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16. Abstract This research examined the legal, financial, institutional and policy processes that Mexico uses to plan, finance, construct, and implement its transportation network. It documents through twelve case studies the state of the practice in planning, financing, conducting traffic and revenue studies, cost benefit analysis, and environmental assessments and reviews how right-of-way purchase occurs for multimodal transportation infrastructure projects. It was found that Mexico is aggressively targeting infrastructure development as a mechanism to improve countrywide network and modal connectivity and to redress social and economic inequality that had occurred because of the poor transportation network. The 2007 National Infrastructure Plan covers 5 years and multiple modes and will finance approximately 58% of the projects using innovative finance methods and public private partnerships.				
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An Evaluation of Mexican Transportation Planning, Finance, Implementation, and Construction Processes

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Chapter 1. Introduction

The development of Mexico's economy has long been hindered by the inadequate provision of infrastructure. Shortfalls in infrastructure quality have impacted development in many areas of the economy, including international trade. Internal and external observers have long noted that Mexico suffered from systemic and chronic underinvestment in infrastructure and until that pattern was corrected, the country's ambitions for becoming an economic leader within Latin America would likely go unfulfilled. Yet, until recently, the Mexican federal government had little means to correct the deficit as it lacked the basic revenue raising capability. Furthermore, as a highly centralized country, states and local areas were not able to step in and fill the void, even in those states whose GDP per capita and living standards were higher than the country as a whole.

Several significant historical events in Mexico's recent history help to explain the current state of transportation planning and financing in the country. Major economic crises, in 1976, 1981/82, 1986/87, and 1995, all had severe disruptive impacts over the long term planning and execution of infrastructure projects in Mexico. However, as a result of the lessons learned from these crises, the Mexican financial system has been repeatedly reformed and weathered the latest recession without a systemic collapse.

Mexico, like almost every other country in the world, scaled back its investment profile with the emergence of the global economic recessions, yet the country hopes to re-emerge from the short-term scaling back of infrastructure ambitions and resume a course of continuous investment in areas of infrastructure determined to be of strategic importance to the country's future growth. Average annual investment in infrastructure (including transportation and energy) during 2001–2006 was equivalent to 3.2% of the Gross Domestic Product (GDP). This is comparatively low when examined against other middle income countries like Chile (5.8%) and China (7.3%) in the same period. Of that 3.2% of GDP annual average investment, a substantial share goes directly into the oil and gas sector given the continuing monopoly of the federal government on hydrocarbon production. Oil and gas consistently accounted for almost 50% of total infrastructure investment while investment in the transportation and telecomm sectors moved in a range between 24 and 40%. The volatility of investment in transportation infrastructure, when compared with investment in oil demonstrates that maintaining investment in the state oil monopoly is usually the government's top priority, while investment in transportation and telecomm has usually been determined as a residual of the total amount of infrastructure investment net of the oil and gas investments. This prioritization is logical, given the high percentage of federal revenues that comes directly from the sale of oil and gas. The benefits of investment in alternative areas such as transportation, while no less real, are less immediate. Despite this, there has been evidence of improved productivity in the transport sectors over the past few years.

The administration of President Felipe Calderón made clear its intentions to privilege (or fast-track) the construction and completion of infrastructure projects with a long-term strategic plan. In the summer of 2007 it released the National Infrastructure Plan (*Programa Nacional de Infraestructura*, NIP). The NIP covers four major sector areas: transportation, communications, energy, and water. There are several drivers behind this initiative. One is, as mentioned before,

the previous inability to maintain a sustained rate of investment in the sector. The other main driver is to improve Mexico's competitiveness indicators and increase the competitiveness of the Mexican economy against economies worldwide. One of the goals related to this, for example, is for Mexico to be ranked in the top 20 percent of the World Economic Forum infrastructure competitiveness index by 2030 – Mexico is currently ranked 64 out of 125 countries surveyed. An associated goal is to be ranked first among the countries in Latin America by 2012 (Mexico is currently ranked 7th).

The NIP is a 172-page blueprint for infrastructure development through 2030 that is designed to increase the competitiveness, quality, and coverage of Mexico's infrastructure. This five-year program will rely on public-private partnerships (PPPs) to supplement direct state funding in order to develop over 300 transportation infrastructure projects around Mexico. The NIP constitutes an overall investment of US\$196 billion between 2007 and 2012.

In general, each mode of transportation within Mexico was developed independently. There has not been significant attention to network interconnections either between or within modes. This led to higher logistic costs and inventory levels, which impacted competitiveness and productivity. Another consequence of the incomplete road network was wide variations in road quality and maintenance and the evolution of a varied price structure which meant that some free roads were so poorly maintained that they became essentially unusable at the same time that other roads, while high quality, were too expensive to be used by all but a small minority (Pokorny, 2001). Several recent presidential administrations within Mexico have sought to improve the transportation network, yet financial constraints have not allowed Mexico to reach the level of investment that allows it to compete with other countries.

The NIP aims to address the lack of modal integration by prioritizing highway connectivity and targeting strategic investments in other modes and focuses on several key infrastructure areas including:

- Modernization and construction of roadways,
- Expansion of the railway system—including suburban passenger rail projects,
- Continued development of Pacific and Gulf Coast ports, and
- Expansion of existing airports.

About half the investment associated with the NIP was projected to come from the private-sector; however, recent liquidity problems for private-sector lenders have put that goal in jeopardy. Therefore, it may fall to the federal government to play a more direct role in direct financing than was originally intended. In February 2009, the Director of National Infrastructure and Public Works Bank (*Banco Nacional de Obras and Servicios Públicos*, BANOBRAS) was quoted saying that several development projects are not ready to begin because of lack of financing and obstacles in the bidding process (Ayala, 2009). However, none of the projects that are included in this report have been abandoned by the lack of financial liquidity and were still underway at the time of the report's submission.

Mexico's increased attention to its transportation infrastructure is expected to have an impact on trade and transportation flows with the state of Texas. In the past two decades Mexico and Texas have been able to establish a thriving and rapidly expanded trading relationship *despite* the presence of serious deficiencies in the Mexican transportation system which made trade with many regions of the country challenging. Greater internal cohesion within the

Mexican transportation network is expected to greatly expand the types of trading relationships that can be effectively developed. Mexico is Texas' largest trading partner, and consequently they share an interest in increasing trade volumes across their 1,254 mile border. This region has been an important economic driver for Texas, Mexico, and the U.S. The four Mexican states that border Texas (Chihuahua, Coahuila, Nuevo León, and Tamaulipas) represent 24% of manufacturing output in Mexico; 48% of output of metal products, machinery and equipment; are home to 55% of Maquiladora employment; and receive 75% of the foreign direct investment in the country (State of Nuevo León, 2007). As a consequence of this and the important trading relationship between Texas and Mexico, the Texas Department of Transportation (TxDOT) sponsored a two-year research project with the Center for Transportation Research (CTR) in August 2007 to understand how Mexico is planning, financing, and developing its infrastructure system and how changes to the planning process or the infrastructure base may impact Texas in the future.

University of Texas researchers spent one year examining the legal, institutional, and economic underpinnings of transportation planning within Mexico, as well as the NIP. After completing this review, twelve major case studies were performed in year two of the study. The case studies were intended to demonstrate how these institutional factors functioned in real world examples. They were designed to focus on infrastructure projects considered strategically valuable by the Mexican government and assess how various institutions contributed to these projects' development. CTR utilized an innovative option unique to The University of Texas – the LBJ School of Public Affairs, Policy Research Project (PRP) – to accomplish development of the case studies.¹

The PRP is a year-long applied research study in which a group of 15-20 graduate students, selected due to their interest and expertise in key project areas, performs real world analysis on a particular topic for a public sector sponsor. The PRP is regularly utilized by the Congressional Research Service and other government sponsors.

The scope of the case studies was intentionally broad, focusing on issues such as project prioritization and selection, budgeting and finance, bidding and tendering, right-of-way (ROW) acquisition, environmental assessment and mitigation, engineering/planning coordination among entities, and citizen involvement. This approach allowed the researchers to develop a complete picture of the planning and implementation process as it applied to different types of projects.

In addition to research on the implementation and development of Mexico's infrastructure programs, the project has also explored the degree to which Texas and Mexico are coordinating their transportation plans. Through a series of technical memorandums, the project analyzed the process of project development in Mexico, reviewed cross-border coordination activities, created a database of contacts of Mexican entities and individuals involved in transportation infrastructure development, and assessed the differences and discontinuities between Mexico and Texas transportation plans.

The report is structured as follows. Chapter Two provides a primer on the political, legal, and financial and policy underpinnings of Mexico's transportation infrastructure development.

¹ Dr Leigh Boske, who has performed over 30 PRP reports principally dealing with international transport policy issues, logistics, trade, and multimodal trade in the U.S., Europe, and Latin America directed the PRP along with, Lisa Loftus-Otway and Nathan Hutson.

The chapter summarizes the legal structures that organize and coordinate this process, including the finance process for transportation infrastructure, and outlines the 2007–2011 NIP. A more in-depth review of this area is provided in Appendix A. Chapter Three reviews the state of the practice vis-à-vis transportation planning and implementation processes for highway infrastructure development. It was developed from a series of interviews with SCT and the private sector in Mexico City during 2008 and 2009. Chapter Four is devoted to twelve case studies undertaken by the PRP in the second year of the research and summarizes the critical elements found in these case studies. The case studies cover multiple modes, geographic areas, and funding sources with a view to providing the reader with an insight into the various mechanisms and processes that are currently taking place in Mexico.² Chapter Five outlines the differences (and discontinuities) that the research discerned between the U.S., Texas, and Mexico’s transportation infrastructure plans, programs, and financing. Chapter Six reviews current cross-border planning initiatives, and makes recommendations for future cross-border planning and its importance for the U.S. and Texas. Chapter Seven provides conclusions from the 2 years of research.

² For the reader who wishes to review the full technical memoranda that were developed for this task, this is provided on the CD-Rom that accompanies this report and the CD-Rom is also available on request from the authors.

Chapter 2. Statutory Processes for Transportation Development

The development of Mexico's statutory processes for its transport sector has reflected the political and economic evolution that is taking place at the macro level. The system of transport planning as it exists today as opposed to the system that existed through the 1980s, is characterized by greater private-sector participation and the beginnings of devolution to state and local governments. Mexico remains a highly centralized country, yet the development of public private partnerships (PPP) along with a more active role played by some states has made transportation infrastructure development in Mexico more responsive to regional needs and differences. The increased role of private-sector actors in financing and constructing new transport infrastructure across modes is leading to a substantial change in the role of the Ministry of Communications and Transportation (*Secretaría de Comunicaciones y Transportes, SCT*). While SCT was previously responsible for all areas of planning and construction, it is increasingly sharing this responsibility with other parties. This chapter was developed from a technical memorandum that was drafted in year one of the research study.³

2.1 Background

As a civil law country, Mexico has a legal tradition that is structurally distinct from the U.S. This foundational difference has colored many aspects of Mexico's economic and political development and must be noted in interpreting present day activities within Mexico. Like the U.S., Mexico's government is separated into three branches: Executive, Legislative, and Judicial. While the legislature is officially charged with initiating legislation, in practice this power is delegated almost exclusively to the President.

One clear characteristic of the civil law tradition within Mexico is the frequency with which changes in policy require corresponding changes to the Constitution. Mexico's 1917 Constitution (*Constitución Política de los Estados Unidos Mexicanos*) has been amended over 400 times. Up until the economic crisis of 1982, Mexico infrastructure development was planned, financed, and constructed in a centralized manner. The 1982 economic crisis, including monetary devaluations, inflation, unemployment rate increases, external debt crisis, and expropriation of the banking sector forced the government to loosen its control over the economy and open up the country to greater foreign investment. Since 1982, every Mexican president has enacted reforms to integrate the Mexican economy with the global economy. For example, under the *de la Madrid* and *Salinas* administrations, most state-owned enterprises were sold and national and foreign investment in infrastructure was encouraged. Railways, ports, and airports were privatized and PPPs were used to develop new infrastructure components including toll roads.

³ For those readers wishing to view this longer document it has been placed as Appendix A to this report, and can also be found on the accompanying CD-Rom to this report.

2.2 Legal Authority for Transportation Development

2.2.1 Strategic and Priority Activities

While the 1917 Constitution forbids monopolies, it affirms in its first paragraph that the state has exclusive powers to develop and direct activities deemed as “strategic” sectors to the exclusion of other participants. Strategic and Priority sectors of the economy are exempted from the anti-monopoly provision and are not legally considered monopolies. Article 28 in the Constitution deals with the classification of strategic and priority activities.

Strategic activities must be carried out solely by the federal government (Article 25 of the Constitution). These areas currently include postal, petrochemicals, radioactive minerals, and nuclear and electrical power generation and transmission. This distinction has been critical to the development of these areas of the Mexican economy as well as other industries which are not considered strategic but whose operations are dependent on one or more of the strategic sectors. In reality, state control has not been absolute. For example, there are exceptions for small scale electricity generation in rural areas. Thus, while the designation ‘strategic’ implies an absolute exclusion of private investment in these activities, certain accommodations have been made (Pereznieto, *et al.*, 2004).

Priority activities are categories of economic activity where the government may choose to develop projects with the private-sector. The Mexican Congress amended Article 28 to reduce the number of strategic areas and open up more areas as priority activities. The most relevant amendments for the transportation sector occurred in 1993 and 1995 when independent port authorities were created to manage the countries ports and railroad development and management was re-classified as a priority activity, making private rail concessions viable.

Under the Constitution, certain areas are assigned exclusively to the federal government and others exclusively to the states. In a number of important areas, the states and federal government share jurisdiction, transportation planning falls in this area (Pereznieto, *et al.*, 2004). Transportation may be regulated in a state by federal and state laws (Centro de Estudios Sociales y de Opinión Pública, 2006). Table 2.1 shows how the division of powers breaks down.

Table 2.1: Governmental Division of Powers in Mexico

Public Service	Management and Current Expenditures	Investment and Capital Expenditures
<u>Urban Planning</u>		
Land Use Control	M	
Tenure regulation	M	
<u>Transport</u>		
Urban Transport	F, S, FD	F, S, FD
Urban Roads	M	M
Highways	F, S	F, S
Turnpike Motorways	F, S	F, S
Railways	F	F

Key: F = Federal; S = State; M = Municipal; FD is the Federal District
Source: OECD, 1999.

Highway Network

The Law of Roads (*Ley de Caminos, Puentes y Autotransporte Federal*), enacted in 1993 just before the North American Free Trade Agreement (NAFTA) was implemented, regulates the development of highway infrastructure. The law sets guidelines for the use of concessions and defines the different roadway types as recognized by the federal government. As summarized in Table 2.2, Mexico's road network is classified into three areas:

Table 2.2: Mexico's Roadway Types

Federal highways	State roads	Rural roads and improved openings (<i>brechas mejoradas</i>)
Maintained and developed by the federal government. These routes are primarily used to travel between major cities and facilitate international trade and economic development.	Used to facilitate regional trade by linking rural businesses and thus contributing to regional integration.	Constitutes modest roads, generally unpaved. Their value is more social than trade oriented since they connect small rural communities that would otherwise be completely isolated.

The institutional responsibility for the administration of tolled facilities rests with the SCT. A separate body, Federal Roads and Bridges (*Caminos y Puentes Federales, CAPUFE*), manages some of the tolled roads and bridges. Concessions to private sector operators or to states make up the remainder of the network (Giugale, et al., 2001).

Railroads

The Mexican government owned the rail network from 1937 until 1997 when it privatized the first of four railway packages through 50 year concessions. In February 1995 Article 28 of the Mexican Constitution was amended to reclassify railroad activity from a strategic to a priority area of the economy to permit private investment. Under the new law, foreign investment in railroads was restricted to forty-nine percent ownership. Currently Mexico has eight railroad concessionaires.⁴

Ports

Mexican port privatization started in 1993 with a new Ports Law which dismantled the public port agency *Puertos Mexicanos* and created independent Port Administrations (*Administraciones Portuarias Integrales, APIs*) at each port or group of small ports (Pargal, 2001). APIs are autonomous, self-financing, publicly owned companies that act as landlords. The goal of the reform was to increase competition between ports and the operators within the ports. APIs have title to the concessions for the use and management of ports and can grant

⁴ Mexican Railroad Transportation (*Transportacion Ferroviaria Mexicana, TFM*), Mexican Railroad (*Ferrocarril Mexicano, FERROMEX*), Southeast Railroad (*Ferrocarril del Sureste, FERROSUR*), Mexican Valley Railroad Terminal (*Terminal Ferroviaria del Valle de México, FERROVALLE*), Coahuila Durango Short Line (*Linea Corta Coahuila-Durango*), Chiapas-Mayab Railroad Company (*Compañía de de Ferrocarriles Chiapas-Mayab*), Tijuana-Tecate Short Line (*Linea Corta Tijuana-Tecate*), and Tehuantepec Isthmus Railroad (*Ferrocarril del Istmo de Tehuantepec*).

concessions to private sector terminal operators. Up to 100% foreign investment is permitted in this sector. Since enactment, all of the country's twenty-two principal ports were opened to private investment. Under the privatization plan, the government also allowed 20 year private concessions for construction and operation of new terminals (Nolan, 1999). Modernizing the port system has led to the substantial reductions of federal subsidization for port operations (Pargal, 2001).

Airports

Mexico's experience with the privatization of the railroad system paved the way for the airport privatization (Serina, 1999). Most of Mexico's civil airports are operated by *Aeropuertos y Servicios Auxiliares* (ASA), a public corporation created in 1965. Public investment in airports lagged behind the growth in airport activity due to a lack of funding (Pargal, 2001). In 1995 a new Airports Law (*Ley de Aeropuertos*) authorizing private participation was enacted. Guidelines for private investment were developed in 1998. Corporate entities were created to manage the airports in which the government retains majority interest. Each of these were granted a 50-year concession to operate a specific airport. Concessions are grouped under a controlling entity, which owns the shares of capital stock of the concessionaires.

2.2.2 Environmental Regulation of Transportation Projects

It has only been in the relatively recent past that legislative language relating to environmental regulation and environmental impact assessment has been codified within Mexican law. The 1983–1988 National Development Plan acknowledged, for the first time, that “...*environmental issues were directly related to the social and economic development of the country,*” (Centro de Estudios Sociales y de Opinión Pública, 2006). The General Law of Ecological Equilibrium and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*, LGEEPA) is the regulatory body for ecology and the environment in Mexico. LGEEPA's principal function is to protect and preserve the environment in Mexico. Federal agencies that have influence over environmental policy and regulation in Mexico, include: the Secretariat for the Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*, SEMARNAT) and the Secretariat of Social Development (*Secretaría de Desarrollo Social*, SEDESOL).

Each state within Mexico is permitted to enact its own environmental laws, provided that their standards are not lower than federally established standards. While SEMARNAT has offices in every state, the uneven distribution of governmental resources between the federal and state level has meant that many states lack the infrastructure and expertise required to undertake effective environmental monitoring and develop environmental regulation (Pereznieta, et al, 2004). LGEEPA's Article 28 requires environmental impact statements (*Manifiestaciones de Impacto Ambiental*, MIA) for both public and private projects before operations are permitted. SEMARNAT is responsible for ensuring that an MIA is undertaken before any airport, highway, port or railway project starts. SEMARNAT is also responsible for reviewing the MIA.

2.2.3 Foreign Investment

As mentioned in the introduction, there are currently several constitutional restrictions that bar or curtail the degree of private participation, by both Mexican and international firms, in key industries. Beyond these restrictions on all private investment, there are several other restrictions on investment by foreign firms. In the first part of the 20th century, foreign capital played a major role in the development of Mexican infrastructure, but since the 1917 revolution Mexico has placed strict regulations governing foreign investment which significantly impacted the development of infrastructure. The regulations prohibited majority ownership by foreign entities in many economic activities and designated many sectors entirely off limits to foreign investment.

On December 27, 1993, President Salinas enacted the Foreign Investment Law (*Ley de Inversión Extranjera*), initiating a significant move towards a more liberal foreign investment regime in light of Mexico's future obligations under NAFTA. The law provides that any foreign investor may purchase shares in a Mexican enterprise, acquire the assets of a Mexican company, establish a new business in Mexico, or expand its current business, subject to certain restrictions (Villarreal, 2005). This opened new areas of investment to foreigners and allowed many international groups to enter into the Mexican PPP market (Villarreal, 2005).

