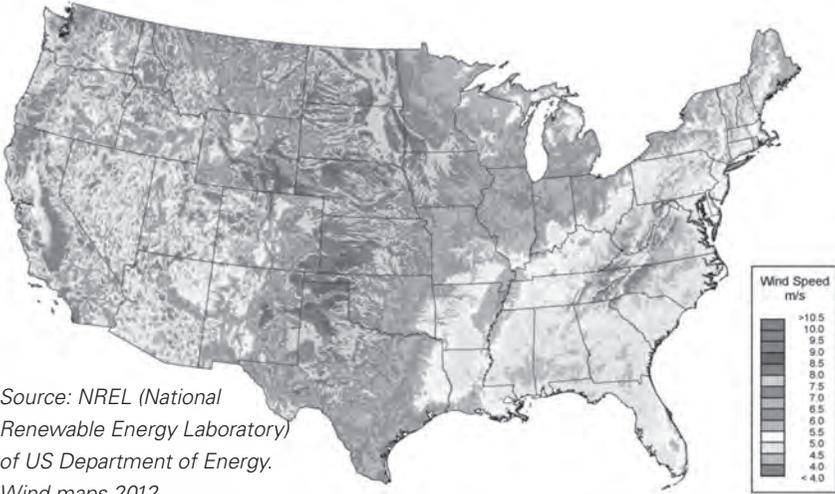
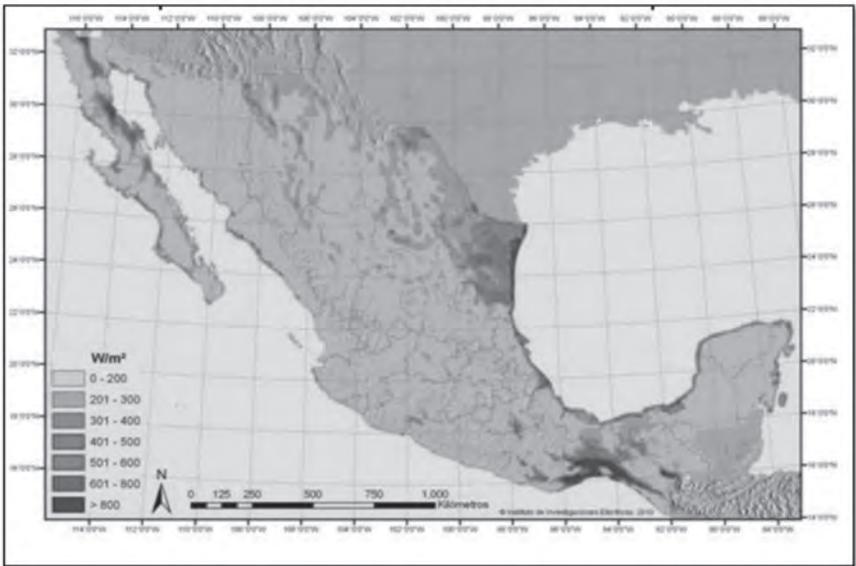


Figure 5. Mexico's wind power density at 80 m.



Thus in order for the border region to reach its potential to develop and exchange renewable energy across the border, electrical transmission infrastructure needs to be built and meeting renewable portfolio standards must accommodate international exchanges. Especially encouraging is the use of interstate compacts to negotiate transborder renewable energy, environmental review, siting, finance and the creation of public-private partnerships to build transmission infrastructure.

Lastly, three mechanisms for improving the energy balance within the transborder region have not fulfilled their potential.

1. **Methane-to-Markets.** In 2004, the USEPA inaugurated a Methane-to-Markets Program, together with seven additional founding nations. Mexico was one of the signatories to the agreement and remains interested in the concept given the value for capturing methane from coal-mine operations, landfills and agricultural operations.
2. **Energy Service Companies (ESCOs).** The mechanism calls for a potential partner to provide an energy demand assessment of factories and other facilities and share the savings and the utilities with them.
3. **Renewable portfolio standards (RPS),** which are target amounts or proportions of a state's electrical demand that it seeks to meet with renewable energy. These exist in all U.S. states along the border, but the transborder mechanism to enable the RPS of a U.S. state to be met with projects in Mexico has not been activated.

Biodiversity

The border region is home to a number of unique biomes known as "natural hotspots" such as the California Floristic Province; the Chihuahuah and Sonoran Deserts; the Madrean Archipelago (a series of mountain ranges and basins rising from the desert floor); southern Texas plains hills and dry forests; and the Western gulf coastal plain. This biological richness and diversity provides resilience and resistance to the border region as well as an immense range and depth of ecological services. These natural hotspots contain great diversity

of species of flora and fauna. For example, the Madrean Archipelago contains 40% of the pine tree species of the world, about 30% of all the oak species known to date, and about 525 species of birds.¹⁵ These transborder ecosystems are also important because they allow migrant species to traverse along a natural corridor that extends beyond the border between the two countries, which is necessary for hunting, mating and exchanging of genetic material for the well-being of their species. Ecosystems and species in the region are threatened by more common forms of pollution and destructive activities, but also by the fragmentation and destruction of the physical environment caused by the border wall.

Water

Since 1906, the United States and Mexico have shared the management of their common water resources. Dividing the waters equitably was the more critical issue up until the 1960s, with the issue of water quality showing an increasing presence in bilateral negotiations and peaking around the 1980s. The International Boundary and Water Commission (IBWC, with U.S and Mexico sections), is the agency responsible for making the water policies of both nations work properly at the border. While there are three binational watersheds (the Tijuana and Colorado rivers and the Río Grande) in the U.S.-Mexico border region, national policies on both sides dictate the water management regimes within them and beyond. Surface water is the only area where a bilateral agreement exists, as groundwater remains a taboo for binational talks; to make things even more challenging, the sharing of subsurface water data has not been reached yet. The reticence by both governments to engage in a discussion on joint groundwater management is most evident in the Imperial-Mexicali valleys, where the All-American Canal incident of 2006 left several scars that neither federal government nor the State of California would care to touch. For U.S. entities, the concern appears to be the wetland habitat that has sprouted down-gradient from the agricultural fields in the Imperial Valley, within Mexican territory, due to the infiltration of irrigation water over decades. For Mexico, the concern is how to rein in private agricultural wells that are not fully regulated.

In any event, groundwater can be euphemistically deemed as an *area of opportunity* for both countries within joint water management.

A spike in salinity in Colorado River water crossing into Mexico was cause for concern during the 1960s. Later on, in the 1970s and 1980s, water pollution in the Tijuana River and the Ambos Nogales area also necessitated bilateral talks. The increasingly urban nature of the U.S.-Mexico border region was probably the major reason why water pollution control and water and sewer infrastructure became the major topics of such bilateral institutions as the U.S.-Mexico environmental program and the Border Environmental Cooperation Commission. According to Sanchez, over 97 percent of U.S. investment in the border programs prior to 1998 was devoted to building up Mexico's capacity to collect and treat its sewage, a clear indication of U.S. priorities prompted by cross-border pollution.¹⁶

Surface water is the only area where a bilateral agreement exists, as groundwater remains a taboo for binational talks; to make things even more challenging, the sharing of subsurface data has not been reached yet.

With urbanization as a predominant trend in this arid region, interbasin transfers of water are increasing. Energy intensity per acre-foot of water is also on the rise, and the water and energy nexus has become increasingly important. According to a study by Baja California's Comisión Estatal de Energía (State Energy Commission), energy costs represent almost 40 percent of total expenditures by all four state water utilities.¹⁷ In that respect, the connections of water and energy, similar to others, such as food and water, are just two of the examples of the intersection of human security with the environment.

Water supply issues will persist as a challenge in that there is competition for surface waters and no agreement about how to use ground waters, even as a first-ever aquifer assessment of groundwater extent and quality is underway.

As far as water quality, the greatest challenge is no longer point sources of pollution, such as a factory, but non-point sources, such as farms or urban runoff. The nexus between water quantity and water quality is water reuse: the treatment of wastewater to acceptable standards and devising ways of reusing the water within the urban context, as well as increasing efficiency in agricultural areas to manage drainage for useful purposes.

The final desirable outcome is to approach watershed-level planning that can incorporate concerns from both sides of the border, integrating water efficiency, source protection, environmental flows for habitat enhancement, and transborder water markets. But this still remains an elusive vision.