2.2.4 Role of International Treaties and Cooperation Arrangements

Mexico applies international treaties hierarchically under the Constitution and above federal regulation (Mexican Supreme Court, 1999). Treaties need to be signed by the Executive Branch, but also ratified by Congress to come into effect in Mexico.

The most important treaty for the purposes of transportation and this study is NAFTA which came into force in 1994. The most significant transportation provisions are contained in Chapter Nine of NAFTA which loosened restrictions on trucking. Under this chapter trucks from all NAFTA countries were to be allowed to operate anywhere within the treaty zone and Canadian and U.S. railroads were able to market their services in Mexico.

However, while rail integration has developed quite successfully, Mexican trucks are still not allowed to operate beyond the border crossing areas in the U.S., nor are U.S. trucks permitted to make deliveries to the interior of Mexico. Despite a pilot program to test the safety implications of opening the border to cross-border trucking, full scale implementation remains on hold. U.S. railroads are able to operate unit trains with their own locomotives, construct and own terminals, and finance rail infrastructure and Mexico enjoys full access to the Canadian and United States railroad system unlike the limited access for trucks

2.3 Planning of Transportation Infrastructure

The concept of national planning has always been a popular political concept, but in practice, was not consistently applied until 1983. In 1983, a new Planning Law (*Ley de Planeación*) was enacted which created a structure called the National Democratic Planning System, with four components: creation, execution, control, and evaluation (Ordaz, et al, 2006). Each National Development Plan (*Plan Nacional de Desarrollo*, NDPs) is required to cover a six year period corresponding to the presidential administration. Notwithstanding this cap, they can include certain long-term project and policies. NDPs are drafted during the first year of office

and usually consist of a five-year plan issued in the second year of office (Pereznieto, et al., 2004). NDPs are binding for all state entities and require coordinated implementation between the federal government, states, and municipalities, as well as, involvement of non-profit entities.

All the states and municipalities are also required to create their own development plans in accordance with the NDP. In 2000, the percentage of municipalities judged to have well-established development plans was 81% for urban areas and 74% in rural areas (INDESOL-INEGI, 2000). State governments and municipalities take part in the NDP's design by means of coordination agreements executed between them and the federal government which outline how these are to be created (Cento de Estudios Sociales y de Opinión Pública, 2006). Article 32 of the Planning Law also requires the sectoral plans (*Plan Sectorial*), as well as programs, to be submitted to the states for approval in accordance with the coordination agreements. Figure 2.1 shows how these plans intersect.

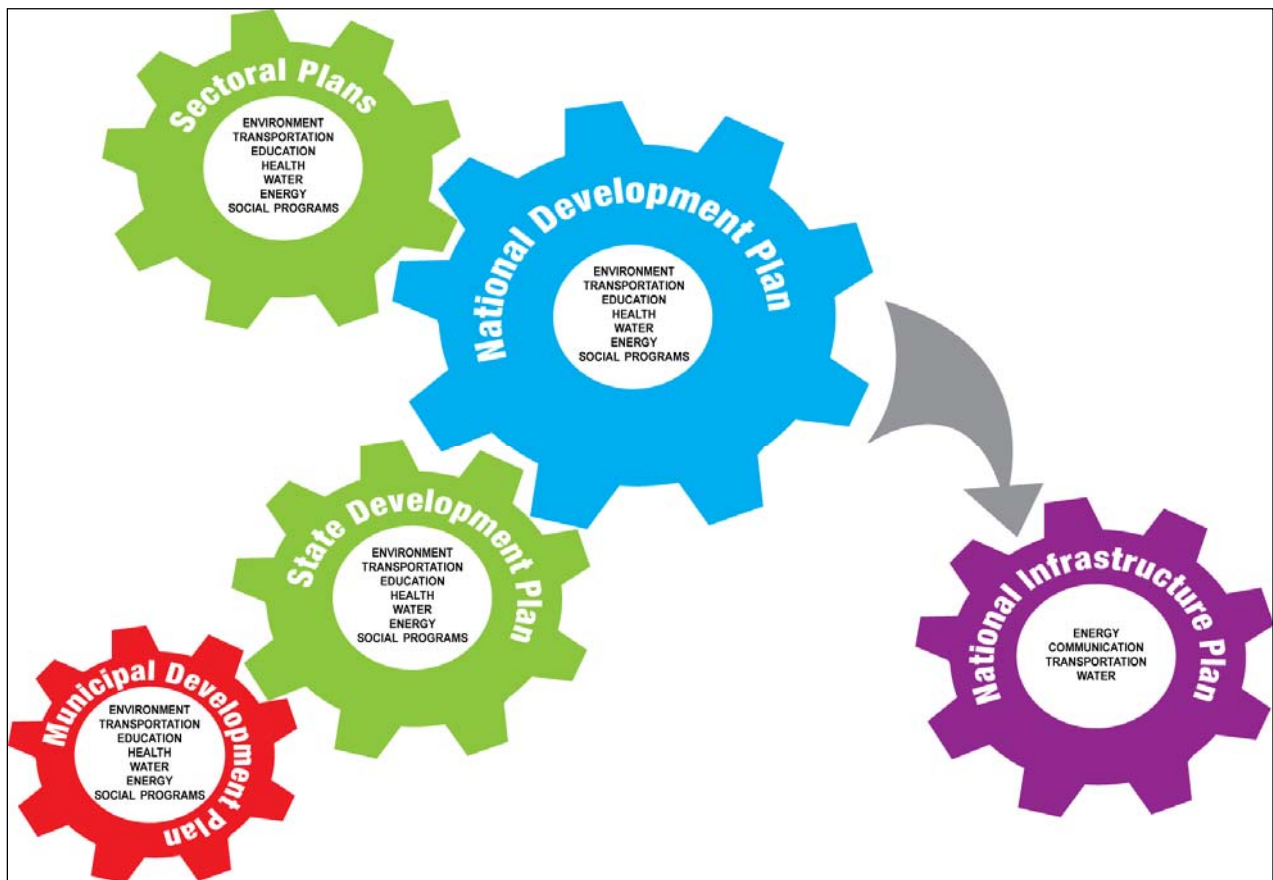


Figure 2.1: How Development Plans Intersect

2.3.2 Agencies Involved in National and International Transportation Planning

Planning is conducted by the following federal agencies:

- SCT - responsible for the formulation and implementation of policies, plans, and programs for communications and transportation development at the national level,
- Secretariat for Foreign Relations (*Secretaría de Relaciones Exteriores, SRE*) - participation in the planning, construction, and operation of international bridges and border crossings, and
- Secretariat of Social Development (*Secretaría de Desarrollo Social, SEDESOL*) - responsible for transportation planning, specifically focusing on areas of inferior living conditions.

SCT was created in its current form in 1959 when the Secretariat for Communications and Public Works was dissolved to give rise to two new secretariats: SCT and the Secretariat of Public Works. Over the next 20 years SCT was granted additional authority related to merchant marine and port infrastructure, railway track construction, and sectoral coordination among all public agencies and quasi-governmental companies involved in communication and transportation matters. In 1982, SCT was assigned authority to build, maintain, and reconstruct transportation and communications infrastructure and became responsible for all planning and execution of functions involving transportation issues. SCT has undergone multiple internal administrative restructuring programs, and between 1983 and 1988 SCT's role has evolved to include oversight of the growing participation of the private-sector in building and operating transportation infrastructure and overseeing the increasing trend to decentralize to the state governments. SCT has thirty-one state centers that conduct operational functions. State transportation planning activities are carried out in coordination with the corresponding federal entities and are coordinated by the General Directorate of Planning at SCT's head office. Its primary functions are to coordinate SCT's actions at federal (with other agencies), state, and municipal levels, as well as with the private and social sectors, and carry out the Sectoral Program (*Programa Sectorial*) goals.

SRE encourages participation in the planning, construction, and operation of international bridges and crossings. In the case of roads and highways, these functions have been taking place since 1983 through the Mexico-U.S. Binational Group for Bridges and International Crossings. The group includes nine secretariats, and coordinates federal, state, and municipal entities that are involved in the negotiation, construction, operation, and maintenance of ports of entry on the Mexican borders (SRE, 2007). This group is also responsible for examining and analyzing the viability of new ports of entry.

2.3.3 Mexico's National Infrastructure Program 2007–2012

As mentioned in the planning section earlier, the Mexican government is required to develop a NDP (which can include long-term planning processes). Felipe Calderón's administration in 2006 presented its long-term strategic vision document named "Mexico 2030." The document stressed the need for improved infrastructure is critical for long-term economic growth objectives. The NDP consisted in formalizing the vision presented in "Mexico 2030." The NIP, presented in July 2007, includes over 300 strategic projects in transportation (highways, ports, airports, rail, and multimodal) as well as in telecommunications, energy

production and distribution, and water and irrigation projects. In the following months, as established by the NDP, the administration issued specific sectoral plans. SCT's sectoral plan, released in November 2007, includes the bulk of projects in the NIP with the exception of the energy and water sectors. The sectoral plan includes a series of indicators for evaluation of the objectives of the NDP and NIP over the 5 years of its lifespan.

Concurrent with the NIP, SCT issued the “highway program 2007–2012.” The program included 100 strategic projects that will be developed during that NIP timetable.

The NIP objectives are to: improve coverage, quality, and competitiveness of infrastructure; make Mexico into an international logistic platform; increase access to public services—particularly in areas of greatest need; promote balanced regional development with special emphasis in the south and southeastern regions; encourage sustainable development and employment and build tourism oriented infrastructure.

The NIP established some strategies and objectives for the successful implementation of the substantially increased amount of public and private resources projected to be put into these infrastructure projects. These include:

- encourage the authorization of multi-year investment projects;
- improve planning, preparation, administration, and execution of projects with best practices and standards;
- solve problems related to the acquisition of rights of way and simplify environmental authorization formalities;
- actively promote PPP's and strengthen their legal frameworks; and
- eliminate unnecessary regulations and inhibitors to investment and improve coordination among the three levels of government.

The NIP-proposed project investments are based on three scenarios dependent on the success of tax and other economic reforms. The scenarios are:

- Inertia (if no tax or other reform proposals are approved),
- Base (only tax reforms approved – used as default scenario), and
- Outstanding (tax and other structural reforms approved).

Table 2.3 compares the scenarios and shows their range of indicators:

Table 2.3: Comparison of Scenarios and Range of Indicators in the NIP

	Annual Investment (% GDP)	Total Investment 2007-12 (Billions US\$)	Tax Initiative(s)
Inertia	2.0 - 3.0	150	Tax Reform fails
Base	3.0 - 4.5	226	Half of Tax reform proceeds
Outstanding	4.5 - 6.0	301	Significant increase in public and private investment

In December 2007 the Mexican Congress approved, with some modifications, President Calderón's proposed tax reform. The reform's main features are the creation of an alternative minimum tax and closing of loopholes that will allow the government to increase tax revenues up 2% of GDP. While the approval of the tax reform alone would elevate the revenue raising ability from the inertial to the base scenario, the economic slowdown that occurred during 2008 has led to a situation that is closer to the inertia scenario. On the other hand, the estimate of infrastructure need was based on pre-recession estimates of growth, therefore while revenue has been reduced, it is possible that projects thought to have been urgently needed prior to the recession are now viewed differently.

Trade-dependent projects, such as the proposed port of Punta Colonet, fall into such a category. Despite being prominently featured in the NDP, the project has not been placed out to bid. Other projects that have been impacted by lower revenues plus lower demand forecasts include the second and third line of the commuter rail in Mexico City. The latter has had to be reworked because of lower than estimated private-sector proposals. The Calderón administration was moving to implement structural reforms related to the energy sector and labor markets that it argued would help in the path towards the most optimistic revenue scenario. However, the combination of falling energy prices and the loss of the PAN's majority have lowered ambitions for implementing the President's reforms.

The 2008 Budget approved by Congress included slightly less than US\$4 billion for highways and roads. This amount falls just slightly below what is needed to achieve the base scenario projection. Table 2.4 compares accumulated investment across transportation sector modes (in US\$ Billions) under the three scenarios:

Table 2.4: National Infrastructure Plan Modal Investment Scenarios

Mode	Inertia	Base	Outstanding
Highways	\$14 billion	\$26 billion	\$37 billion
Railways	\$3 billion	\$4 billion	\$8 billion
Ports	\$4 billion	\$6 billion	\$10 billion
Airports	\$2 billion	\$5 billion	\$7 billion
Total	\$23 billion (15.3%)	\$41 billion (18.1%)	\$62 billion (20.6%)

2.4 Budget Processes for Transportation Development

The infrastructure development process (planning, selection, approval, and implementation) is tied to the budgetary rules and structure of the federal, state, and local governments. Oftentimes lack of coordination for development of potential bi-national projects is derived from misalignments and lack of proper understanding of the respective planning and budgetary processes in both countries. The objective of this section is to present an overview of Mexico's Federal Budget process, its interaction with state and local governments, as well as the way infrastructure projects are financed.

The first section reviews the nature of Mexico's public finance structure and describes the process of budget submission and approval. In the second section, the legal framework and mechanisms of revenue and budget sharing between the federal and state governments are outlined. Finally, this section also discusses the financing of infrastructure projects and the creation of dedicated investment funds that underpin this process.

2.4.1 Public Finances and Budget Creation

In Mexico, a high proportion of tax revenues are levied by and directed to the federal government. Mexico's federal taxes include income, value added, and excise taxes, as well as import duties and other fees. States and local governments (*municipios*) have little revenue raising power and it is usually limited to a state payroll tax (which cannot exceed 2 percent), property tax, and fees for services (including driver's licenses and some vehicle registration fees). Through different mechanisms established by law, namely the 'Fiscal Coordination Law,' that will be described in the next section, the federal government gives back to states and municipalities a share of the total revenues raised.

The Constitution and federal laws, and regulations, regulate the federal budget process. Articles 74, 75, 126, 127, and 134 of the Constitution provide the framework for the process of creation, submission, revision, and approval of the budget. The Federal Budget and Fiscal Responsibility Law (*Ley Federal de Presupuesto y Responsabilidad Hacendaria*, FBFRL) issues specific directives for the application of the federal budget once Congress has approved it, including directives related to transparency and certain tender provisions. The Fiscal Coordination Law (*Ley de Coordinación Fiscal*, FCL) sets out the framework for sharing revenues and budgetary appropriations between the federal government and the states.

Mexico's budgetary process is in appearance not that much different from the U.S. There are differences in details however, due to the different legal systems and intrinsic political and historical traditions. One of the key differences between the countries is the timeline of submission and execution of the budget. Unlike the U.S., in Mexico the fiscal year coincides with the calendar year. This difference should be kept in mind for coordination purposes.

Mexico's Federal Budget has two components: Revenues Law and the Federation's Expenditure Budget (*Presupuesto de Egresos de la Federación*, PEF). Article 74 of the Constitution describes the timeline and process of approval. These two components are submitted and approved by separate votes but both are part of the overall budget. Figure 2.2 shows this process.

While there are specific laws and regulations regarding each of the federal taxes mentioned earlier in this section (Valued Added Tax Law, Income Tax Law, Products and Services Special Tax Law (excise), etc.), the Revenues Law (*Ley de Ingresos de la Federación*) is the Congressional authorization Act that allows the Executive to be able to levy those taxes each year. This Revenues Law includes any special or temporary provisions (like temporary credits for example) that would be applied in a determined year.

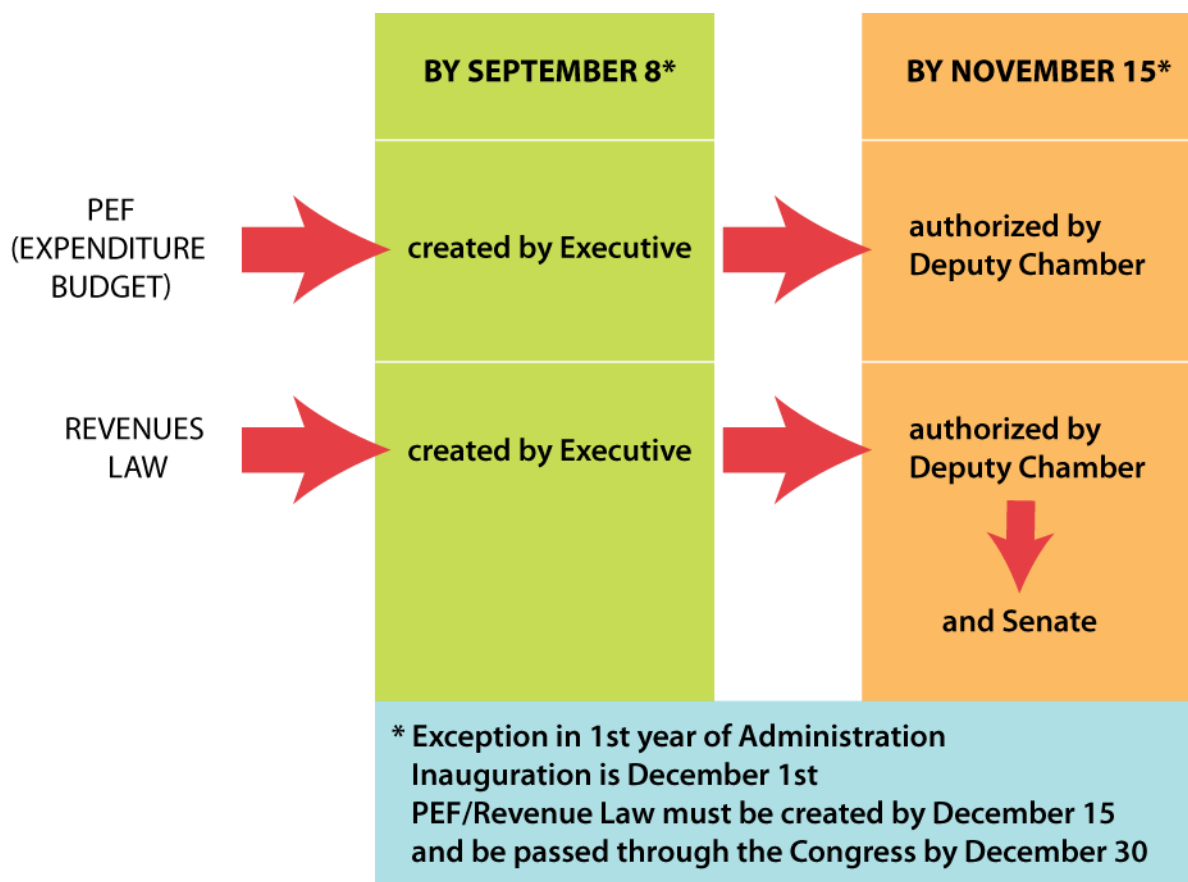


Figure 2.2: Mexico's Budget Development Timeline and Approval Process

Mexico's federal government revenues' are highly dependent on oil production and exploration. A combination of excise, corporate, and special taxes levied on the state owned oil company Petróleos Mexicanos (PEMEX), the federal government produces almost 40% of its total general revenues. For example, oil revenues accounted for roughly 36% of the total general revenues in 2007 (Harrup, 2009). It is worth noting that the great majority of oil revenues go to the general revenues fund helping to finance the overall budget and are not dedicated to any specific sector.

Oil extraction rates have fallen in recent years. This is partially because the Constitution of Mexico reserves the right to exploit oil resources to the state (Harrup, 2009), and has led to no direct foreign investment in exploration and extraction in Mexico. PEMEX's ability to find and develop new sources of oil has been hindered because such a significant portion of the company's profits are given directly to the federal government instead of being reinvested in exploration activities. If PEMEX profits exceed expectation in a given year, then the government takes the additional money as revenue, but if PEMEX profits decline, it often leads to a budget cut for the company in order to make up for shortfalls elsewhere in the federal budget. This has led to severe underinvestment in exploration and development of new fields that is compounded by the inability to partner with foreign firms in the oil industry. Because of this lack of

investment PEMEX lacks the technology necessary to develop many of its deepwater fields, and since foreign investment in the oil sector is constitutionally forbidden, the country cannot partner with a big oil firm to gain such technology. As a result oil outputs are falling with little hope for expanding production (Blank, 2008).

There have been several attempts to decrease the federal government's dependence on oil revenues. Currently, there are discussions underway regarding a constitutional energy reform that would allow for external or private sector investment in Mexico's energy sector. This is a politically difficult subject in Mexico, as PEMEX and the nation's oil are seen as a birthright to be shared among all Mexican citizens. There is therefore keen political opposition to foreign investment in the sector (Blank, 2008). Political considerations aside, the proposed reforms still fall short of what is likely needed to maintain Mexico's oil output and support the federal budget because they do not allow foreign investment equity shares in exploration and extraction projects. The proposed reforms only allow PEMEX to compensate foreign oil firms for their services in cash, a much less attractive deal for potential foreign investors (Harrup et al., Anthony. 2009).

If Mexico is able to implement reforms for PEMEX, they will need additional fiscal reforms to support the federal budget, which are likely to include unpopular tax hikes. Tax revenues as a percentage of GDP are only about 12% in Mexico, much lower than the OECD average of 36% and lower even than the Latin American average of 17% (Hausmann, Ricardo, 2009). Mexico approved a fiscal reform bill in 2007 that is expected to increase tax revenues by 2% before the end of President Calderón's administration in 2012. While this reform was viewed by the Calderón administration as a positive development, it was not as aggressive as originally envisioned and lacked reforms to some tax exemptions that have been used for tax evasion. An overhaul of the tax collection laws will be instrumental in reducing the federal budget's dependence on oil revenues if, as is expected, oil output continues to decline (Lange, 2009).

This is problematic for Mexico because the country's oil reserves have been falling steadily. Investment in production of oil has not been sufficient to increase or even maintain extraction rates and consequently oil output in May of 2009 fell to its lowest under normal conditions since 1993 (Lange, 2009). Compounding Mexico's difficulty in developing additional oil fields are falling oil prices. Even if Mexico increases investment sufficient to maintain production output, revenues generated from output will be significantly lower than last year due to the decline in the price of oil which means an overall decrease in funds available to the government. According to the Mexican Finance Ministry revenue in the January-May 2009 period fell 6.9% from the same period of 2008, with oil income down 24% and non-oil tax collections down 15% (Harrup, 2009).

2.4.2 Taxes and Fiscal Coordination

As mentioned earlier, Mexico's government is highly dependent on oil revenues and its tax revenues are low compared to other countries of the Organization for Economic Cooperation and Development (OECD) and other Latin American nations. Mexico's government revenues as a percentage of Gross Domestic Product (GDP) are around 19%, compared to around 25% for the U.S. (Table 2.5).

Mexico collects considerably less tax revenues than the United States even though the federal income tax rates are not considerably lower. There have been a few proposals to expand the currently limited authority that states have to levy payroll taxes.

Table 2.5: Mexico and U.S. Tax Rates

	Mexico	U.S.
Top Marginal Personal/Corporate Income Tax	28%	41.4, 35%
Top Tax Rate on Dividends	29%	35%
Value Added Tax (VAT)	15%	None

The Products and Services Special Taxes (*Impuesto Especial Sobre Producción y Servicios*, IEPS) which taxes alcohol or alcoholic beverages, tobacco and tobacco products, and fuels also provides the states with revenue. The IEPS Law establishes the percentages that state governments can take from the taxed products.⁵ However, very few states, if any, get the tax participation prescribed by the IEPS Law since they adhere to the FCL.

The FCL created a system by which states give away their rights to obtain the above-mentioned percentages (and some other fees) in order to be eligible to receive direct transfers from the federal government. Those transfers come from the general revenue fund. The fiscal coordination system has been evolving since its inception in terms of the eligibility conditions, mandates, amount of funds, provenance of such funds, and evaluation systems.

If the states sign up to the fiscal coordination system (which hitherto all of the states have done) they forfeit their participation on specific excise taxes levied in their territories, but gain access to the general participations fund. The FCL guarantees that 20% of all the general government tax revenues are distributed back to these states. This includes all levied taxes as well as oil and mining extraction license revenues.

The FCL established a formula to allocate resources between the states: 45.17% are apportioned strictly as a proportion of their population. Another 45.17% are allocated through several formulas taking into consideration social development objectives, and indicators. The remaining 9.66% is apportioned in inverse proportion to the states' population.

Despite these difficulties, the federal government has proposed a number of times to allow states to include an up to two percent sales tax on top of the Federal VAT. No state took advantage of this allowance. Most states rely on the federal government's transfers and other locally levied taxes, for example property taxes. The FCL has a number of provisions to force state, and more precisely, local (municipal) governments to improve their property tax collection. There is also a provision to allow local governments' access to a minor fund for maintenance of toll bridges operated by the federal government.

The Mexican government collects taxes for new vehicles as well as an annual vehicle registration tax. These are federal taxes (although the registration tax is administered by the states) and are not included among the 20% of general funds redistributed to states. States have the option to get back a percentage of the vehicular taxes if they sign separate agreements with

⁵ Producing states can obtain 2% of the tobacco tax, 2.8% of the beer tax. States can obtain 44.5% of the beer tax revenue assessed when consumed in that state, 18% of the tobacco tax and 10% of the fuel tax.

the federal government. Currently those agreements are related to the responsibility of state governments to build and maintain a vehicular registration database.

OECD has recommended (OECD 2007) that no increased transfers should be given to state governments until they improve and increase their local revenues. It also raised the question of “lack of accountability” of state and local governments, especially related to funds associated with social infrastructure investment projects financed through transfers from general revenue. While the Fiscal Responsibility Law has substantially improved the oversight (as is explained in the next section), OECD considers that there are still many actions to pursue and gives some recommendations. Among these is included a recommendation to renew the ability of states to levy final sales taxes (as has been offered in the past), make the vehicle property tax a state level tax instead of federal and create incentives for the states and municipalities to strengthen their revenue capabilities. Historically, because there was—and still is—significant variability in terms of quality of planning, budgeting, execution, and oversight between the different states and municipalities this has been one of the factors that have impeded the successful implementation of infrastructure programs.

2.4.3 Budget Execution

A budgetary impasse in 2005/2006, in which Congress approved the PEF after the deadline, prompted the Mexican government to issue a series of changes in March 2006—including creating the Federal Budget and Fiscal Responsibility Law (FRL) which is now part of the main regulatory framework of the Federal Budget. This Constitutional change amended the budget’s submission deadlines by the executive to September 15, instead of November. During the past 20 years, Mexico’s federal government has improved PEF’s oversight by issuing a series of directives and creating better practices. Many of the directives were also integrated and improved in the FRL in March 2006, to strengthen the overall fiscal framework.

Among the elements that are included in FRL is the confirmation of a strictly ‘pay as you go’ system, with no unfunded mandates. Every single new proposal to increase or create specific programs needs to include a direct new source of financing or a compensating expenditure offset in another program. However, it should be noted that Mexico has run a deficit this past year to counteract the global financial crisis. The FRL approach also reinforces the practice of using non-recurrent or non-renewable resources (as the ones from increased oil revenues should be considered) to non-recurring projects such as infrastructure projects. The new directives also put more emphasis on multiyear budget planning and considerations for infrastructure programs and eliminated the need for annual reauthorization. In this way, the Mexican government is attempting to give more continuity to ongoing projects and more certainty to new ones.

Another element of the FRL is a very explicit set of guidelines to assign resources to the four specific funds: States Revenue, Oil, PEMEX Investment Stabilization Funds, and for specific infrastructure projects, and how these are used. These four funds are not created through regular or dedicated tax or oil revenues. The funds are endowed by extra oil and tax revenues. Figure 2.3 shows how these extra revenues are disbursed and allocated.

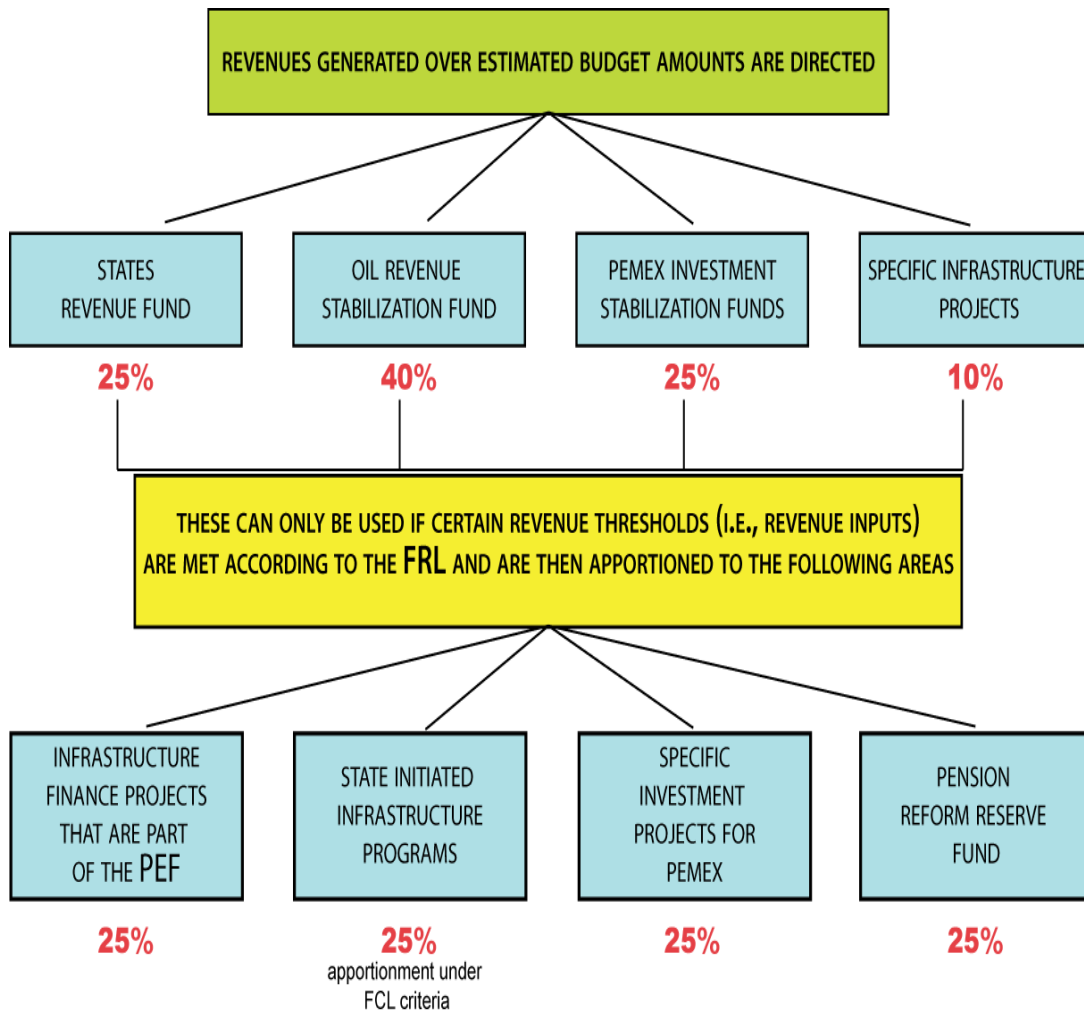


Figure 2.3: How Revenues Over Budget Estimates are Directed in Mexico

In all of these various apportionments it should be noted that infrastructure – refers to all infrastructure development – water, energy, communication, social projects (e.g. schools and hospitals), and transportation. Transportation infrastructure, therefore, competes against many other projects on an ongoing basis.

2.4.4 Infrastructure Project Finance

There are specific budgetary considerations regarding infrastructure projects. The FRL allows and establishes multiyear commitments (Articles 32 and 50). The pay as you go system for productive investments is further enshrined in Article 18 of the Public Debt Law (*Ley General de Deuda Pública*). Article 34 of the FRL establishes a procedure that infrastructure projects must follow to be considered in the budget proposal as well as the criteria for project selection.

Each government agency needs to present a detailed project management program in which the infrastructure projects along with a full technical and economic impact analysis are included. State governments can also present projects to be included in the PEF. The authorization process includes a detailed analysis by an intra-cabinet committee (the expenditure-financing committee) which is required to consider four criteria in its deliberations. These are:

1. Socio-economic profitability;
2. Extreme poverty reduction;
3. Regional development; and
4. Complementarily with other projects.

The Mexican government has planned to finance infrastructure projects from three sources of funding: PEF, Asset Proceeds, and PPP projects. Asset Proceeds sources come from the concession of existing assets— monies raised are used for debt repayment and construction of new projects (typically through new private concessions). PPPs include the construction of every new project or a direct participation of private sector in enhancement of existing ones.

2.4.5 Public-Private Partnerships

One of the most frequently used methods for infrastructure financing in Mexico is the Build-Operate-Transfer (BOT) PPP model, especially in the highway sector. The BOT model allowed Mexico to expand its privatization programs by allowing private investment capital to play a substantial role in infrastructure financing. This in turn released funds and financial pressure off the government enabling the construction of much needed social and environmental infrastructure (Eaton, 1997). Under the BOT model, private companies secure an exclusive license from the government to collect revenue and construct, manage, and operate a project for a fixed time frame (Eaton, 1997). After the established time frame, the facility and its assets are transferred back to the Mexican authority. Articles 25, 27, and 28 of the Constitution outline the general principles that create the Mexican concession regime as well as provide authority to grant a concession.

Mexico's government also restarted a new process of privatization of highways after almost all of the highways that were under concession in the 1990's went bankrupt and fell back into the government's hands. The severe liquidity and solvency problems faced by private toll road companies after the 1994–95 financial crisis led to a government rescue effort in August 1997. This was achieved through the use of a trust fund established within the National Bank of Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*, BANOBRAS) called Trust for Supporting the Recovery of Licensed Highways (*Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas*, FARAC). As a result of the rescue operation, the trust fund acquired both the assets (the toll roads and the income stream generated by the tolls levied) and the liabilities of the toll road companies. Part of the bank debt of the toll road companies was restructured into long-term UDI-denominated Notes (*Pagarés*) under the different debtors' support program in place before August 1997 (Giugale, et al., 2001). As of March 2007, FARAC's debt, as guaranteed by the federal government, amounted to MXP \$165 billion (Aguilar, 2007).

FONADIN

On February 6, 2008, Mexico's federal government unveiled the creation of a new National Infrastructure Trust Fund (*Fondo Nacional de Infraestructura* FONADIN) with a starting endowment of close to US\$4 billion. This Fund was announced as part of the federal government's fiscal policy in response to a slowdown in economic activity. The fund was formed by the merger of two existing funds plus an additional influx of fresh resources from the concession package that was awarded to ICA/Goldman Sachs. The existing funds amalgamated into the FONADIN were FARAC and the Infrastructure Investment Fund (*Fondo de Inversión en Infraestructura* FINFRA).

Mexico is seeking to insulate infrastructure funding from the current economic crisis through FONADIN. FONADIN is funded through concessions let out of FARAC of roadways currently held by the government and new infrastructure concessions, the money is then used to fund projects not suitable for private investment, such as the Mazatlán-Durango highway. FARAC holds an estimated \$35 billion in toll road concessions. These will be developed over the next 5 years through eleven separate concession packages. (Hayward, Nov 2007). The first tender raised \$4.8 billion for FONADIN (Hayward, April 2009). The government hoped to add additional money to the fund with the concession of the FARAC II package, known as the *Paquete del Pacífico*. However, when the call for bids on the FARAC II package was released, it failed to generate significant interest, and the two bids received did not meet the minimum price requirements. The government tender call was declared void by SCT and the package was consequently split into two separate tenders. The first tender of this split, totaling \$2.5 billion, was released in April 2009 (Hayward, April 2009).

The revenues directed into FONADIN will be used to finance infrastructure projects that cannot be structured as a PPP type project as well as towards paying off a portion of the debt accumulated by FARAC. The process through which the federal government directs the funds received from the new concessions to the construction of new highways or other infrastructure projects is called Asset Proceeds scheme. It is an important portion of the financing of the projects included in the NIP.

After the highway bailout process of the 1990's, the Mexican government has taken steps to clarify regulations related to PPP's. While there are variants of PPP's in different infrastructure projects and assets like airports and ports and some exploratory attempts in hospitals and schools, the main focus remains in highways.

The Mexican government has presented new guidelines for the Asset Proceeds and Concession schemes mentioned above. Among some of the innovations are the use of longer terms (30 years) for highway concessions, determination of second place when a winner is announced (the second place would be the substitute for the project if something goes wrong), and determination of rules for public co-investment (SCT, 2007).

While there has been considerable improvement through the issuing of guidelines, PPP regulations are still part of a collection of specific articles in several other regulations and laws. Mexico's Finance Ministry (*Secretaría de Hacienda y Crédito Público*, SHCP) has recommended the consolidation of such regulations and the creation of a dedicated entity to regulate and monitor the different PPP projects.

2.5 Acquisition of Transportation Right-of-way

The Constitution sets forth the principle of inviolability of property by providing that private property may be taken only for public purposes and by means of certain formalities which must be strictly complied with. Mexico's processes for expropriation of land (eminent domain) differ from the U.S. Article 27 of the Constitution outlines two types of expropriation. The first is expropriation for reasons of public utility which gives the owner a fair compensation. The second is an expropriation for the public interest, which does not require compensation even though the value of property might be affected (Starnier, 2002).

The federal government is vested with the power to make expropriation in connection with any property or enterprise within the jurisdiction of the federal government; whereas the States are vested with the power to make expropriations in connection with property within their jurisdiction. The federal government can also make expropriations of property within the confines of the States. The Constitution directs that the federal and state laws shall determine within their respective jurisdictions those cases in which the occupation of private property is to be considered a public utility.

A key term in the valuation of property in Mexico for the purposes of eminent domain is the *catastral* value. This is the amount at which the property is valued for taxable or ratable purposes. It has been an important source of social conflict, since the *catastral* value is, in most cases, considerably lower than the market value of the land. In recent years, the government has started to sometimes offer land owners amounts significantly in excess of the *catastral* value in order to expedite the process and avoid conflict. Another major difference between eminent domain regulations in the U.S. and Mexico is that U.S. regulation provides that if the owner is not satisfied, they may sue the government agency to allow for a court to determine market value. In Mexico the only matter that a tribunal can review is the increased value which the property may have acquired through improvements made after the *catastral* value was determined.

Another area that is different regarding property in Mexico than the U.S. is the holding of communal land. The 1917 Constitution empowered the federal government to ban and punish monopolization of land which had hindered development. This was accomplished through land reform which divided up privately held land and distributed it to landless members of common farmlands (*ejido*). This category of property ownership is still widespread within Mexico and regularly impacts transportation processes and projects when land is acquired through eminent domain. While the impact of *ejido* land ownership bears some resemblance to the presence of pockets of tribal lands in the United States, the category is much more prevalent within Mexico and the impacts from uncertainties in ownership of *ejido* land are constantly causing ROW-related challenges. For example, in 2007 *ejido* landowners sued regarding the expropriation of land for the port of Altamira 25 years earlier. In 2008 a Mexican court found in favor of the *ejidatarios* and declared as void the two out of the five expropriation decrees applicable to lands that were taken for Altamira, and, awarded a fine of MXP\$1.2 billion (approximately to US\$120 million) to the approximately 85 *ejidatarios* in these two *ejido* groups. There have also been

reports indicating discontent over sale of *ejido* land in the vicinity of the proposed port at Punta Colonet.⁶

2.6 Concluding Remarks

Mexico has a centrally controlled system for transportation planning, development, and financing. States have had little authority to raise taxes for infrastructure development, and were often not involved in the planning of major corridors. Mexico's system for financing infrastructure was reliant on general revenue, which are heavily dependent on PEMEX revenues and have waxed and waned based on global oil prices. This has meant that infrastructure investments have not kept up with changing demands. However, over the past 15 years changes have been enacted in Mexico's Constitution and laws to change the way that Mexico plans, finances, and develops infrastructure. Most notably, the movement of control for many of the multimodal assets (ports, rail, and air) from being a strategic to a priority activity and the use of PPPs: Allowing private sector involvement in these modes. President Calderón made infrastructure investment and development a cornerstone of his administrative agenda: laying out an aggressive national infrastructure plan in 2007. The success of this plan, however, was reliant on potential tax reforms, and a restructure of PEMEX which have not yet been fully implemented. Other political and economic events have also interceded since Calderón came to power further eroding the potential to pass new reforms during his remaining 3 years. The next chapter discusses the state of practice for planning and implementation of infrastructure projects.

⁶ Further discussion of this can be found in the case-study technical memorandum on the CD-Rom that accompanies this report.