Two factors in particular work to make air quality management at the border challenging: a rapid degree of sprawling urbanization and industrialization, and the division of legal jurisdiction between the two countries within those common transborder airsheds.

Air Quality

The border region, with few exceptions, consists of a series of common transborder airsheds (volumes of air that circulate or exist temporarily on both sides of the border). Two factors in particular work to make air quality management at the border

challenging: a rapid degree of sprawling urbanization and industrialization, and the division of legal jurisdiction between the two countries within those common transborder airsheds. Combine the above with the arid and semiarid nature of the region, the high automobile usage in the Southwestern U.S. coupled with the lack of public transit in Mexican cities, and the result is urban air quality that is in fact a mixture of carbon monoxide, suspended particulate matter (mostly PM 2.5, 6.0 and 10), and ozone. In a study on the levels of ozone, carbon monoxide and PM10 done for the San Diego-Tijuana and Mexicali-Imperial borders, Quintero et al found air quality compliance for PM10 only in San Diego, in Tijuana and San Diego for CO, and all four counties/municipalities were in non-attainment for air ozone quality standards.¹⁸

Air quality is especially challenging when we include greenhouse gases. Air quality issues have always been complicated by their complex mixture of pollutants, sources, exposures, effects and the susceptibilities of different populations, and can be compounded in a binational context. What's more, maritime flows introduce pollutants from bunker fuels (the relatively dirty petroleum product burned by ships at sea) and the remote rural and even the larger and closer community centers have no air quality information.

Brick kilns both in the Paso del Norte and the Mexicali-Calexico border are especially dirty sources of all pollutants. Traditional fuels for kilns include waste materials like scrap wood, tires, batteries, fuel oil, and almost anything that's ignitable. The Mexicali-Calexico area has one of the highest incidences of asthma in both countries, and two additional power plants built by Intergen and Sempra Energy aggravated a community already susceptible to respiratory ailments.

Congestion at ports of entry continues to be a source of air contamination as the average queue time has increased in the last 10 years. Some trucks wait in line for several hours.

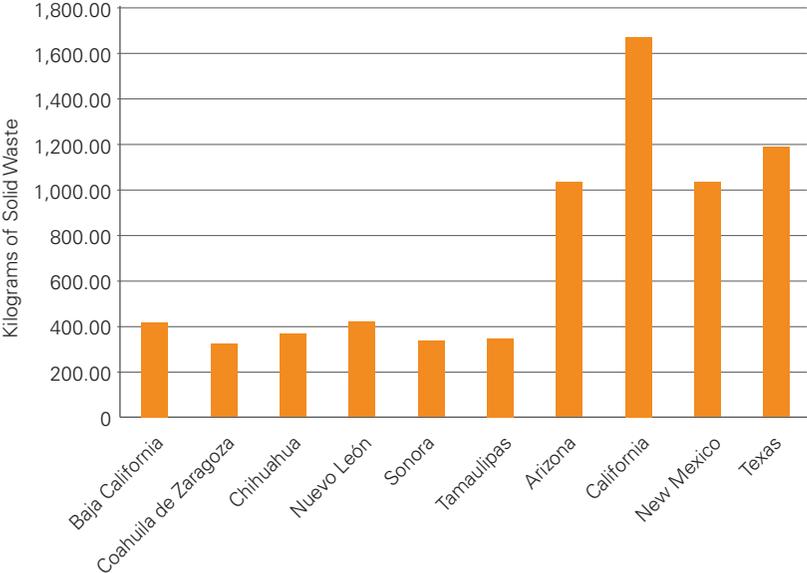
Muñoz-Meléndez, Quintero-Núñez and Pumfrey provide several options to meet the challenges of air quality management at the border, amongst which the cross-border trading of emission-reduction credits and the creation of a clean-air investment fund stand out.¹⁹

Sources of Pollution and Hazardous Materials

Socioeconomic differences and levels of industrialization bear the greatest influence of all in the generation of solid waste. The rich/poor dichotomy that has resided at the U.S.-Mexico border for decades was at the root of many of the hazardous waste findings in Mexican rural areas along the border in the 1980s and 1990s. As described by Sanchez, the "massive exportation of hazardous wastes from industrialized to developing countries" became "the easiest solution for transferring the externalities of their economic development"²⁰ and was of grave concern in the U.S.-Mexico border, particularly in the days when the institutional capacity of Mexico was less developed. Figure 6 and Table 1,

in particular, show the degree of differences across the border in the levels of solid waste production in the US-Mexico Border States per capita in 2008 and total tonnage of solid waste generation from 2004 to 2011.