Chapter 3. Planning and Implementation: State of the Practice

This chapter documents the state-of-the-practice in planning and implementing transportation infrastructure projects in Mexico. Specific emphasis was placed on planning, project scheduling, budget constraints, right-of-way acquisition, environmental clearance and permitting, and private sector and stakeholder involvement for highway development. Information was collected through document reviews supplemented by interviews with officials, SCT, and private sector entities. It illustrates how Mexican officials work within constitutional, regulatory, and financial constraints to develop infrastructure projects that are part of, or consistent with, the NIP. As discussed in Chapter Two, the constitutional framework and budgetary process used by Mexico is fundamentally different from that of the U.S. Furthermore, at every stage of the infrastructure development process, actors are influenced by other constraints that may be less overt but equally salient in determining how projects are developed, what options are available to decision makers, the speed at which different steps in the process can be advanced, and the extent to which coordination between different levels of government and the private sector are undertaken.

3.1 National Infrastructure Plan Project Review

According to sources, the NIP— as it currently exists— grew out of a coordinated document that was prepared by a group of leading private sector engineering companies, with support from champions within the public sector, and was sent to the president in January 2007. This was the first time that the engineering community had assisted in producing a plan. There was discussion of collecting a comprehensive project list in the last 2 years of the Fox administration. However, it was decided, given the fact that the Mexican president is ineligible for re-election and the power of the Fox administration to launch major initiatives was waning, to wait until the new administration came to power. What was most striking according to sources is that *“for the first time in the three decades there is a coordinated plan in place and multi-period authorizations of funding from the Treasury that make long term planning possible.”*

SCT noted that all 100 transportation projects in the NIP were reviewed by SCT (at the federal and regional level) as well as with the state governors in a collaborative process. The selection process was based on criteria including, social, economic, traffic and revenue, environment, and others. Specific guidelines determine the information requirements to be included in the national development planning processes and investment projects enacted by the Investment Unit of the Revenue and Public Credit Secretariat (which governs the development of investment projects). These are then tied to the objectives of the highway program, which are:

- Increase economic competitiveness
- Reduce regional inequalities
- Expand communication and avoid rural community isolation
- Create well paid direct and indirect labor
- Promote national and regional development

According to SCT, there has been an effort to strengthen decentralization therefore the highway planning group conducts meetings with all the state level Public Works Secretaries to assist in producing the highway project lists that are included in the NIP. These meetings also provide input on determining the financing mechanism. SCT noted that the guiding crux is to concentrate investments in projects that could transform the geography of the regional economy, prioritize the conservation of highly traveled routes, leverage private sector investment to increase public investment, and promote decentralization of the highway network by transferring the budget and responsibilities to the states and municipalities. SCT and other private sector interviewees highlighted the role that the Mexican Congress is playing in determining new projects, as well as adding to the list developed by SCT and its regional centers. As part of this, the Mexican Congress has increasingly given more money for projects than was previously authorized in the budget. This requires SCT to justify these projects to the treasury, which is in charge of authorizing disbursements. If the project does not fill the criteria outlined in the NIP goals, the treasury will not release funds.

3.2 Developing the Highway Program

The NIP-Highway Program will be financed through public and private monies, according to the Expenditure Budget. Table 3.1 shows the investment scope.

Table 3.1: Mexico's Highway Program Investment Scope and Requirements

Sub-Program	Distance (KM)	Investment (Pesos Million Dollars)	Financing Source		
			Expenditure Law	Concession	Asset Exploitation
Strategic Modernization of the Network	9,023	126,569	73,076	21,303	32,190
Beltways & Access	1,320	44,328	1,868	23,120	19,340
Interstate Highways	1,757	11,530	11,530	-	-
Additional works to the federal network	1,338	14,564	14,564	-	-
Rural roads and feeder roads	4,000	20,000	20,000	-	-
Sub-Total	17,438	216,991	121,037	44,423	51,530
Federal network conservation	44,757	40,392	-	-	-
Studies, projects and right-of-way acquisition	-	30,000	10,000	5,000	15,000
TOTAL	62,195	287,383	171,429	49,423	66,530

• Source: SCT, 2008

The program is constituted of the following subprograms:

- Federal highways conservation in order to preserve the road assets
- Strategic modernization of the network, to extend and build stretches according to numerous specifications, including:
 - Completing beltways and access roads to improve the connectivity between the most important cities, ports, borders, and tourist regions, in much the same way as the interstate and state highway system in the United States was developed to achieve these goals
 - Completing interstate highways to incorporate interregional axes and improve communication between regions that are currently under-developed
- Additional federal works to remove bottlenecks, and improve segments that lead to local dis-connectivity especially on rural roads and feeder routes to enable access to isolated communities

According to SCT the broad goal in building out the highway system in Mexico is for it to function as a true comprehensive network that does not disadvantage any one region. While there are many modern and impressive road linkages in Mexico, the lack of comprehensiveness of the highway network has been an impediment to Mexico's internal trade.

As part of this process, SCT was creating a new highway numbering system analogous to that of the U.S. interstate highway system. The last time this numbering system was reviewed was in 1968. While this is mostly a symbolic move, it underscores the need to envision the Mexican highway network as a system. The new numbering system was released during the latter part of 2008 and is expected to lead to a reduction in confusion due to duplicative numbers that exist within the current numbering system. The new system will be longitudinal as well as Gulf/Pacific based. Local road numbering will remain with local jurisdictions.

As part of the highway program's development process, SCT has been given two different sets of goals for whether projects are funded through the appropriation process or through a PPP.

Table 3.2: Highway Program Development Process Goals

Highway Program	
Funding: Appropriation Process	Funding: PPP
<ul style="list-style-type: none"> • Maintain the construction and modernization budgets around MXP\$15 billion per year, in real terms, and allocate 80% of the budget to 30 strategic projects that need Appropriations law monies. • Keep the annual amount of the rural and feeder roads around MXP\$6 billion, in real terms, and allocate a third of the money to the 15 most important interstate projects. • Allocate at a minimum MXP\$8 billion annually to the federal network conservation program and MXP\$2 billion annually to strengthen the preparation of studies and projects related to construction works and right-of-way. 	<ul style="list-style-type: none"> • Develop a strategy to win support of governors, legislators, and representative groups. • Development of agreements on the terms of effective cooperation with state governments, INDAABIN, and local authorities to release the ROW required for the program. • Strengthen SCT's institutional capacity in order to prepare the projects, manage the bids, and follow up on the construction and concession management.
Initial Funding Allocations	
Initial MXP\$35 billion (public funds) for initial payments, create contingent funds, studies, projects and purchase of ROW	Annual payment (from the Appropriations Act) for PPP development
<p><i>SCT noted that it will be reviewing ways to find new finance sources that may allow this scheme to continue after the act sunsets.</i></p>	

3.3 Planning

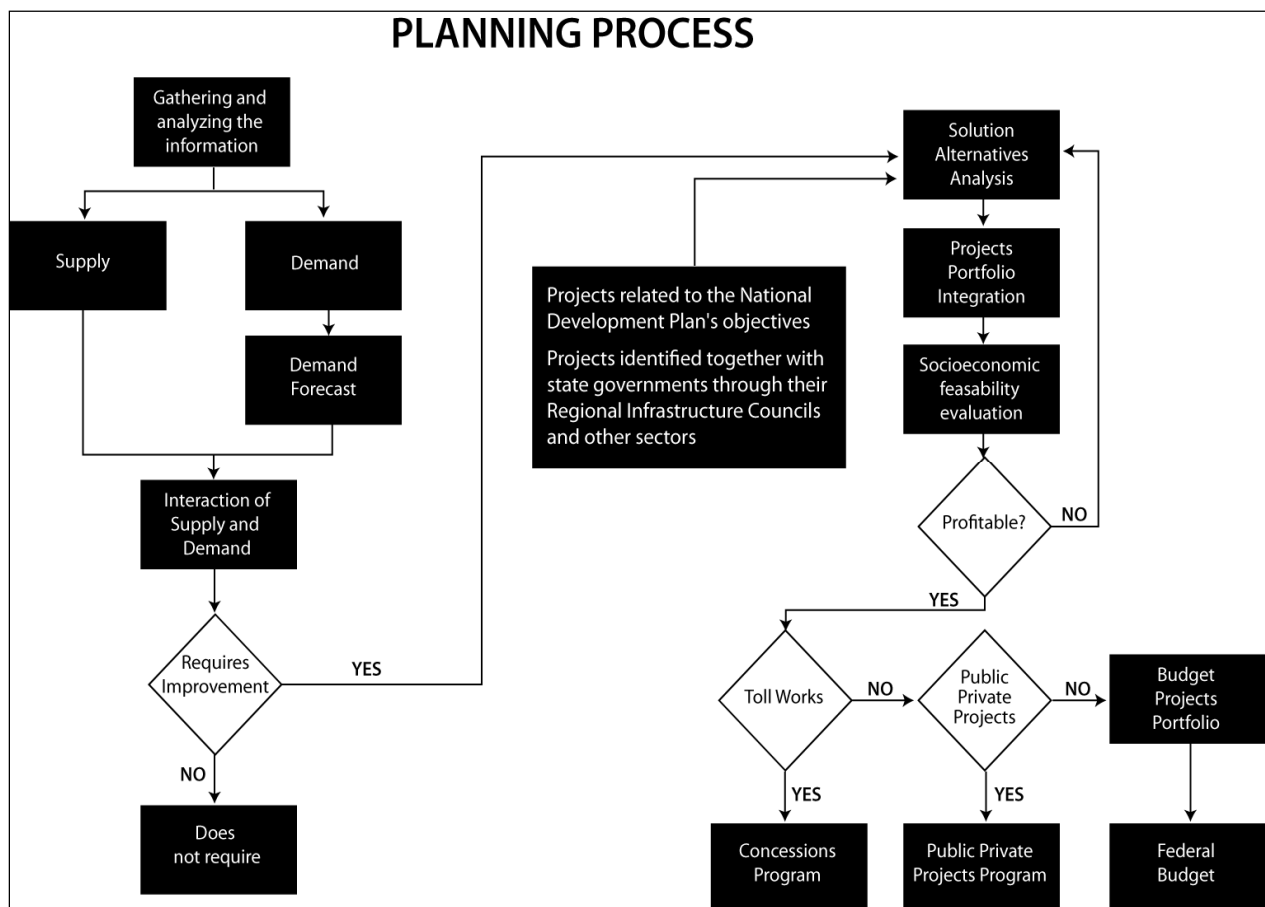
According to SCT, past planning processes suffered from the fact that engineers would receive construction orders for a particular project but would not be aware the rationale underlying the project or how it originated. As a result, there was little attempt by SCT to justify projects or perform a binding cost benefit or alternatives analysis. Today, however, SCT at the planning stage has to develop financial rationales for every proposed project which are presented to the Treasury (SHCP). According to SCT, top down centralized decision making, planning, and budgeting have now been replaced with an increasing focus on markets, policy adjustments, and governance with greater possibility for feedback from lower levels of government. The major goal-oriented criteria underlying project selection are:

- Socioeconomic profitability;
- Sustainable environment;
- Poverty reduction;
- Possible impacts to minority groups; and
- Economic development.

SCT has to take into account how proposed projects address these multiple factors to justify the projects. As a result project analysis demand has increased in the past few years and the focus of SCT has changed within the setting of project analysis. This has meant that SCT has had to restate and develop new analysis techniques as better tools for discussion and justification for project development. They have also had to adapt the methodologies for their analysis to:

- Be more flexible
- Be easily understood by multiple sectors and segments of society
- Create alternative outcomes

This occurs over multiple phases in: planning, design and evaluation, programming and budgeting, and project execution and operation. Figure 3.1 shows SCTs formalized planning process for developing projects: Note that projects related to the NDPs are also included in this process.



Source: SCT

Figure 3.1: SCT's Overall Planning Process

Planning processes for SCT are increasingly becoming more stringent. New procedures established throughout 2008/2009 are a first attempt from the current administration to formalize deadlines for submitting the central plan components (SCT 2008). No such formal deadlines existed for previous administrations. The administration is also setting up a deadline process for all SCT regional centers. Completing the transition to make the planning process a much more formal and rigid process would make the Mexican process more similar to that of the U.S., where the U.S. DOT's and Metropolitan Planning Organizations are required to develop planning documents such as the State Transportation Improvement Plan Unified Transportation Plan and Metropolitan Transportation Plan's.

SCTs planning process utilizes population projections as well as other demographic, economic, social, and environmental factors. Like TxDOT and other state DOT's, SCT uses the TransCAD modeling program to develop their transportation plans. The population projections used by both the government and private sector actors are developed by the State Statistical Bureau (*Instituto Nacional de Estadística y Geografía*, INEGI). INEGI conducts a decennial census. Although the census does not include any questions specifically connected to transportation, there are other surveys, such as an economic census, that contain information about transportation modes, costs, infrastructure, etc. These surveys are used by transportation planning groups in SCT and the Mexican Transportation Institute (*Instituto Mexicano del Transporte* IMT) to develop transportation plans, and to generate data about transportation needs and uses.⁷

INEGI works with the National Committee on Population (*Consejo Nacional de Población* CONAPO)— a federal agency responsible for forecasting population using the Census data. These forecasts are available for the aggregated population, as well as for different clusters, such as, gender, age, location, etc. CONAPO is also responsible for creating the Marginalization Index. This is an index based on socioeconomic variables that measure the disparities that certain state, counties, or localities face. The marginalization index played a direct role in defining projects that were inserted into the NIP to address the economic, socio and geographic disparities that had occurred in transportation infrastructure development in Mexico.

Marginalization Index Variables

- illiterate population > 15 years,
- population without completed elementary school of >15 years,
- occupants in houses without drainage or exclusive sanitary service,
- occupants in houses without electricity,
- occupants in houses without running water,
- houses with level of overcrowding,
- occupants in houses with dirt floor,
- population in localities with < 5000 inhabitants,
- occupied population with income up to 2 x minimum wage level

SCT noted that many years ago there was some coordination between planning for different modes of transportation, specifically between roads and railroads. That coordination however, was lost during the process of railroad privatization, and subsequently there has not been an integral planning approach over the past 20 years. SCT is attempting to restart this process, but the coordination is essentially centered on planning for intersections between rails and roads.

⁷ <http://www.imt.mx/default.htm> This institute has a publication Manual Estadístico del Sector Transporte which main objective is to provide an overview in the latest evolution of transportation in Mexico.

3.3.1 Economic Analysis

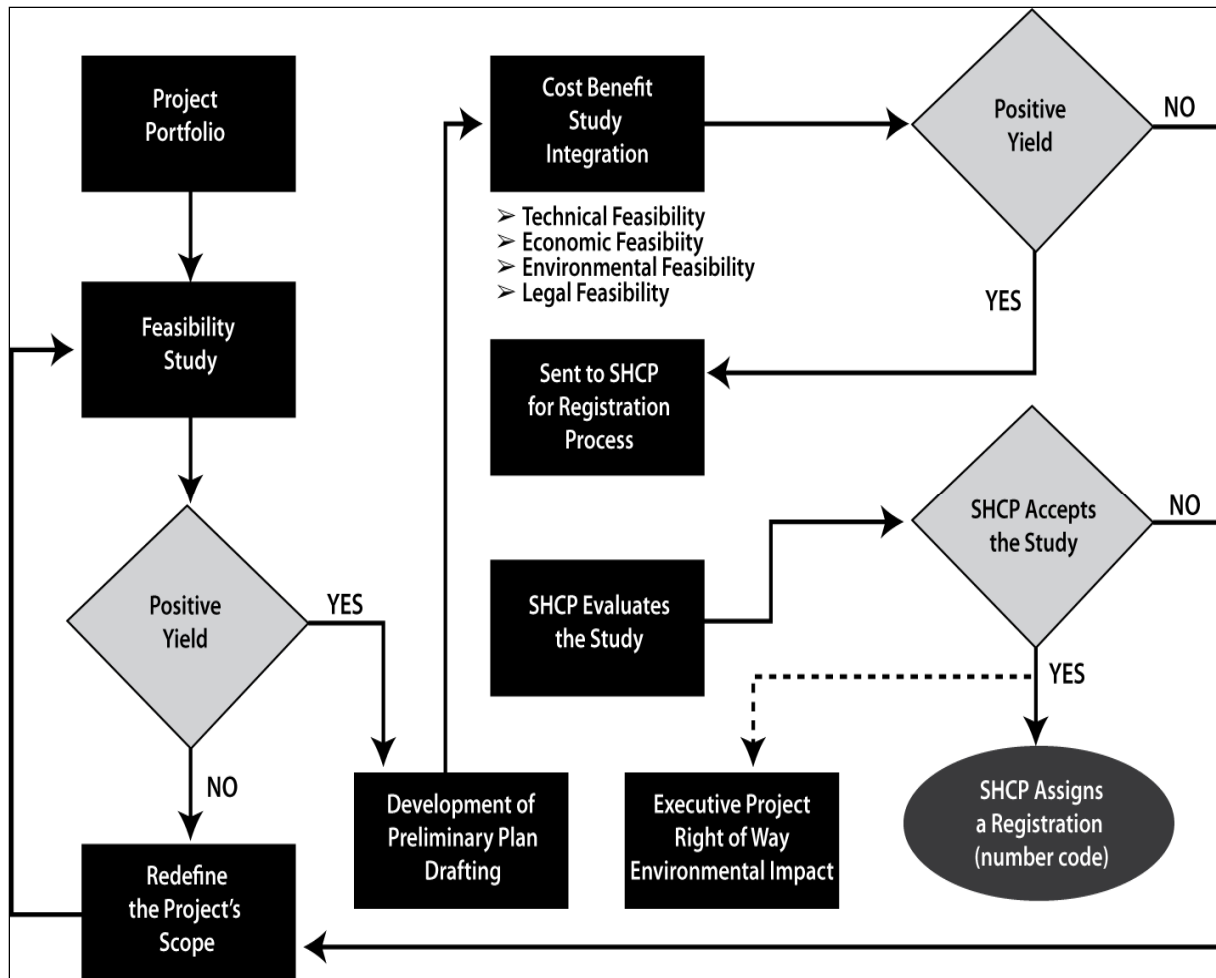
As discussed in Chapter Two, many of the projects in the NIP are part of a strategy to achieve goals that extend beyond directly improving transportation linkages including job creation and decreasing the wealth disparity between regions. SCT has been changing its project process to define objectives and strategies to achieve these interrelated goals and to base these strategies on defined inputs, components, and performance indicators as well as undertaking stronger risk analysis.

Monitoring and impact assessment is now required in project execution. Economic analysis is used to design and select projects (and alternatives) and discern the chief beneficiaries. The process is also utilized to evaluate environmental risk and measure the project's 'sustainability'. This includes factors listed earlier as well as assessment of the possible impacts towards poverty reduction. The process must also incorporate any actions that will ameliorate environmental or social impacts. The economic analysis also includes a fiscal analysis to determine if the project will be undertaken as a public or private sector project as well as determining its impact. Figure 3.2 shows the process and evaluation criteria: socioeconomic, technical, environmental, financial, institutional, and commercial.

There is a structured cost benefit analysis process for project planning and development. This consists of an evaluation of the project at a pre-feasibility level for projects of MXP\$150 million or more. This includes detailed monetary quantification of the benefits and costs. For projects with a projected investment of MXP\$20 to MXP\$150 million, a simplified cost benefit study may be included. For projects of MXP\$20 million or less, a mere economic justification may be presented. According to SCT the links between the investment projects portfolio and different finance schemes are:

- Appropriations Act – Budget ceiling is determined by the SHCP
- Concessions – Financial capacity of private parties
- Projects to render services – Budget ceiling is authorized by the SHCP
- Asset use – Financial capacity of private parties

Figure 3.2 shows how the project analysis process is structured. After the initial feasibility study is undertaken, SCT will then conduct further cost-benefit studies as well as other feasibility studies before the project is submitted to treasury and is formally assigned a project number.



Source: SCT

Figure 3.2: SCT Project Planning Process

SCT also noted that there are requirements for the planning and budgeting of projects. These include a registration number from the Programs and Projects Portfolio of the SHCP Investment Unit (which is the projects identification number throughout the duration of its execution and development) and a third-party expert report if the project is less than MXP\$500 million.

SCT noted that there are some factors that affect the ability of SCT and the SHCP in the process of conducting cost-benefit analysis including:

- Lack of qualified personnel at the SCT regional centers, States and Municipalities
- Insufficient time to perform the studies
- Information related to the projects may be incomplete
- Budget allocation for projects *not* in the NIP which do not have technical files

- Update of the registration number every 3 years

This process also includes a review of alternative considerations— i.e. build and no-build. Cost and benefit covers government and highway-user costs. According to SCT government costs include construction (materials, equipment, labor, and ROW) and maintenance (routine, preventative, and corrective). Highway user costs include travel time, incident management cost of accidents, and the cost provision for ITS technology to improve travel time.

3.3.1 Post Project Evaluation

Once a project is developed a post project evaluation is undertaken to review how the project matched the feasibility and other cost-benefit analysis expectations. SHCP's Investment Unit must select at least ten programs each year. The party controlling the project (public or private sector) is required to conduct this evaluation. Agencies and entities in charge of execution of these evaluations must be notified by the Sub-secretariat before the end of January each year.

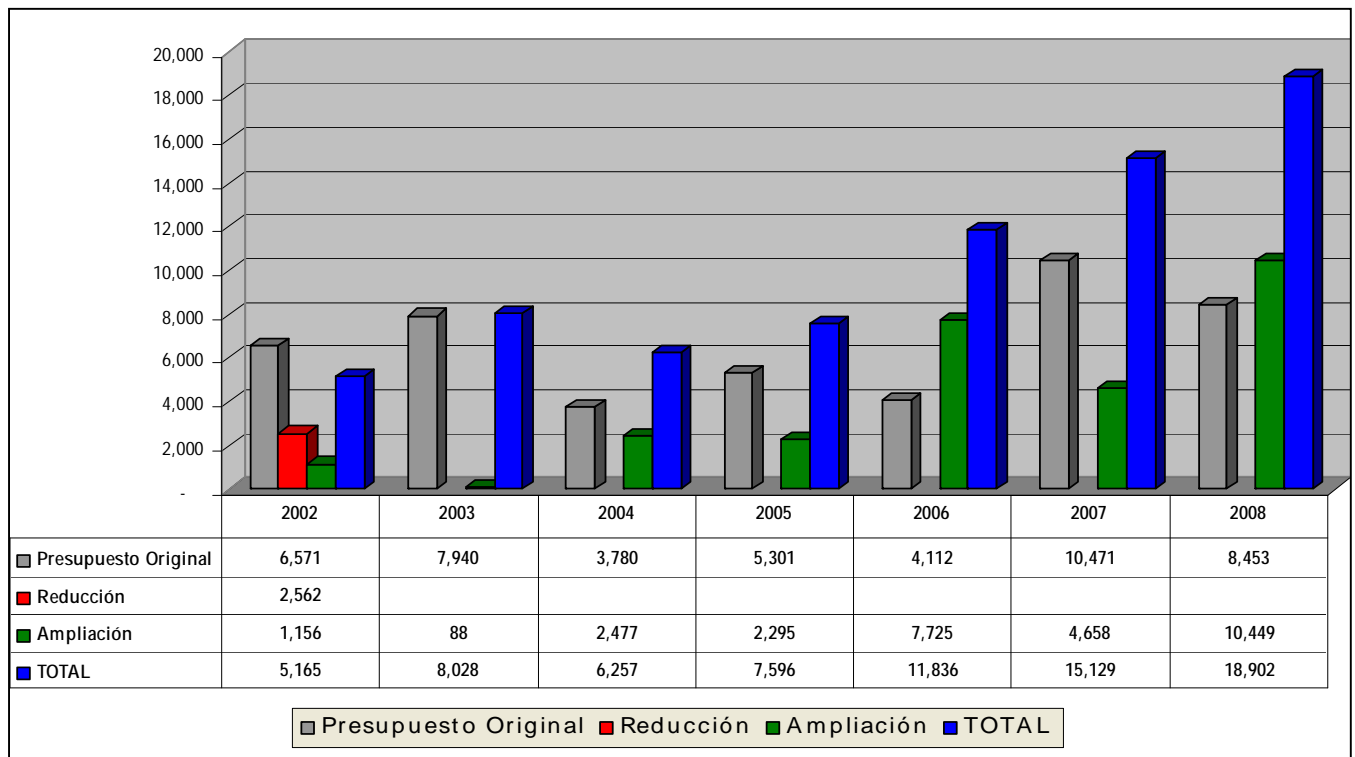
3.4 Financing Highway Development and Maintenance

As outlined in Chapter Two, Mexico has a funding process centered on the federal government, where most of the money from taxes and other revenue not spent directly by federal agencies is disbursed to the states by the federal government. The roadway network of paved and unpaved roads within Mexico totals slightly over 300,000 kilometers. SCT is broadly responsible for maintenance of this system in its entirety, either through performing maintenance directly or monitoring the performance of state entities. Similar to the situation in the U.S., SCT is not responsible for construction or maintenance of local highways (i.e., off-system) in cities. In much the same way as TxDOT organizes through 25 districts, SCT's 31 regional offices control maintenance and construction for their area. Due to formulas based on population and need, significant disparities exist between what various states receive and further disparities emerge once funds have been further distributed to different areas of states.

3.4.1 Congressional Appropriations

As noted in Chapter Two much of the Mexican government revenue— roughly 40% in recent years— comes from PEMEX. The NIP was developed when oil prices were high and is dependent to a certain extent on oil prices remaining at elevated levels. The fall in oil prices has affected Mexico's projected budget and falling output by PEMEX is adding to the budget crunch. Nevertheless, from the perspective of the Calderón administration, the decline in oil prices from the historic highs seen at the beginning of the President's term have had a silver lining in that they have furthered the administration's argument that petroleum related income is an unreliable foundation on which to build Mexico's long term fiscal security.

SCT noted that while the agency did respond to the windfall profits of oil sales to increase its annual requests and meet existing needs, the Congress chose to allocate even more funding to infrastructure programs than was requested by SCT. Figure 3.3 shows data from 2002 through 2008 on the additional budget allocations that SCT received (*TOTAL*) on top of its original request (*Presupuesto Original*).



Source: SCT, 2008

Figure 3.3: Mexican Congressional Appropriations 2002–2008

3.4.2 Public Private Partnerships

Mexico began experimenting with public-private partnerships in the form of toll roads in the late 1980s. The first concessions ended up failing in part because preference was given to short concession periods, which therein required toll rates to be set above the threshold most users were willing to pay. The Constitution in Mexico required a free alternative for toll roads which further undermined usage, particularly following the Peso crisis. In retrospect, it appears that concessionaires did not sufficiently research costs, ROW, and environmental issues associated with the roads. This led to underestimation of costs and problems with local residents. The government ultimately took back the operation of many of the concessions which were placed into FARAC (Engle, 2008).

Even following this initial failure, Mexico revisited PPPs because SCT could not generate sufficient funds for construction and maintenance of roads in its internal budget. The government now uses two main models for public-private investment in roads, the new concession model (asset proceeds), and the PPS model. The new model for PPPs in Mexico takes into account a company's technical, economic, and legal readiness for the project, and all bids require traffic and revenue studies. Cost overruns are the responsibility of the concessionaire, unless the change is required by SCT, in which case it is reimbursed. To avoid some of the problems with the first round of PPPs, ROW is secured by SCT before the bids are awarded.

There is also more foreign investment, and companies winning bids are often a consortium of Mexican and international companies (Engle, 2008, and 2007).

Under the new PPP model the government can grant highway concessions for a maximum of 30 years, typically for a term of 15-30 years. The concession is awarded to the company that requests the least amount of public funds (when public funds are to be used) or that best meets the technical requirements of the project and offers the largest monetary amount to SCT (when public funds are not to be used). Most of the contracts issued are design, finance, build, maintain, and operate concessions, rather than the straightforward design-build and BOT contracts that were offered previously. Typically, even with the former of these arrangements, SCT does provide some specifications for the design of the project, but concessionaires are allowed to offer alternatives during the bidding process.

The PPS model (also referred to as a type of PPP) is used for toll free roads and usually involves periodic payments from SCT to the concessionaire. These payments are partially fixed and partially based on usage (shadow tolling). The terms of these contracts are usually 15-20 years. These projects are typical for roads that are not suitable as toll roads because of low traffic volume or other circumstances (Engle, 2008). The Mazatlán Durango Highway which will be discussed in Chapter Four is one of these types of projects.

3.4.3 State Financing

In Mexico, states and municipal governments have only limited access to debt financing for infrastructure projects. Development banks have limited funds, and there are risk issues limiting private capital investments. Since the peso crisis in 1994 and ensuing debt crisis, limited private capital has been available to local governments, but regulation in 2000 is slowly changing this (Tamayo-Flores, 2006).

Mexican states do have revenue generating mechanisms available, with part of the revenues going to infrastructure, but in general these are not taken full advantage of. Among the available mechanisms are payroll/income taxes, sales tax on tickets for performances and events, and some sales/purchase taxes. Municipalities can tax property. However, many of these mechanisms are under used, and roughly 90% of governmental revenue generation is controlled in some way by the federal government. As of 2004, the most recent year for which data could be located, twenty-one states had a payroll/income tax in effect, and only five states and the Distrito Federal made use of all available revenue generation measures (Moreno, 2003).

3.5 Construction

The researchers also met with SCT's construction division. This group plans, finalizes the route, designs, and constructs projects. They are also responsible for creating a project's financial documents, overseeing environmental issues, and developing the construction timescale. This team also produces the bidding and specification documents for the Concessions/PPS projects. They are also responsible for ensuring that the private sector group is undertaking any required mitigation.

As part of their activities, they analyze route alternatives and lay these out for the committee that is responsible for making the final decision on the route to be taken. These are

presented to a four person committee made up of General Directors in SCT. This committee will pick the final route based on specific criteria which are reviewed in this specific order:

1. Technical specifications
2. Environment considerations
3. Cost
4. Social/political considerations

These criteria and order never change. This process only varies when a concessionaire is involved. According to the construction division, if it is a full PPP concession then the concessionaire makes the decision about final route.

This team also gives technical advice to state governments if requested and occasionally assist SCT regional offices to develop their plans. This division also develops highway projects with a view to future expansion.

3.6 Environmental Review

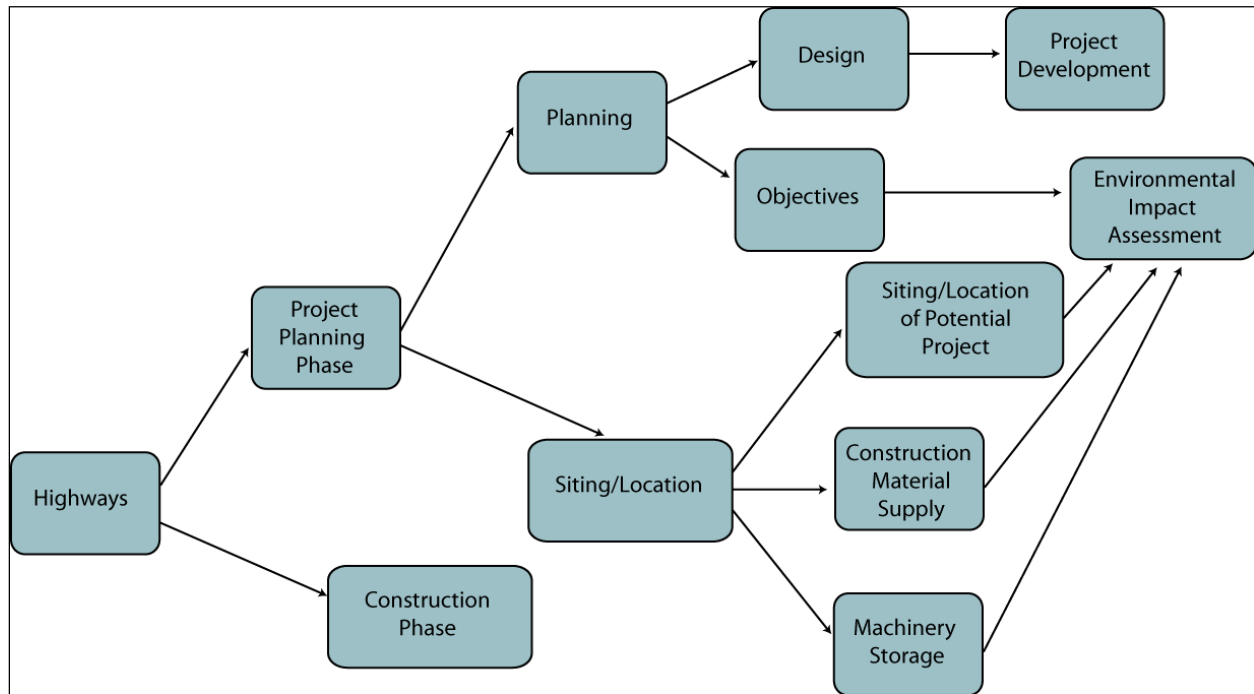
The research team met with SCT's Environmental Division and SEMARNAT to gather more information on the environmental process. They also met with consultant groups who are involved in developing environmental impact assessment documents. Finally the research team met with two non-profit groups in Mexico City, the Center for Sustainable Transport in Mexico City and Centro Mexicano de Derecho Ambiental (CEMDA). The researchers also gathered environmental impact statements, where they were available, for the case studies that will be discussed in Chapter Four.

3.6.1 SCT's Role

According to SCT, the agency takes the lead regarding the environmental reviews for SCT financed projects, although occasionally these will be put out to bid and the private sector will undertake the review; however, this is very uncommon. If the project is a concession or PPP project the process is different and begins with SCT authorizing the MIA. The concessionaire is then responsible for the entire environmental review process including the "*camino de acceso*" and "*banco de material*" or "*mina de material*." This "*banco de material*" includes the "change in use of soil" document and acts as approval for the concessionaire to essentially harvest natural resources that will be used within the PPP project from surrounding natural areas. Its purpose is to ensure that the developer will not adversely affect the environment through its actual infrastructure, collection of materials used to build, or its building process. Sources noted that the "change of use of soil" permit is always required when projects go through forest areas. The environmental review also requires a special document Technical Study Justification (*Estudio Técnico Justificativo*) to go to the National Forest Agency (*Comisión Nacional Forestal CONAFOR*). Throughout this entire process, SCT provides feedback for the concessionaire.

Figure 3.4 shows SCT's main environmental process flowchart. According to the chart, after SCT secures ROW it secures permission for "change in use of soil," and then produces the EIA. According to the SCT, environmental review is also closely tied to ROW acquisition. Individuals involved with ROW at SCT stressed this important connection, and also pointed out

that ROW planners are required to review “change in use of soil,” which is also a main requirement of SEMARNAT.



Source: SCT

Figure 3.4: SCT’s Environmental Process

Other sources noted that there are not any binding deadlines regarding a strict timeline for completing an environmental assessment process: the analysis will take as long as is needed.

According to SCT, it is required to do an environmental review process of all proposed routes and present all possible alternatives to SEMARNAT. The relationship between the two entities was described by SCT as close and collaborative. SCT emphasized that the decision for routes is made jointly by SCT and SEMARNAT with time for discussion, clarification, questions, public involvement, and site visits. Similarly to the U.S., the assessment process takes months to complete and includes SCT’s findings that have weighed the environmental impact of each alternative route, analyzed the costs and benefits of each, and concludes with the final suggested route that creates the least environmental disruption and/or impact. The final suggested route, according to SCT, is based on both pre-feasibility studies and final feasibility studies for all aspects of the environmental and concession process which contributes to the long timelines for environmental review to be completed. SCT stressed the “*entire picture*” approach is used within this process (SCT, 2009).

Every area within SCT (highways, ports, airports, etc), has its own team for ROW, Permits, Environmental Impact Assessment, etc. instead of a centralized entity that deals with

these aspects for all projects. This decentralized structure is partially due to the divergent policies concerning ports, highways, airports, and other infrastructure projects.

3.6.2 SEMARNAT's & PROFEPA's Role

The official timeline for the review process of the EIA allows SEMARNAT 60 days to respond to the proposed EIA document; however, because of the SCT steps listed above (according to interviewee's) the entire process usually lasts much longer. This lengthy process is thought to promote a comprehensive and unrushed assessment by all concerned individuals, and "*encourages responsible behavior*" in instances that involve extreme environmental impact to the community or natural habitats.

While state and local projects are regulated by state authorities, SEMARNAT will review the EIA document(s) prepared by these jurisdictions, including those produced by state environmental authorities. State governments, it should also be noted, are required to complete an environmental assessment for their projects.

To proceed with the revision of the EIA and before that, to give the permit to change the use of soil, SEMARNAT requests that SCT prepares pre-agreements with land-owners about the project. A second permit is issued when SEMARNAT finishes the revision of the EIA. Each approval is always conditional on fulfillment of mitigation actions. According to sources, SEMARNAT can ask many times for a security deposit as this process is occurring.

During this review process SEMARNAT is also careful to outline mitigation procedures necessary for the project to continue, however, according to sources, they do not ascertain whether or not the proposed mitigation options were adhered to. Mexican citizens can also turn to Federal Attorney's Office for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*, PROFEPA) to rectify any procedural abuses within the environmental process. It was noted by some interviewees that in reality the mitigation actions are seldom completed. PROFEPA does not (usually) have enough resources (financial, human, and technical) to be able to monitor every single project going on around the country. But they have the power (and will) to enforce rules in those cases that they are able to verify. PROFEPA, according to sources can also impose penalties from fines to restitution, changing the orientation of the project or cancelling it.

Both SEMARNAT and staffers in consultants and engineering firms gave examples where infrastructure development was delayed due to disruption of natural habitats and/or concerns by the National Anthropological and Historical Institute (*Instituto Nacional de Antropología e Historia*, INAH). One specific example is the Arco Norte project (discussed in Chapter Four) where INAH became involved when archeological finds were discovered in the path of the proposed route.

Some sources asserted that the environmental process in Mexico is still very much a 'rubber-stamp' type of process that is sometimes abused. One interviewee noted, for example, that within city limits mayors are allowed to have a tremendous amount of power and can de-rail a project by refusing to approve the environmental review. This is partially because of the short term (3 year) for mayors, who cannot be re-elected consecutively. These factors create a different dynamic in the city planning process compared to the U.S and can create a bias against long term planning.

3.6.3 Public Involvement

SCT, SEMARNAT and other sources outlined the public involvement process during SEMARNAT's review process of the EIA document as dictated by Mexican law. SEMARNAT is required to call a public meeting within each affected community. They must also publicize all project information, including but not limited to, planning dates, building plans, involved parties, etc. The internet has become a useful tool for the dispersion of information, however, flyers and signs are also posted throughout the community. During the public meetings all players (SEMARNAT, SCT, state/municipal specialists, environmentalists, community members, and consultants) come together to answer questions concerning the project. These meetings are meant to describe the project's purpose, take questions, and explain complicated aspects of the environmental/planning process. SEMARNAT invites specialists to these public meetings to explain the more advanced planning problems, to ensure that community members are knowledgeable about issues that would not have otherwise come up within the public meeting. At the end of the public meeting there is a "dictum" or decree that is signed by all players present. It is essential that an agreement is reached within this step because without it the project cannot continue. Sources noted that SCT and other agencies are now much more careful to include all information and consultations with SEMARNAT beforehand to reduce the risks of a denial. In some concessions, SCT includes the need to create environmental funds for mitigation during construction and the entire length of the concession.

The process for public complaints was also discussed. Essentially, citizens can intervene at two points in time: (i) during SEMARNAT's review process and (ii) during PROFEPA's verification process. According to CEMDA, an individual can begin to make a complaint concerning environmental procedure as soon as the EIA has been filed and SEMARNAT is about to begin its review (Mijares, 2009).

Citizens can also petition to PROFEPA to rectify procedural abuses within the environmental process. At this point, PROFEPA has 10 days to decide if they will review the complaint or give to another agency for review. If PROFEPA decides the complaint is not under their purview, they notify the individual that the issue has been transferred to the proper agency and the individual must follow up with that agency. If the complaint is relevant to PROFEPA, they will notify the party who has been accused of the environmental procedure violation that they have 15 days to voluntarily supply samples to PROFEPA for further testing. Sources commented that although this process is a good idea in theory, the ramifications of violating environmental procedure do not match the severity of damage done to the environment since a fine is imposed but it does nothing to prevent contamination or other damage. Additionally, it is not obligatory to listen to the suggestions of PROFEPA so in many ways this agency has become a beast without any teeth.