Figure 6. Solid waste per capita production (2008)



Source: SEMARNAT, *Compendio de Estadísticas Ambientales, 2012* and EEC/BioCycle, *State of Garbage in America Survey (2006, 2008, 2010)*

Hazardous materials include both naturally occurring but human-concentrated elements as well as toxic and otherwise dangerous materials manufactured by humans. “Haztraks” was one of several examples of initiatives to track hazardous materials as they flowed across the border; unfortunately, these initiatives have now ended. Residual and excessive fertilizers and pesticides drift away from farms and occasionally across borders. Therefore, the border program has an agricultural worker training program aimed at alleviating some of the threats from such drift especially to the families of those farmers. Furthermore, half the tires, which were a fire and disease-vector risk, have been removed from the once mountainous piles that existed.

Table 1. Hazardous materials generation at the U.S.-Mexico Border.

State	Hazardous materials generation (tons)		% of state generation within national total generation.
	MX	US	
	2004-2011	2005-2011 *	
Baja California	25,894		1.35
Coahuila	38,624		2.01
Chihuahua	342,650		17.84
Nuevo León	128,849		6.71
Sonora	15,148		0.79
Tamaulipas	146,993		7.65
National Total	1,920,408		100.00
% in Border States:	36.35		
Arizona		305,003	0.20
California		2,590,191	1.67
New Mexico		4,010,276	2.59
Texas		57,641,781	37.26
National Total		154,705,765	100.00
% in Border States:		41.72	

Source: SEMARNAT, *Compendio de estadísticas ambientales 2012*; US EPA, *National Biennial RCRA Hazardous Waste Report*.

* The US has biannual information for this data, therefore we only include information for the years 2005, 2007, 2009 and 2011

One of the provisions of NAFTA was that hazardous materials (hazmat) originating in the U.S. should be repatriated back to the U.S. after use in Mexico since the capacity to store, process and dispose was limited there. The EPA set up a hazmat tracking system after the Southwest Consortium for Environmental Research and Policy reported that only single digit percentages were tracked by those researchers. The funding for the program ended before the enforcement could be implemented. As a result massive amounts of lead batteries are exported across the border to Mexico to avoid U.S. regulations.²¹

The United States EPA database shows that of the 2,153 maquiladoras producing hazardous waste in 1992, only 329 industries have records of shipments to the U.S. This means that only 15% of maquiladoras have actually transported waste to the U.S.²²

Measures of Progress

As we have mentioned throughout this report, there is a lack of hard data that can accurately describe the most important phenomena within the transborder region. The existence of such information would offer a great deal of help to regional decision makers. Over the course of Border 2012, the longest running U.S.-Mexico environmental program, a couple of efforts were made to create a series of indicators to monitor the programs progress. A Border Indicators Task Force was formed to formulate the *State of the Border Region Indicators Report 2005*²³ and a second report in 2010²⁴ which contained a rundown of achievements and progress made on each of the seven goals that were part of the Border 2012 Program.

The Transborder Development Index, which is a product of the Transborder Information System (being built by the Border Research Partnership) is divided into four strategic areas, including sustainability, which is also divided into four dimensions, each one of them with their own subdivisions.

Sustainability Subindex	
Dimension	Indicator
Clean environmental conditions	-Management of wastes and clean-up of dumps -Transportation pollution -Water sanitation -Paving coverage in urban areas
Protection of natural resources	-Water consumption -Preservation of wild areas -Population density in urban areas -Pressure on water resources
Economic development and institutions	-Water industry efficiency -Energy industry efficiency -Environmental consultancy services -Emergency management
Habitability (parks, recreation and diversity)	-Sewer coverage -Water coverage -Per capita parks and recreation area -Infant mortality

Conclusion: Future Challenges to Sustainability

The discussion throughout this piece provides what we believe to be a prudent prescription for addressing the region's sustainability challenges. Below we briefly review some of the most important ones.