3.7 Right-of-way Valuation and Acquisition

The researchers met with SCT's ROW Division who provided the flowcharts that show SCTS ROW acquisition process, including for PPP projects (these can be seen in Appendix C). The researchers also met with private sector groups who are involved in ROW processes and provided interesting insight into how the private sector intersects for ROW acquisition. Finally, the researchers also met with staffers at the Institute of Management and Appraisal of National

Property (*Instituto de Administración y Avalúos de Bienes Nacionales*, INDAABIN) the agency in charge of all land appraisals in Mexico in February 2009.

According to SCT, all ROW has to be valued through INDAABIN. This value is always below the actual market value. INDAABIN are dependent upon another secretary during this process, the Public Function Secretary (*Secretaría de la Función Pública*, SFP). SFP are required to give reference prices for SCT to be able to acquire ROW. SFP are also responsible for valuing and providing reference values for any real estate purchase that the federal government intends to take by expropriation processes. SFP also hold all the deeds to property that has been purchased by the federal government.

According to SCT they are required to utilize INDAABINs valuation, even when this is often a very low value and nowhere near the actual market value of the property. INDAABIN, states that the goal of precisely approximating market values is impossible given that setting the market price requires willing and plentiful buyers and sellers, as well as the presence of full information, which is not typically the case in ROW acquisitions. However, INDAABIN indicated that all of the assessors follow Uniform Standards of Professional Appraisal Practice Standards and are accredited by international appraisal organizations, so valuations of land are undertaken in *as fair a manner as possible*. SCT is not allowed to undertake any private negotiations with property owners outside of this process. INDAABIN provides them only with the minimum and maximum offer for that property, as the information is confidential, and they report back to INDAABIN on the negotiations.

The actual owner is not obliged to take the offer, in much the same way as in the U.S. where an owner may disagree with the valuation. There is an interim step, before expropriation, where the property owner can petition INDAABIN for an additional review of the property. INDAABIN can authorize a higher payment to the property owner— this is paid by the concessionaire in PPP projects and by SCT in government projects from a project contingency fund. The landowner is also allowed to request his own independent assessment, which can factor into INDAABIN's decision.

If the parties still cannot agree on the offer price, it is at this point expropriation (eminent domain) comes into the picture. SCT/INDAABIN both described this as a last resort. SCT is required to prove that the land being expropriated is to serve the “public interest.” As an example of how this may affect eminent domain, a Court in Mexico in 2008 held that the expropriation decree for *ejido* land that was taken by eminent domain for the port of Altamira was null and void because SCT had failed to sufficiently indicate that the land was to be used for the public interest (Gómez, 2009.a). The court found in favor of the *ejidatarios* and declared as void the two out of the five expropriation decrees applicable to lands that were given to API Altamira, and, awarded a fine of MXP\$1.2 billion (approximately to US\$120 million) to the approximately 85 *ejidatarios* in these two *ejido* groups. The grounds for this judgment (Gómez, 2009.a) were based on two main arguments:

- The government did not justify that the taking had a superior benefit to the "public good" vis-à-vis the social objectives of an *ejido* rural communal land.
- The final legal document was not signed by hand by the Secretary of Transportation.

In a newspaper interview on June 10, 2009, an official of SCT stated that SCT had officially declared the expropriation decree is indeed void, that it is necessary to re-enact the decree and that the agency will re-value and re-determine the compensations to be awarded (Gómez, 2009.a). This was based on the federal court's judgment where the judge:

- awarded a Writ of *Amparo* (judicial review with individual effects) to the initial owners
- asked for the return of the lands to the *ejidatarios*
- asked the agency to re-determine the payment and compensation to be awarded to the land owners
- asked for the land to be expropriated again but paying the *new value*

SCT did indicate however, that expropriations happen less than 1% of the time because property owners are usually willing to sell. To compare this to TxDOT for example, John Campbell TxDOTs ROW Division Director noted for the past 5 fiscal years (2004–2008), the agency acquired 9,103 parcels averaging 1,820 parcels per year. In the most recent fiscal year (2008), TxDOT obtained 1,690 parcels. Of these, 1,336 were obtained by negotiation and 354 were obtained through the process of eminent domain (Campbell, 2008).

Other issues that come up with ROW included the lack of deeds associated with ejido land. It is very common that land is passed on through generations or purchased through informal agreements. Residents will sometimes ask the state for help to process the deed. This can take a long time but can be fixed. This is also an issue if the owner of the house to be acquired has died. There are also still occurrences where multiple parties all with deeds to the same property; however this is not as common.

There is no practice of landowners donating property to SCT as often occurs in the U.S. for tax purposes or to increase overall accessibility. Sources noted however, that a type of easement dubbed '*servidumbre de paso*'—does require a private land owner to cede sections of property to another private property owner if access is required to connect to a highway being built by the government. The difference here from the U.S. is that the land owner is 'obligated' to cede the property.

In terms of parceling ROW the groups responsible for this will depend upon whether the project is state or federally led. According to sources, if a project passes through several states the project is considered federal and municipalities and states are not involved in the process as they do not own any territory. SCT however, is involved in all these processes.

3.7.1 Private Sector Involvement

According to consultant groups, concessionaires have now been putting extra money into project budgets and the contract to pay out the difference in valuation (from *catastral* to a more market based price) when expropriation is either looming or a court case might be imminent. In this way the use of eminent domain can be avoided. Sources noted that this has been very helpful in cases where INDAABIN is petitioned by the landowner for another evaluation of the property. Sources noted that this helps to speed up the process, reduce litigation, and gives the

land owner a *fairer deal*. Private sector sources also noted that for the majority of projects their partner in this process is the state government. The state government creates all the paperwork associated with acquiring the ROW, notwithstanding that the law and process is dictated by federal government. Private sector sources also stated that in some instances state governments can make up the difference between the INDAABIN valuation which comprises the federal offer for ROW purchase and other valuation that have been undertaken. So there are ways to provide a more 'market-value' price to landowners.

Staffers at INDAABIN also noted that while their agency is responsible for this valuation, they contract out for the actual assessment. This is done in terms of "replacement cost," rather than market value which may be more than market cost. When purchasing property that a business owns, the real property is valued not in terms of the value of the business, but the replacement value of the fixed assets.

There are also other ways that private sector involvement can assist in providing a fairer deal for land owners. The private sector indicated that often, in parallel to INDAABIN's valuation process, they will also hire a consultant and commission a study of the zone which includes putting a value on the natural resources and improvements to the real property. This amount is then compared with INDAABIN figure and they will provide this study to the official evaluator in INDAABIN. If the difference is substantial they recommend to the client (usually the state) to request INDAABIN re-evaluate. INDAABIN has 30 days to do this. Once the revaluation takes place, negotiation with the property owners can begin. This is part of the standard procedure within INDAABIN, and is always part of the landowner's recourse, not only in terms of property, but also land.

3.8 Concluding Remarks

As has been seen in this chapter, SCT has been making many changes to the way that infrastructure is planned and placed into national planning documents like the NIP. SCT is now using more sophisticated and robust analysis and criteria development to develop feasibility and other cost-benefit studies it as it moves towards longer-term planning that will cover multiple administrations. This will have lasting impact and will change the planning dynamic in Mexico to focus on longer-term projects with multiple funding cycles. One area that may be of future concern however, is the eminent domain process, especially in regards to expropriation of *ejido* land. The next chapter highlights how the processes discussed in this chapter are being played out in the real world of infrastructure development as projects in the NIP are developed and as the states and private sector begin to become much more heavily involved in the process of planning, financing, and developing transportation infrastructure projects.

Chapter 4. Major Infrastructure Projects: Case Study Overview

This chapter provides an overview of twelve infrastructure projects that were chosen by the researchers (in consultation with the TxDOT and SCT) to showcase how transportation infrastructure modes are being developed. Many of the projects were selected from the NIP. The case studies were designed to focus on infrastructure projects considered strategically important by the Mexican government and assess how various institutions contributed to their development and any oversight.

The scope of the research approach was intentionally broad, focusing on issues such as project prioritization and selection, budgeting and finance, bidding and tendering, right-of-way acquisition, environmental assessment and mitigation, engineering/planning coordination among entities, and citizen involvement. This allowed the researchers to develop a complete picture of the planning and implementation process as it applied to different types of projects.

CTR opted to utilize the novel approach to undertaking this task: the LBJ School of Public Affairs Policy Research Project (PRP). In a PRP, a group of students selected due to their interest and expertise in key project areas, performs real world analysis on a particular topic for the benefit of a public sector sponsor. The PRP gathered information from literature reviews, interviews, websites, and site visits to the case study projects around Mexico that covered all modes: highways, rail, ports, airports, commuter rail, and inland ports. This chapter provides a summary of these case studies and comments on the impact of their development on Mexico and Texas's infrastructure.⁸

Two other smaller case studies conducted for projects that were proposed in the NIP have received widespread press coverage, and could have potential impacts to trade flows in the U.S. and Texas. The first is the port of Punta Colonet which was considered one of the flagship projects of the NIP (and would be developed from scratch) but has been delayed as a consequence of the global economic slowdown. The other is for the port of Topolobampo which is included in the NIP, but not allocated a specific development timeline. Topolobampo was also reviewed because it has been the subject of private sector promotion by the MOTRAN group out of Midland-Odessa, Texas as a new trade connector, and had received federal funding on the U.S. side⁹ to study the trade route to the U.S. At the time of writing the RFP for Punta Colonet has not been released (notwithstanding news reports announcing its imminent release). With the economic downturn it cannot be predicted with any certainty when this will be released. Topolobampo has been conducting dredging and patio building activities, but according to the Sinaloa Development Council (Rivera, 2009), the Mazatlán Durango Highway project has tied up funds that would have been released to improve the highway connections to the port, which would have then placed the port into a better position for connectivity into Mexico and a potential bid release date.

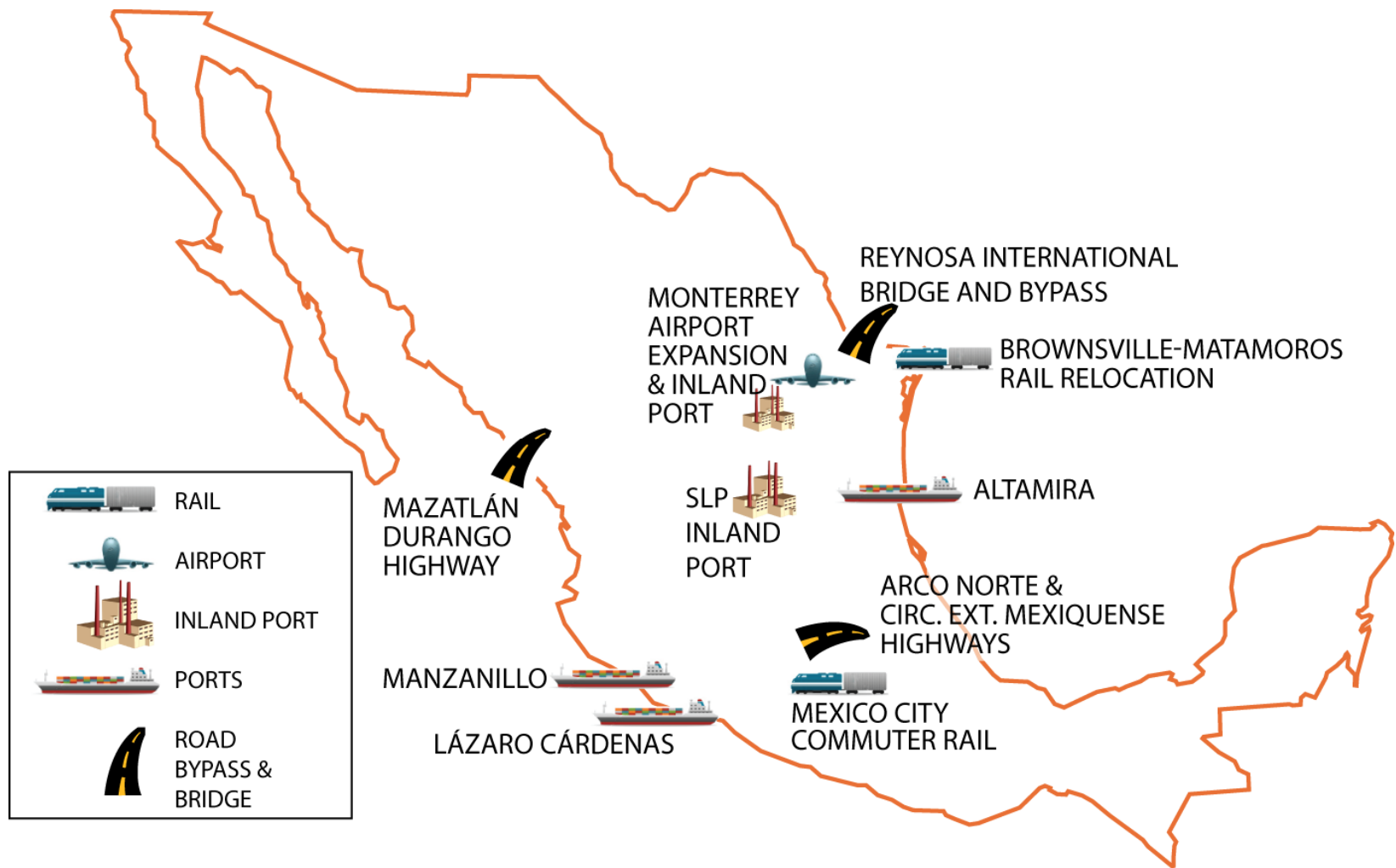
Site visits were conducted during the 3 month period from January to March 2009. Table 4.1 contains a brief description of the case studies and Figure 4.1 shows their location.

⁸ For those readers who want to review the full case study analysis it can be found in on the CD-ROM accompanying this report.

⁹ Funding was allocated in both TEA-21 and SAFETEA:LU

Table 4.1: Transportation Projects in Mexico

Project	Type	In NIP	Description
Manzanillo Zona Norte Expansion	Pacific Port	✓	Construction of second specialized container port at the Port of Manzanillo, the largest container port by volume in Mexico. Pacific coast port with direct highway access to Guadalajara.
Lázaro Cárdenas Specialized Container Terminal	Pacific Port	✓	Construction of phase two of the specialized container terminal. Eventual construction of a third phase. Pacific coast port south of Manzanillo.
Altamira Expansion	Gulf Port	✓	Gulf port focused on general/bulk cargo. Projects include a galvanized steel plant, a carbon black plant, and a new terminal for the construction of marine platforms.
San Luis Potosí Inland Port	Inland Port	✗	Expansion provides low-cost customs inspections away from maritime ports and border crossings and adds distribution capacity.
Interpuerto Monterrey	Inland Port	✗	Construction of new inland port to serve Monterrey's industrial areas. Near main highway that extends to Texas border.
Mazatlán-Durango Highway	Highway	✓	Designed to cross Sierra Madres using tunnels and bridges providing a much needed east-west corridor. One of the cornerstone projects of the NIP.
Mexico City Arco Norte	Highway	✓	146 km of toll roads and 226 km of highways to allow through cargo to bypass Mexico City.
Mexico City Circuito Exterior Mexiquense	Highway	✗	Outer loop project. Designed to relieve traffic congestion in Mexico City. Located closer to the city than <i>Arco Norte</i>
Mexico City Commuter Rail	Passenger Rail	✓	Construction of passenger/commuter railway to reduce length of commute to Mexico City. First of three planned lines.
Monterrey International Airport Expansion	Airport	✓	Construction of an additional passenger terminal. Provides new international destinations and increased capacity for airlines and passengers.
Reynosa-Anzaldúas Bridge	International Bridge for non-commercial vehicles	✓	Joint bridge project between Mexico and the U.S. from Reynosa to McAllen. Initially the bridge will serve only non-commercial vehicles, though it's anticipated to eventually open to commercial traffic.
Brownsville-Matamoros West Rail Relocation	International Railroad Bridge	✓	Relocation of rail bridge and switchyards out of the cities of Brownsville and Matamoros. Construction of the new track, switchyards and bridge.



*Figure 4.2: Map of Transportation Projects in Mexico
Case Study Overview*

As noted, the case study projects were chosen to be representative of multiple modes and regions in Mexico, as well as different funding sources and jurisdictional responsibilities. The researchers reviewed projects in the NIP, state economic development plans, as well as private sector led projects, and generated an initial list of approximately forty potential case study projects in the first year of the project. From this initial list, the researchers, SCT, and the TxDOT project panel chose twelve projects to review in-depth. This section provides a brief overview of these twelve case study projects and why they were deemed important to investigate for TxDOT.

4.1.2 Manzanillo Zona Norte Expansion

Currently, Manzanillo is the largest container port in Mexico by volume. The designated container terminal is operated by SSA Marine, a private concessionaire. API Manzanillo, the equivalent of the port authority, has developed a series of aggressive expansion plans that include a new container terminal that would double the ports existing capacity, a rail relocation to remove the rail lines from the city, and a highway and bridge project designed to separate port and local traffic. These additional projects will be accomplished with a combination of public and private funds, while the construction of the new container terminal will be completed entirely with private funds. However, there is some disagreement between the public and private sector over the scale of the projects, and a lack of agreement/coordination between the entities involved could slow progress. The port is located in the central part of the city of Manzanillo and therefore its growth is severely constrained due to lack of available land around the existing port area available for expansion. The port suffers from poor public image due to the fact that rail and road connections to the port go through the center of the city. The port is also facing backlash from environmental groups for the destruction of mangrove stands where the new terminal will be located. Notwithstanding API Manzanillo's aggressive development plans, Manzanillo still has some significant challenges—including coordination and environmental concerns—that will need to be addressed. There does not seem to be sufficient coordination between the different actors at the port to achieve such a bold expansion plan. The rail relocation plan for the port is very ambitious. While the plan involves significant funding from the public sector, funds will also be provided by Ferromex, the rail company serving the port. From researcher conversations with Ferromex, the company would prefer a less ambitious plan to ease the problems of trains passing through congested areas of the city. The current rail relocation plan involves construction of a tunnel sufficient for double stack container cars through the hillside behind the city of Manzanillo. Ferromex's share of cargo leaving the port by train has fallen in recent years in terms of percentage for several reasons outside of the problems with the at-grade crossings in the city, including slow customs processes and an indirect rail route to major Mexican cities. While Ferromex would like to handle a higher percentage of cargo leaving the port, other issues, such as the slow and unreliable customs clearance, must be addressed before the company's share of cargo is likely to increase. Until these issues can be resolved, an incremental improvement, such as crossing arms, would likely garner more support from the company than the ambitious plan API Manzanillo would like to implement. Ferromex should have been more extensively consulted in the Manzanillo project development phase to ensure private sector buy in.

While the government may choose to focus on the development of Manzanillo because of its current importance among container terminals, the heavy reliance on concessions and privatization in the Mexican port systems means that such ambitious projects are unlikely to

come to fruition without private-sector support and input. Some of the expansion plans at Manzanillo, like the rail expansion, do not seem to make much sense financially for the private sector and are therefore not realistically feasible. Additionally, scarce space will continue to remain an issue at the port—there is very little room for expansion. API Manzanillo acts as an individual entity whose best interest is to see the port expand. Given the port's severe difficulties, it may be in the best interest of the national infrastructure to focus on the development of container terminals and related infrastructure at another port, such as Lázaro Cárdenas. Since privatization, a sense of national coordination is gone from the ports, as ports compete among themselves for container traffic.

4.1.3 Lázaro Cárdenas Expansion

Lázaro Cárdenas is another Pacific Coast port with an aggressive expansion project. Like Manzanillo, Lázaro Cárdenas is overseen by API Lázaro Cárdenas with concessionaires funding and operating the various terminals. There are some significant differences between Manzanillo and Lázaro Cárdenas. The port of Lázaro Cárdenas is located outside of the city, giving the port ample room to expand. Additionally, the town's main source of economic growth is the port and therefore there is a great deal of public support. Lázaro Cárdenas is naturally deep and no dredging was necessary, and rail connections throughout Mexico and to the U.S. already exist. The greatest strength of the Lázaro Cárdenas project is coordination. Unlike Manzanillo, the various players at Lázaro Cárdenas work together and communicate to facilitate planning and operations. They conduct monthly planning meeting and weekly operations meetings. With so many stakeholders involved in planning, financing, and operations, communication and coordination is essential. There is an obvious difference in the two ports; Lázaro Cárdenas is being developed in a logical and coordinated way due to the fact that the various stakeholders are able to work together to develop it into a competitive port. The ultimate goal of Lázaro Cárdenas is to be able to compete with the overcrowded ports of Los Angeles and Long Beach thanks to its rail connectivity to the U.S. via Kansas City Southern de México's (KCSM) NAFTA rail line. Currently, there is little demand for cargo from Lázaro Cárdenas going to the U.S. However, if Lázaro Cárdenas continues to develop in a coordinated and efficient way and proves to be a quality port, it may become competitive with Los Angeles and Long Beach once those ports become too overcrowded.