1. It is imperative that both nations come to grips with the importance of the region's sustainability as part of their quest to promote our joint competitiveness and security. While the three are considered to be indivisible, the policies set forth by the federal governments do not reflect an equal standing for the three objectives. Moreover, environmental protection continues to be conceived of as a gracious concession or a goodwill action, instead of approaching environmental enhancement as an integral part of promoting regional security and prosperity.

2. In that regard, programs and policies aimed at improving sustainability, particularly those of the state and local governments, need to become more visionary and holistic and less reactive. True to its vision, or that expressed by decision makers while compiling the Strategic Guidelines document in 2009, water conservation must be applied as part of an overall strategy to reduce dependency and energy intensity due to imported water and to provide for environmental flows for ecosystem enhancement. States and municipalities must also strengthen their ability to monitor and enforce environmental compliance.
4. State and federal environmental agencies cannot afford to remain silent about the foreseeable impacts the border wall will have on sensitive ecosystems and endangered species. Security measures currently in place will become very costly unless counterweighed by proactive policies to mitigate environmental impacts.
5. Bilateral water agreements between the U.S. and Mexico are turning a corner. At the closing of this publication, both countries had signed Minute 319, the most recent amendment to the 1944 International Water Treaty which incorporates common water markets, mechanisms for water exchanges and the creation of environmental flows for the Colorado River. The agreement comes as evidence continues to accumulate regarding the future of water supply in North America in the face of increasing global warming and climate variability.
6. The stakeholders within the U.S.-Mexico transborder area have so far failed to act on the region's enormous potential for generating renewable energy. The level of science, economic development and complementary features that the juxtaposition of these two nations provide, together with the wealth of solar incidence in deserts and desert-based cities can make it a world leader in solar and other renewable energy development. The region can ill-afford to pass up this "natural mandate" if it is to seriously seek world class competitiveness and sustainability.

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CONCLUSION

Andrew Selee

Millions of Mexicans and Americans live in the U.S.-Mexico transborder region, but the importance of this region to the economies of both countries goes far beyond its size and population. Not only has the border region become an area of joint economic production for the two countries, but billions of dollars of goods pass through it, connecting the two countries in one of the densest and most vibrant corridors for their economic fortunes. Christopher Wilson has found that approximately six million U.S. jobs depend on trade with Mexico, and these are not only in Texas, New Mexico, Arizona, and California, but also in Michigan, Nebraska, Illinois, Iowa, Indiana, New Hampshire, Tennessee, and almost every state in the union.¹ The economic impact is even greater for Mexico.

The security challenges that the two countries face are also disproportionately concentrated in this region. Over the past decade Mexico has seen a rise in organized crime violence as criminal groups have fought over access to the border region as a way of moving illegal narcotics north, and bringing their profits from sales to U.S. consumers, along with sophisticated weapons and ammunition, back across the border to Mexico. While violence has actually dropped slightly in U.S. border communities over the past decade,² U.S. policymakers have recognized a shared responsibility for the security situation in Mexico and worried about how to protect the shared border against threats from use by terrorist groups in other parts of the world.³

Finally, border communities themselves share unique challenges to manage natural resources since ecosystems that cross international boundaries without

regards to legal jurisdiction require joint problem-solving. Quality of life issues from healthcare to education to culture also often extend beyond the formal boundaries that separate the two countries. How the two countries address these issues – whether managing water, addressing pollution or educating the next generation of border residents – has enormous impacts in both countries far beyond the border region itself.

The greatest of these challenges is how to match the inherent creativity and problem-solving ability of local communities that deal with each other day-in and day-out as part of larger regional systems with the reality of an international border which imposes different legal systems, institutions, and laws, and which requires that much regional decision-making be filtered through Washington, DC and Mexico City.

The border itself is extremely diverse, as Francisco Lara notes, and even the definition of the border region is subject to multiple definitions. For practical purposes, the border is far more than just the communities that lie along the international boundary, but rather the geographic area that is linked through supply chains, transborder tourism, trade, and dense family networks. In many ways, Los Angeles, San Antonio, and Monterrey, for example, are as much part of the border region as many cities and towns that lie on the border itself.