4.1.4 Port of Altamira Patio Expansion

The port of Altamira is a Gulf Coast port. The port boasts high environmental and safety standards, which are good for public opinion and operations. The Port of Altamira handles multiple cargo types. The port is home to a large liquid natural gas facility, and expansion plans include the construction of a new patio to build deep water oil platforms, the construction of a new carbon plant, and the construction of an industrial plant to produce galvanized steel for the automotive industry. The expansion of Altamira is being driven by API Altamira and several private terminal investors. Each of the previously mentioned expansions will be funded by private investment, with API Altamira providing public funds for investment in general port infrastructure. Altamira also does not face the significant land constraints as the port is located outside of the town's urban area and has plenty of surrounding land. Recently, however, there was a law suit over the past acquisition of some current port lands from *ejido* groups. The port suffered a major setback when the Mexican Courts overturned the eminent domain procedure which had acquired the communal land (known as *ejido* land) 28 years earlier and required SCT

to pay compensation in the form of a large fine and reconvene this process. This case may have major ramifications for other infrastructure projects that take *ejido* land. Altamira has also experienced some connectivity challenges. Poor road conditions have resulted in connectivity gaps to the far south, central, and northwest regions. Furthermore, unreliable rail and a lack of double-stack container clearance over parts of the rail route will continue to present challenges in rail transportation. This shows the importance of intermodal coordination and planning, given that a port can be successful only if its cargo can successfully be transported to its destination

4.1.5 San Luis Potosí Inland Port

San Luis Potosí is an inland port and industrial park with an ideal location for a free trade zone as it is in the center of northern Mexico, and is located on important rail and highway corridors. This project is being privately financed with some government support given through grants and the provision of infrastructure and land. The inland port has been fortunate in having an excellent relationship and coordination with KCSM railroad. San Luis Potosí gained recognition by developing the first Free Trade Zone in Mexico. The purpose of a logistics port is to create cost-effective, provide customs inspection, and storage of international cargo. In the case of the San Luis Potosí Logistics Park and Logistik Industrial Park, there is an additional goal of relieving the burden of incoming international cargo traffic by diverting it to the inland ports facilities. Grupo Valoran and San Luis Potosí officials asserted that the vision of the San Luis Potosí Logistics Park began over 8 years ago and has benefitted from a considerable amount of coordination between the state, city, and private firms developing the project.

4.1.6 Monterrey Inland Port

Monterrey Inland Port is another inland port project being developed to take advantage of highway and rail corridors that connect Monterrey to the mega-region of Mexico City-Guadalajara and also to the U.S. The project is being financed by private funding but has the sponsorship of INVITE, the Regional Integration Program Incentive of Northeastern Mexican State, as well as SCT and the state of Nuevo León. The project has been on the state's planning agenda since the turn of the millennium and was laid out in the State Development Plan of 2004–2009. The inland port is currently in the planning process, although land has already been secured adjacent to KCSMs existing intermodal yard. INVITE and the state have created a private entity, Servicios Interpuertos, to guide its development, draw up feasibility studies, and create a business plan. The inland port is fortunate in that it is being planned at the convergence of two of Mexico's Class I railroads: KCSM and Ferromex, as well as Highway 57, which links up to IH 35 at Laredo. INVITE has also been aggressive in developing business agreements between it and other logistics hubs and signed a Memorandum of Understanding with the Allen Group's Dallas Inland Port in June 2007. However, this inland port still has a long way to go to begin operations, including the development of infrastructure, utilities, and access roads. It will also have to overcome one large hurdle—negotiating with KCSM and Ferromex regarding collaboration between these two privately held rail companies.

4.1.7 Mazatlán-Durango Highway

The Mazatlán-Durango Highway is an example of a high profile project. It is one of the cornerstones of the NIP, and includes the construction of a massive suspension bridge in the Sierra Madres. The highway is the final part of a larger transversal corridor connecting Mexico's Pacific Coast to the U.S. The corridor is termed the "Mazatlán-Matamoros" corridor and extends

from the port of Mazatlán through Torreón, Saltillo, and Monterrey to the border with Texas. The project is very ambitious due to the difficulty of crossing the Sierra Madres. While there is currently a road connecting Mazatlán and Durango, this project will significantly shorten travel time. The project is indicative of the push to develop Mexico's east-west corridors, which have historically been underfunded, as infrastructure development focused on roads to and from Mexico City. The national government has been the major driver in this project, with input from the states of Sinaloa and Durango. The project is deemed as so important that it has been placed in front of other transversal corridors across the Northwest, and has diverted funds and attention from road development to and from the port of Topolobampo. This project is sponsored by the federal government with input from the states of Sinaloa and Durango. The project was found not to be suitable for a concession, but the highway was nonetheless funded in part by private money in the form of profits from the re-concession of other roads. Funds from the FARAC I concession package are being used to build the road, and the project financing is an example of how Mexico is seeking to insulate its infrastructure funding from the current dependence of the federal government on PEMEX by leveraging older infrastructure investments into capital for new roads through re-concession packages. Mexico is in a fundamentally different place in its infrastructure development from the U.S. While the U.S. is working to maintain its existing system, Mexico is still working to connect the major urban and manufacturing centers in the country. A connection from Monterrey to the West coast, which the Mazatlán-Durango Highway will provide, is a key step in Mexico's process of building a highway transportation network capable of supporting growing international trade.

4.1.8 Arco Norte Highway

Arco Norte is a 223 km(138.6 miles) highway connecting federal and state highways in the northern half of Mexico City's metropolitan zone. This project intends to significantly reduce congestion and pollution and will decrease travel time from 4 hours to 1.5 hours. This project is a PPP between SCT and Autopista Arco Norte (the concessionaire). Although the need existed in 1990s, the project was not developed until the option of creating a PPP provided an alternative to federally financed projects. The planning and feasibility studies for this project were conducted in a similar fashion to U.S. feasibility and traffic and revenue studies (T&R). The cost-benefit analysis took into account user benefits such as time savings and vehicle operating costs. The feasibility studies predicted future social benefits, as well as potential financial gains. Additionally, Cal y Mayor, who conducted the feasibility study, recommended that 76% of the road be constructed as a 4-lane instead of 2-lane highway. The most notable challenge to Arco Norte was obtaining the right-of-way. The right-of-way acquisition was originally predicted to be \$104 million. However, due to the size and nature of the project, SCT didn't get all the acquisitions before the project began, and as a result, the concessionaire was forced to pay additional compensation. Furthermore, sections of the road go through urban areas with many small properties that complicate and delay the right-of-way procedure. The private sector reflected that in most cases, it would have saved SCT time and money to change the route in order to avoid densely populated areas, although doing so would have decreased the benefit of Arco Norte as an economic development engine for some communities. Arco Norte was financed through a PPP, with SCT constructing a portion of the road using public financing and the concessionaire constructing the majority of the road. The concessionaire was chosen through an open-bidding process. SCT looked at the technical and economic aspects of the bidders and chose the bidder that requested the least amount of federal money to finance the project. The

concession includes the construction of 146 km(90.1 miles) of toll road and the operation and maintenance of the entire 226 km(140.4 miles) highway (including the 77.6 km(48.2 miles) constructed by SCT).

4.1.9 Circuito Exterior Mexiquense Highway

Circuito Exterior Mexiquense highway is a 95 mile (152.8 km) highway east of Mexico City running north/south that will connect four major highways around Mexico City and alleviate the need to enter into the city to travel between these highways (two loops will connect these major highways). Circuito Exterior Mexiquense will provide similar benefits to Arco Norte in terms of time savings and air quality benefits. The project is groundbreaking in that it is not being developed by SCT, but by the State of Mexico and the Federal District utilizing a PPP process. The project is contained in the Economic Development Plan 2005-2011 for the State of Mexico. It is being developed in four stages and the first three of these were estimated at MXP\$6,628 million, of which 40% of the financing came from OHL (the concessionaire), and the remaining 60% from a syndicate made up of BANOBRAS, the official Credit Institute of Spain (ICO), and BBVA-Bancomer. In November 2008, the project was refinanced to obtain capital development funding for Phases II and III. Cal y Mayor (the consultant for Arco Norte) produced feasibility and T&R studies for this project. Of the 140,000 vehicles circulating everyday in the area, 100,408 were estimated to use Phase I in 2006. During the first 3 years of operations for Phase I, usage surpassed these estimations. Phase IV of this project is currently on hold because the initial T&R studies were not positive and the concessionaire is waiting to see how other planned projects that are being developed in this area will affect potential users.

4.1.10 Mexico City Commuter Rail

Mexico City commuter rail links Mexico City to municipalities in neighboring Mexico states. It is the first commuter rail project to be developed using a PPP process in Mexico. The project is utilizing existing tracks, which were originally built in the late 1800s, fell into disrepair, and were sold-off as part of the privatization process of the Mexican National Railways in 1994. The commuter rail project is in the NIP, and is being developed in three stages. The project is also very unusual because it has had the cooperation of three levels of government (federal, federal district [which is similar to Washington D.C.], and state) who signed multiple development and coordination agreements. Line 1, opened in 2008 and was developed by a Spanish concessionaire. The financing of this project was divided into two parts: private and public. The federal government paid for pedestrian crossings and right-of-way separation of the rail tracks. The private concessionaire paid for the rehabilitation of track, signaling, developing the stations, and supplying the trains. Two trust funds were also created for the development of Line 1. The first was established by the concessionaire for warranty, administration, and payment, also included the publically subsidized railway works. The second trust fund is a contingency fund set up to back up the partial payment of concession debt. There are two more lines to be built and opened for the commuter rail; the tenders for these lines were issued during 2008, but currently they have been suspended. Thus far, Line 1 has been a success with ridership numbers exceeding expectations and the concessionaire already preparing to extend the route within the five-year time frame that the contract outlined. Notably, both the concessionaire and SCT commented that, given another opportunity, they would involve all interested parties earlier, particularly companies such as bus operators and private transit groups. There has been one setback for Line 1: in April 2009 two trains collided, resulting in 109

injuries. This accident was allegedly caused by human error. The impact of this accident on ridership numbers is not yet clear and it will be some time before the findings of two investigations being undertaken by the concessionaire and the Mexican Attorney General are released.

4.1.11 Monterrey International Airport Terminal B Expansion

The Terminal B expansion at the General Mariano Escobedo International Airport in Monterrey, Mexico will provide the airport with additional passenger capacity. The airport serves the major metropolitan area of Monterrey, and will facilitate the movement of people to and from the city. Without expansion, General Mariano Escobedo International Airport cannot accommodate new airlines, even if they do not want to house their administration units inside of the airport itself. The airport is also developing its cargo terminal, Terminal C, which will facilitate the movement of air cargo to the region. The project is privately funded by a consortium directed by *Grupo Aeroportuario del Centro Norte* and follows expansion of Terminal A. These private investors have invested around MXP\$700 million to date, which is about US\$47 million (González González, 2009). It should be noted that this expansion is not a part of the NIP introduced by President Calderón in 2007. When the expansion is complete, the General Mariano Escobedo International Airport will be one of the largest in Latin America. One notable feature is the Terminal B project and the terminal's use of environmentally friendly building techniques and the use of locally sourced materials. The Monterrey airport expansion will have an important impact on relations between Texas and Mexico. Terminal B will create new routes to the U.S., allowing more incoming and outgoing business flights. In addition, the new cargo terminal will allow increased cooperation between manufacturing and assembling companies in both countries. The development of Terminal C's cargo operation will play a large role in the future of the airport. The use of multinational corporations like Fed Ex will allow seamless integration of importers and exporters in both countries. Moreover, the airport expansion will bring in tourists from across the world, including the United States that want to explore the city of Monterrey. The overall impact to Texas from the expansion will come in the form of increased opportunities to integrate between the two regions.

4.1.12 Reynosa-Anzaldúas International Bridge

The Reynosa-Anzaldúas Bridge is a joint project between Mexico and the U.S. as outlined by a Presidential Permit signed by both sides in 1999. On the U.S. side, the bridge is a partnership between McAllen, Hidalgo, Mission, the Texas Department of Transportation, and the federal government. On the Mexican side, it is a partnership between the state of Tamaulipas, the federal government, and the concessionaire Grupo Marhnos. Once construction is complete, the Reynosa-Anzaldúas Bridge will ease congestion of commuter traffic on two neighboring bridges. On the Mexican side of the bridge, the concessionaire, Grupo Marhnos, is responsible for the entire implementation, including access roads, port, and bridge. They have been able to keep the project on schedule and within budget, and as they are responsible for the entire project, they have not had to wait for other contractors to complete their work for them to be able to conduct theirs. One of the key points stressed by SCT was that they would like to coordinate more closely with the American side on future projects. They also stated that there should be a greater exchange of technology and ideas between both countries. The biggest drawback mentioned for this project was with respect to the Executive Plan conducted by the state of Tamaulipas, which was outdated and contained several errors that increased construction costs.

4.1.13 Brownsville-Matamoros Freight Rail Relocation Project

The Brownsville-Matamoros West Rail Relocation project (BMWRR) will move a heavily trafficked rail line outside of city centers to reduce traffic congestion and noise, as well as improve safety and environmental conditions. The motivation behind this project was almost entirely a response to negative public opinion regarding the railway running through the major cities, and has little economic benefit. This project provides insight into international projects and border coordination. Local, state, and federal governments in both the U.S. and Mexico, international commissions, and private entities are all involved in this project and therefore a great deal of coordination is necessary. There are multiple bridge projects along the Texas-Mexico border currently in the planning stage or already under construction. The BMWRR project is nearing completion and can be used as a model and be highly beneficial for planners. The challenge of a project such as the BMWRR is coordination between various players. Brownsville-Matamoros has been successful in the coordination at the public level. There are two project sponsors, one representing Cameron County and one representing the state of Tamaulipas, as well as an overall project manager coordinating all details. The project sponsors coordinate well with the cities of Brownsville and Matamoros, as well as with the state of Texas and SCT Mexico. There are monthly meetings that are jointly led by the two project managers and include all players in the project. However, there has been concern that the private players involved, such as the rail (KCSM), the current bridge operator (B&M Bridge Company), and the port of Brownsville have been left out of the planning process. The lesson learned from this project is that planning and implementation can be hindered without involvement and coordination of all crucial players, including both the private and public sector.

4.2 Key Case Study Findings

4.2.1 Financing & Public Private Partnerships

The federal government maintains a strong and in many cases dominant role, yet it is clear that infrastructure planning under the Calderón administration is moving in the direction of joint action and responsibility. The Mexican government has increased private sector participation in the provision, operation, and maintenance of transportation facilities. The NIP goes much further in solidifying and quantifying the role of private and non-federal participants in advancing broad development goals and providing attempts to develop different transportation modes within the greater concept of a transportation system, integrating port development, highway connectivity, and rail projects into one multimodal plan. This trend toward thinking of the various modes as part of a system was evident in several of the case studies where projects were being constructed with other complementary infrastructure developments in mind. For example, the Lázaro Cárdenas container terminal being developed in concert with improvements to the Kansas City Southern de México (KCSM) double stack rail connection to Mexico City and other points north. Lázaro Cárdenas is one example of a project where consultation and cooperation with the private sector has yielded good results. At the port, KCSM, API Lázaro Cárdenas, and Hutchinson Port Holdings (a private Chinese company, granted the 2003 concession for the first phase of the container terminal) meet regularly to discuss planning and operations. This public and private sector cooperation has led to growth and investment acceptable to the private sector and in line with their business models. Indeed KCSM's investments in the NAFTA rail line are driving much of the development at the port by providing viable rail connectivity to central Mexico and the U.S.

4.2.2 Coordination

Several projects included in this study exemplify the necessity of coordination among various players in both the public and private sector. Projects in this study include cross-border coordination between the U.S. and Mexico as well as coordination among public entities, private concessionaires, and various modes of transportation such as rail and road. It is obvious that project success is often directly linked to the openness and coordination between various players. Projects that maintain open communication and collaboration throughout the planning and implementation process face fewer difficulties and roadblocks. The most complex and in some ways successful coordination project has been the Mexico City Commuter Rail, which required eleven collaboration agreements between the multiple parties that were involved with the project. These were signed over a period of 6 years (the first was signed on June 11, 2003) failure in any one of these agreements could have derailed the entire project. This also highlights that public officials are cognizant of the importance of many of these projects and are willing to make the necessary concessions that may be required to bring them to fruition.

The port of Topolobampo is an example of a project that has been slowed because of lack of private sector support. The port lacks sufficient rail or road connections to the interior to develop as a major port gateway for the country, but thus far private companies have not shown significant interest, especially on the rail side, because of difficulties with terrain between Topolobampo and interior Mexico, namely the difficulties in rail trackage through Copper Canyon. Better connectivity will have to be established if the port project is to move forward, which will likely require private sector involvement.

4.2.3 Environment and Right-of-Way

Many of the projects in this study encountered environmental challenges along the way. However, the projects were able to pass the environmental review with enough support behind the project. International organizations are increasingly getting involved in Mexico's environmental process. This may lead to more stringent environmental reviews in the future. The timing of the environmental review before ROW has been acquired may also be problematic for TxDOT and U.S. parties who are collaborating on projects. Because projects in Mexico can be initiated before ROW is acquired, unforeseen costs and change orders can result. In the case of the Reynosa Anzaldúas Bridge, this led to unanticipated costs associated with alignment of an access road that was not in the initial design (and connects to Monterrey, the third-largest city in Mexico) and also the misalignment of the roadway and a port facility building. Also the environmental and ROW processes in the two countries are reversed. In Mexico ROW is acquired before the environmental process is complete. If there is a difficulty with the environmental review this can force SCT to acquire new right-of-way, as was the case with Arco Norte.

4.2.4 Public Outreach/Involvement

Finally, it should be noted that public outreach and involvement can be hit-and-miss. For some projects—for example, Lázaro Cárdenas, Mazatlán-Durango Highway, and the Mexico City Commuter Rail—the public has been exceptionally supportive and the projects are proving to be able to generate income for their regions and public good will. In other some instances, the lack of public support may provide the critical fulcrum point at which the projects may become politically problematic. The port of Manzanillo, for example, will be a problematic project

because of both environmental and public distrust issues. Similarly, the news about the *ejido* land that was expropriated for the port of Altamira came back in June 2009—26-years after the expropriation—to haunt the parties involved, especially SCT, regarding the legality of this eminent domain process.

4.3 Concluding Remarks

This chapter gave an overview of transportation projects that are in the NIP, as well as projects that are being promoted and developed by states and the private sector. Mexico is relying heavily on private-sector involvement for project development and thus far, it seems that Mexico has managed to integrate successfully the use of PPPs and private sector finance to underpin its national program. Based on this case study work, the next chapter of this report will review some of the differences between Mexican and U.S. transportation planning.

Chapter 5. Differences between U.S., Texas and Mexico Transportation Infrastructure Plans & Programs

The research reviewed and compared federal transportation infrastructure programs as well as the state transportation infrastructure programs and private sector initiatives in the states bordering Texas— Chihuahua, Coahuila, Nuevo León, and Tamaulipas. The goal behind this was to discern the similarities and differences between these plans and identify what were termed discontinuities in plans and programs in the Mexican border states that did not align with Texas planning efforts. The research team also reviewed and recommended future border planning and coordination changes. As will be discussed in this chapter, it is important to consider the overall infrastructure network and how these interlinked for trade. This is especially true in Mexico, where there is a comprehensive NIP focused on completion of corridors vital to the country's competitiveness, including the development of corridors to increase trade and internal freight movements. For that reason, the case studies in Chapter Four focused on projects across modes in various geographic locations, including the border region, to gain an understanding of the interconnections between modes in Mexico. Over the course of the research the researchers identified several differences and discontinuities between the U.S. and Mexican infrastructure planning processes beyond just border planning initiatives.