These communities vary greatly in economic development, cultural heritage, and regional histories. On the face of it, there appears to be little similar between San Diego, California and Douglas, Arizona or Tijuana, Baja California and Ciudad Acuña, Coahuila.

Yet the international line that divides Mexico and the United States does impose some common characteristics and, even more importantly, common challenges, on border cities. The greatest of these challenges is how to match the inherent creativity and problem-solving ability of local communities that deal with each other day-in and day-out as part of larger regional systems with the reality of an international border which imposes different legal systems, in-

stitutions, and laws, and which requires that much regional decision-making be filtered through Washington, DC and Mexico City. This report details both the difficulties and the opportunities available to border communities as they deal with this duality, and it proposes a series of ways forward that we believe can improve the future of both countries. In many cases, border residents themselves are leading the way on solving local problems,⁴ but the international nature of the border requires that policymakers in the capitals of both countries support and facilitate these efforts.

One of the most important challenges is how to get the greatest economic benefit for both countries from the border region so that it both improves living standards in the region and serves as a spark for the economies as a whole between the two countries. Erik Lee and Christopher Wilson find that even modest investments in border infrastructure and creative efforts to manage points of entry more efficiently can produce substantial economic gains to both the border region and to the national economies in both countries. Current efforts to develop master plans for infrastructure investment in four sectors along the border, following the successful effort between California and Baja California, are a good starting place, and can lead to synergies between local, state, and federal authorities and between the private and public sectors. Investments in several ports of entry to date have been extremely helpful, although many of these projects are still underway, and there have been a few creative public/private ventures that suggest that there may be new ways of harnessing synergies between economic interests and the public good to improve border infrastructure.

Some of the most exciting possibilities to improve crossing times at the border and stimulate economic exchange may lie in creative approaches to risk management, which

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can also help improve security at the border. The expansion of trusted traveler programs for both cars and trucks has helped to segment flows that are more risky from those that are less so and can be controlled through background reviews and spot checks. Using new technologies, it may now be possible to move towards pre-inspection in some border ports, clearing shipments before they reach the border and tracking them on the way there, so as to decongest ports of entry themselves. While most of the attention in the United States (and, to a lesser extent, in Mexico) has been on investments in staffing between ports of entry, there is good reason to believe that greater attention to the ports themselves makes far more sense both for security concerns (see below) and to spur the economies in both countries.

Security cooperation remains another very tangible challenge for border communities. From the optic of the communities themselves, this challenge is about promoting public security, dealing with violent crime and property crime, and, especially on the Mexican side, professionalizing the police, prosecutors, and courts. From the vantage point of those outside the border, the challenge is about restricting the operations of organized crime groups that use the border to traffic illegal narcotics, guns, and money and engage in human trafficking, as well as other extra-hemispheric groups that might take advantage of these existing smuggling routes to commit terrorist acts.

Both the local public security challenges that communities face and the broader national security concerns about organized crime are interlinked and require new forms of cross-border cooperation. The sharing of intelligence between the national governments in Mexico and the United States on the movements of criminal organizations has led to several high profile arrests and the fragmentation of some groups, and day-to-day cooperation among front-line police officers and prosecutors in border states is also increasing in tandem with national efforts. These interactions sometimes take place through official channels, which have improved over time, and led to the placement of U.S. and Mexican agents in fusion centers in each other's country. Yet they also take place through informal relationships that allow police and prosecutors to share information quickly without going through the often lengthy formal channels of

international notification that run through the capital cities. This is particularly true between municipal and state law enforcement agencies that have developed their own informal protocols and networks for passing sensitive information in a timely way to prevent and solve crimes.

Eric Olson and Erik Lee argue that not only do the two countries need greater collaboration at the border, but they also might think of moving some law enforcement efforts away from the border itself. While border inspections provide a basic deterrent effect for smuggling, there are relatively few seizures at the border of cocaine, heroin, and methamphetamines, which represent the overwhelming profit source of organized crime groups, or illegal money and weapons going south, which provide the lifeblood of the criminal groups.⁵

These valuable commodities are trafficked primarily through ports of entry, where there has been comparatively less investment in staffing, technology, and risk segmentation, while major infrastructure and personnel investments have been made in controlling the expanses between the ports, which are used primarily for immigrant smuggling and marijuana trafficking. However, future efforts to slow the flow of hard drugs, weapons, or bulk cash should not focus exclusively on the border itself. Rather, it is investment in border ports combined with intelligence-based efforts away from the border that allow law enforcement agencies to discover and dismantle the trafficking operations at their origin.

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On the Mexican side of the border, the renewal of criminal justice institutions remains one of the major challenges. There have been some positive developments in Chihuahua, Baja California, and Nuevo León on judicial reform, which

should make the courts more transparent and efficient and lead to changes in policing and prosecution efforts. However, these efforts are still at an early stage. There have also been noticeable investments in reforming police bodies in these states that appear to have yielded results. Crime is down in each of these states as of this writing,⁶ and especially in Baja California and Chihuahua.

Efforts to date to manage water have also been far more institutionalized than other parts of the relationship, and the existence of the North American Development Bank (NADBank) and Border Environmental Cooperation Commission (BECC) provides technical expertise and real funding that can be invested in improving border communities' environmental management.

These institutional changes, while still insufficient, may have something to do with the progress in lowering crime rates. Better cooperation between federal, state, and local authorities, and shared intelligence across the border, have also played a significant role in containing the violence. Cross-border efforts to professionalize the criminal justice system—from police in the streets to prosecutors, judges, and prisons—remains a large area of opportunity for cooperation and mutual learning.

Managing natural resources provides yet another set of challenges for cross-border cooperation. The recent agreements between the two national governments to jointly manage the Big Bend area (2011) and to update binational management of the Colorado River watershed (2012) are landmark efforts to develop collaborative management strategies for shared natural resources. Efforts to date to manage water have also been far more institutionalized than other parts of the relationship, and the existence of the North American Development Bank (NADBank) and Border Environmental Cooperation Commission (BECC) provides technical expertise and real funding

that can be invested in improving border communities' environmental management. However, as Rick Van Schoik and Carlos de la Parra note, there is an urgent need to build on these existing efforts and to promote new ways of managing scarce resources. Some of the challenges, such as water conservation, also require unilateral measures in each country to change practices.

One major opportunity in the border region is the development of renewable energy sources which can benefit communities on both sides of the border. Several Mexican municipalities are well-placed to produce wind and solar energy and perhaps even biofuels, which could both help lower electricity prices in Mexico and help meet new standards in some U.S. states for including renewable sources in electricity generation. To date, however, these efforts have been stymied by the lack of integration of the electrical grid and by regulatory issues that limit cross-border transmission.⁷

Finally, border communities face numerous challenges – and real opportunities – for improving quality of life. These include everything from improving the quality of education to building effective healthcare systems to promoting a vibrant cultural life. Though it lies beyond the scope of this report, it is worth noting that the border region is the site of innumerable experiments in creative ways of bridging the divide between countries to solve problems and improve the quality of life on both sides of the border. Living near an international boundary often creates problems in addressing these day-to-day issues, by making it harder to have consistent responses in communities that lie next to each other across the line, but it also creates opportunities for creative cooperation and cross-fertilization. In two earlier works we have detailed some of the most exciting and innovative efforts at collaboration in these areas that have been taking place, and they remain an inspiration and a lesson in how the two countries can work together more effectively.⁸

Many of the challenges that border communities face are no different than what others in their respective countries deal with: how to improve policing, protect the environment, and generate innovation and growth. The border, however, imposes limitations and creates a need for cooperative thinking on many of these issues. Bringing together stakeholders from the border with

the federal governments of both countries is essential to improving the region's future, and many of the benefits will undoubtedly also accrue to Mexicans and Americans far beyond the border region. A more efficient border holds the promise of helping spur economic growth and create jobs in both countries both in the border region and far beyond. Improved public security, diminished criminal activity, and more secure flows across the border will enhance the well-being of citizens throughout both countries. And a wise management of natural resources will help us preserve the planet for the generations that come. These are challenges that border residents from the United States and Mexico must face together, but also that all citizens in our two countries must-face together.

Endnotes

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