5.1 Overview

The significant differences identified fell in to four sub-categories and are discussed throughout this chapter. Section 5.2 discusses how the U.S. and Mexico's transportation networks are at different stages in their life cycles which impact planning, construction and maintenance revenues, and projects. Section 5.3 of this chapter discusses differences in the funding and finance process, as well as current fiscal issues in the underlying transportation finance systems. Section 5.4 discusses governance discontinuities regarding the decision-making authority for infrastructure projects and how those designated parties are treated on each side of the border. This section includes a discussion of the various entities on each side of the border responsible for infrastructure planning and how the two systems are different. Section 5.5 focuses on process discontinuities, i.e. differences in how infrastructure projects are created. This section focuses on the process of infrastructure construction—from the early planning stages to implementation—and how infrastructure projects progress in their respective countries. A final section discusses security initiatives that are being implemented as a consequence of drug violence and weapons smuggling and may impact infrastructure as bottlenecks occur at border crossings.

5.2 Network Lifecycles

The fundamental difference between the planning processes of the two countries is that they are in different stages of their network lifecycles. The year 2006, marked the 50th anniversary of the Federal Aid Highway Act of 1956 that led to the creation of the U.S. Interstate Highway System. The backbone of the system, 46,508-miles of superhighways, has had a profound effect on the U.S. economy and the very makeup of the country (NCHRP, 2006). The U.S. now enjoys connectivity via roadway to all regions. These roads interact with a complex system of railway networks, airports, and seaports to form an advanced infrastructure network. Consequently, the U.S. must dedicate an increasing share of its total budget to the maintenance

of this system, which is now 50 years old. TxDOT commissioned a committee in 2008 to provide an authoritative assessment of the state's transportation infrastructure and mobility needs from 2009–2030: focusing on pavement maintenance and rehabilitation, bridge maintenance and reconstruction, and congestion (2030 Committee, 2009). Known as the 2030 Committee, it found that maintenance and rehabilitation of the existing system to keep pavement in a 90% good or better condition would cost US\$77 billion¹⁰ over the 22-year analysis period¹¹. Bridge replacement, maintenance and inspection costs came in at US\$36.1 billion for the 22 year period (2030 Committee, 2009). Most of the planning and construction currently being undertaken in the U.S. is to relieve congestion on established corridors, facilitate freight transfer, and further integrate modes. While the U.S. continues to upgrade and add to existing corridors, it has long since completed the effort to interconnect communities. In Mexico, this effort is still ongoing

Mexico is still largely focused on joining segments of infrastructure, much the same way as the U.S. was when the interstate highway system was being completed. Mexico's current infrastructure system has Mexico City as its center, with various spokes leading off from there. There are few transversal corridors in the country, often necessitating travel into Mexico City to cross from the Gulf to the Pacific. Consequently there is a great focus on building east-west corridors to connect the various centers of industry in the country, ease the flow of goods, and increase international competitiveness. Figures B.1 and B.2 in the appendix show the planned highway improvements, and illustrate the emphasis on finishing the country's corridors. There is also a focus on providing paved roads to rural, isolated areas of Mexico to integrate sectors of society that previously were not connected to the overall economic system. This is particularly true of the road projects in the southeastern and northwestern regions of the country. There is recognition in Mexico that lack of investment in infrastructure has held the country back in relation to other developing nations.

All infrastructure planning efforts between Texas and Mexico begin with the recognition of this fundamental difference between the two systems. It is important to understanding some of the differences between planning and financing the two systems, especially the reliance on the PPPs for infrastructure development in Mexico, and the focus of the NIP.

5.3 Finance

Another discontinuity between the U.S. and Mexico's transportation infrastructure planning is how projects are financed and the main sources of funding for projects. The two funding systems are significantly different and both are facing difficulties as Mexico seeks to expand and the U.S. seeks to maintain their respective infrastructure systems. In both the U.S. and Mexico, budgetary constraints impede the ability to fund infrastructure and maintenance solely from federal/state revenues and other ancillary taxes and fees. This has led in both countries to the utilization of PPPs for new construction.

5.3.1 Infrastructure Funding in the U.S.

In the U.S., most of the funding for transportation projects is allocated at the federal and state levels, while the majority of planning occurs at the regional or local level. Congress authorizes funds for multi-year transportation projects through legislation—currently Safe,

¹⁰In constant 2008 dollars

¹¹Maintenance and rehabilitation for an 87% good or better pavement condition came in at US\$73 billion, and for an 80% good or better scenario at US\$64 billion.

Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Congress then appropriates the funds as part of its budgetary process. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) are then responsible for dividing the funds among the state Departments of Transportation (DOTs). The states set the funding priorities and a general outline of the infrastructure plan for the state, and use these to apportion the monies to smaller districts (JWC, 2004) which they then match at a 20% rate with state and local funds.

A significant source of U.S. funding for infrastructure comes from the gas tax. Americans pay 18.4 cents per gallon of gasoline they buy in federal taxes, and an additional 29 cents on average in state and local taxes. The federal gas tax was last raised in 1991, and in Texas, the state gas tax was last raised in 1993 to 20 cents and its purchasing power has been eroding over time due to inflationary effects. Revenues from the federal tax go into the Highway Trust Fund (HTF), the federal government's primary means of funding transportation infrastructure projects. The rising cost of fuel over the past few years has meant that Americans are driving less and purchasing more fuel efficient cars, leading to a decrease in government revenues from the gas tax and insufficient funds in the HTF (DOT, 2009). The HTF account balance reached a critical level in 2008 and required an \$8 billion injection of capital from the general fund of the Treasury. With actual account receipts lower than anticipated, the HTF reached critical levels again in the summer of 2009 and President Obama authorized another injection of capital into the HTF in August 2009. The Government Accountability Office (GAO) estimated the fund will require \$15 billion to keep it afloat through the end of fiscal year 2010 (GAO, 2009). The U.S. has been consistently underfunding infrastructure for the last several decades and drawing on highway funds to pay for education, the wars in Iraq and Afghanistan, and reconstruction after Hurricanes Katrina and Rita (TxDOT, 2007).

The states collect gasoline taxes as well, which are added to this blended mix, but are also suffering from the same main issue as the federal gasoline tax: inflation erosion. Over the years U.S. states have developed many toll roads. Turnpike Authorities and County Toll Road Authorities can be found throughout the U.S. operating toll route systems. These have utilized bonds to fund the system, paid back through the user fees. The states have also utilized other innovative mechanisms to fund infrastructure including local option taxes and the use of bonding for infrastructure. Texas, for example has also been utilizing a mechanism called 'pass-through-tolling' where the DOT, a municipality or county, or a private sponsor can develop a project and then receive a reimbursement based on usage. This has been a very popular program (Persad et al, 2009). However, during 2009 TxDOT put new pass through tolling projects on a temporary hold as it had reached the point at which it could no longer secure the repayments to localities from proposed future gas tax revenues based on new financial projections (TxDOT, 2009).

The U.S. now sits at a crossroads from a transportation funding policy perspective—stay with the status quo or reinvent the wheel. As the 2030 Committee found in Texas in 2009, the maintenance cost requirements for bridges and pavements alone are staggering. While most transportation policy experts will freely admit that the U.S. needs an overhaul of its funding system in order to provide the funding needed to repair its existing network, much less keep pace with its growth needs (Rascoe, 2009) the solutions to attain this are far from easy. Some argue that what the U.S. really needs to do is raise the gas tax to keep up with inflation. However, this has been politically unpopular due to the recession and the rising cost of gasoline. While PPPs have been developed these are not appropriate for all projects and will not provide the panacea to set infrastructure back onto a fully funded track. Other groups also argue that the transportation

funding bills are part of the problem, setting no fixed goals and creating silos of money and requiring no analysis of performance metrics to ascertain if the programs created under the transportation bills are effective.

5.3.2 Public Private Partnerships in the U.S.

The U.S. has also been using PPPs over the past 10 years to fund infrastructure needs. Toll roads can be found in over 30 states. At the PPP zenith in the past 10 years, the City of Chicago leased its toll road in 2005 to the private sector for 50 years and the state of Indiana followed by leasing its toll road to the private-sector in 2007.

Texas has developed new toll roads in the Houston, Austin, and Dallas-Fort Worth areas over the past 7 years. These have been developed as traditional PPPs and as BOT type projects. Regional Mobility Authorities (RMAs) are also authorized under Texas law to develop toll roads. Currently there are seven RMAs in Texas, two of these have already developed toll projects which are operating in Tyler and Austin, and four others are in the processes of planning new routes and systems.

However, Texas has seen a backlash against PPPs over the past 5 years. The most notable backlash came against the Trans Texas Corridor (TTC). The TTC was a plan announced by Texas Governor Perry in 2002 for the coordinated development of over 4000 miles of separated multimodal corridors. The plan called for roughly \$175 billion in spending over the next 50 years. It was intended to be constructed using mainly PPPs, with the private sector footing the bill for much of the project (Lindenberger, 2009).

Initially the project had support, including the alternative funding measures. In 2001 and 2003 the Texas Legislature passed legislation allowing TxDOT to finance projects, including those related to the TTC, using the CDA PPP process (Woodall, no date). However, the plan met with significant opposition in the state. The ROW needed for the original plan would have been up to 1,200 feet in width in some locations (Austin Business Journal, 2009). Rural land owners expressed strong opposition to the road, which would have taken a number of acres of private land (Lindenberger, 2009). There was also significant public backlash against the heavy reliance on the private sector to build the various projects. Public distrust of private corporations, and public anger at charges for roadways were two issues voiced at a series of public meetings on the project. This led to TxDOT officially abandoning the TTC in January of 2009, to focus on the development of several regional projects (Lindenberger, 2009), and an announcement in October 2009 that it was recommending the 'no-build' option in the EIA to the Federal Highway Administration for the IH-35 segments between Dallas and San Antonio (Wear, 2009).

The TTC is an example of the discontinuity that exists between Mexico's view of PPPs, and how PPPs have been viewed here in Texas by some segments of the citizenry and legislature. In Mexico there is significantly more reliance on PPPs to build roads, and it has not yet met with the virulent opposition that the PPPs have met in the U.S. It also again highlights that just because a project is heavily promoted by one group or entity it may not come to fruition and that both sides of the border should carefully review proposed projects to ascertain the public perception.

5.3.3 Infrastructure Funding in Mexico

As discussed in Chapter Two Mexico has a federally centered system in which much of the funding for infrastructure projects comes from the general revenue fund. The general revenue fund relies heavily on income taxes and taxes levied on PEMEX profits. Mexican states and

localities have very few mechanisms for tax collection, and are dependent on disbursements from the federal government.

This federally centered system of funding infrastructure projects is beginning to change as Mexico implements decentralization policies, but the process has been slow. As Chapter Four highlighted, individual states are beginning to explore new ways of funding their own transportation projects, including state sponsored PPPs, as can be seen in the case of the Circuito Mexiquense project. In other instances the private sector is developing multi-modal projects, such as the inland port developments in San Luis Potosí. States are also assisting the private sector in the development of inland ports, through donation of land and utility services, and, by creating quasi-governmental entities to guide their development.

5.3.4 Public Private Partnerships

Mexico's first attempt at PPPs was unsuccessful and led to a government effort to rescue private toll road companies in August 1997. Ultimately, the public sector bought back many of the roads and Mexico established FARAC, to acquire the assets and the liabilities of the toll companies. After this initial failure, Mexico revisited their plan for PPPs because SCT only receives about half of the necessary funds for construction and maintenance of roads in its budget each year. The government now uses two models for public-private investment in roads- Assets Proceeds and PPP model. The PPP model takes into account a company's technical, economic, and legal readiness for the project, and all bids require traffic and revenue studies. Cost overruns are the responsibility of the concessionaire, unless the change is required by SCT, in which case it is reimbursed. To avoid some of the problems with the first round of PPPs, ROW is secured by SCT before the bids are awarded. There is also more foreign investment, and companies winning bids are often a consortium of Mexican and international companies (Engle, 2009, PPPs for Highways, 2007).

Under the PPP regulation set in the Law of Roads, the government can grant highway concessions for a maximum of 30 years. Typically, terms are from 15 to 30 years. The concession is awarded to the company that requests the least amount of public funds (when public funds are to be used) or that best meets the technical requirements of the project and offers the largest monetary amount to SCT (when public funds are not to be used). Most of the contracts issued are design, finance, build, maintain, and operate concessions, rather than just design and build contracts that were offered previously. Typically, even with the former of these arrangements, SCT does provide some specifications for the design of the project, but concessionaires are allowed to offer alternatives during the bidding process.

Mexico has also seen a heavy reliance on PPPs in the past few years, due in part to the recognized need for increased investment in infrastructure beyond what can be provided by the general revenue fund. Over the past decade the country has had a poor track record of private investment in infrastructure projects, with private investment coming to only 0.8% of GDP compared with a regional average of 1.8% (Hausmann, 2009).

The NIP relies on a combination of funding mechanisms including federal funding (from general revenue), some state funding, and a heavy reliance on private sector funding. Of the projects in the NIP, 42% are expected to be funded with public moneys, and 58% with private investment. Mexico is also seeking to insulate infrastructure funding from the current economic crisis through its national infrastructure fund FONADIN, which is infused with capital from the concession held by FARAC. FARAC funds are also being used for ongoing construction projects. For example, in the case of the Mazatlán Durango highway, it was deemed to be not

suitable for concession but still vital to national infrastructure, as it provides a much needed east-west corridor, so funds from the FARAC I concession were used to build the road, though the road remains publicly owned.

5.4 Governance

5.4.1 Multiple responsible entities

Another identified discontinuity is the number of players involved in transportation planning on each side of the border. In the U.S. and Mexico, multiple entities have jurisdiction over infrastructure projects, often creating confusion, but as Mexico is centrally led there are usually less stakeholders and entities involved in transportation projects.

On the U.S. side in Texas it is not uncommon to have a Metropolitan Planning Organization, a Regional Mobility Authority, a TxDOT District office, TxDOT head office, local politicians, and city and county planning departments all involved in one project. There are also agencies involved at the federal level, either in the approval of a presidential permit, environmental review, or in some aspect of the funding. Table 5.1 shows the responsible entities on the U.S. and Mexican sides for the Brownsville/Matamoros rail relocation, plus responsible intergovernmental organizations. As can be seen, there are even more entities involved for this border project, including the private sector.

Table 5.1: Public and Private Sector Players in West Rail Relocation

Government, Private, and International Players in Relocation		
United States	Mexico	International
<p><i>Sponsor:</i> Cameron County</p> <ul style="list-style-type: none"> • City of Brownsville • TxDOT • TxDOT Pharr District • U.S. DOT • U.S. State Department • UP Railroad • Brownsville Rio Grande International Railroad • U.S. Environmental Protection Agency • U.S. Fish and Wildlife Service • Texas Commission for Environmental Quality • Texas Parks and Wildlife Department 	<p><i>Sponsor:</i> State of Tamaulipas</p> <ul style="list-style-type: none"> • City of Matamoros • SCT • SRE • SEMARNAT • INDAABIN • KCSM 	<ul style="list-style-type: none"> • Border Environment Cooperation Commission • International Border and Water Commission • Bi-national Group on International Bridges and Crossings

Source: IBWC Presentation, Sepúlveda Interview, SCT interview, Chronica de Hoy

In some ways Mexico has a simpler system with a fewer agencies tasked with building major infrastructure projects, especially interstate highways. The federally centered government means that SCT is the lead on a project, overseeing all aspects necessary for construction, including funding and any concessions that may be awarded. However, as Mexico moves toward

decentralization, states are increasingly playing a role in infrastructure planning, even taking the lead on some projects, as was the case with Circuito Exterior Mexiquense. Circuito Exterior Mexiquense is not part of the NIP, but is part of the Program for Improving the Road Infrastructure of the State of Mexico contained in the Economic Development Plan of the State of Mexico 2005–2011. In this case SAASCAEM, part of the State Department of Transportation, oversaw development of the project, with input from the concessionaire, who was responsible for financing and building the road.

Another potential example of a cross-border discontinuity arises from multiple entities involved in the planned rail relocations along the border. As border populations continue to grow, at-grade crossings and trains passing through urban areas have become a serious concern. Cities have acted by implementing ordinances banning rail passage through towns during the day, as is the case in Ciudad Juárez. These ordinances while improving safety, slow goods movement across the border. These issues have led to the need for rail relocations, a lengthy process that takes cooperation—including cross-border planning—from many players, including private sector companies, which own the ROW and rail yards to be relocated

This was part of the justification for Kansas City Southern (KCS) promoting a rail bridge and a site for the new bridge in Laredo (known as the Laredo V Bridge), because it would remove KCS and KCSMs tracks from downtown Laredo and Nuevo Laredo. The feasibility study selected a site that was the farthest from the urban centers of both towns. Currently there are rail relocation plans for El Paso/Juárez, Brownsville/Matamoros, and McAllen/Hidalgo. The West Rail Relocation Project in Brownsville/Matamoros discussed in Chapter Four has been in the planning process for over 10 years and has multiple parties involved in its negotiation (Figure 5.1). Though the project is in the advanced stages of planning, there is potential for one of the railroads to veto the move if it does not agree on the plan or refuses to swap ROW.

5.4.2 Private Sector Financing

The private sector has been involved in the U.S. for construction of many projects and for maintenance and other activities that the DOT requires, for example the private sector is often utilized to develop feasibility studies, environmental reviews, and other studies. However, in the U.S., especially in Texas, the PPP model and long term private sector involvement in Design-Build-Operate-Transfer concessions (called Comprehensive Development Agreements—CDAs—in Texas) received criticism from the public over the past few years. A large anti-toll coalition developed in the Austin-San Antonio area.¹² During the 80th Texas Legislative session in 2007 the Legislature placed a ban on the use of CDAs for 2 years, and during the 81st Texas Legislative session in 2009, CDA authority was repealed.

As was noted earlier in this chapter, both the U.S. and Mexico are facing budget crunches vis-à-vis traditional highway financing mechanisms, so the mismatch between reliance on PPPs versus traditional funding between Texas and Mexico for example, could lead to three potential discontinuity outcomes:

1. Mismatch of funding availability or scheduling for projects
2. Overreliance by one jurisdiction/agency and private sector group on plans promoted by another jurisdiction or agency

¹² There are multiple toll projects that have been existence for many years in the Houston and Dallas areas led by the Harris County Toll Road Authority and the North Texas Tollroad Authority – both government owned entities.

3. Misjudgment on the viability of projects

A mismatch of funding availability—especially for border projects—can lead to one side completing a project earlier than the other and trigger liquidated damages. The Anzaldúas Bridge case study reviewed in Chapter Four was built with public sector funds on the U.S. side, but with private funding on the Mexican side, which sped up the development process and led to this side being completed earlier than the U.S. side. As a consequence SCT will have to pay the private sector a form of liquidated damages for the ‘non-opening’ of the bridge.

An example of misjudgment on project viability can be seen if the private sector misjudges the political and financial situation leading to white elephant projects that are not effectively linked into the networks on both sides of the border.¹³

An example of a white elephant project can be seen here in Texas with the Camino Colombia Toll Road, 22 miles east to IH-35 north of Laredo, which opened in October of 2000. The toll road was the first investor-financed toll road in the state of Texas and the third in the U.S. At the time of construction the state of Nuevo León had just completed an upgrade of the highway between Columbia and La Gloria to a four-lane divided highway linking the border to TX 85, which goes south to Monterrey. The project was intended to link IH-35 and the Solidarity Bridge, bypassing downtown Laredo, and removing the need for trucks wishing to access the Solidarity Bridge to go south on IH-35 into Laredo before turning north again (Toll Road News, March 1997).

Investors were planning to take advantage of the implementation of the NAFTA agreement that would allow through-trucking between the U.S. and Mexico, and the increased traffic at the border it was expected to generate. However, the cross-border trucking initiatives were never implemented and the drayage trucks continued to use the old bridge in Laredo because it was closer to the customs agents and yards. The Camino Colombia toll road was underutilized. The \$16 fee attracted less than 100 rigs per day compared to 1,500 per day in the T&R forecast by URS. Toll revenues were about \$0.5 million a year, significantly lower than the projected \$9 million a year, barely covering operating costs.

Three other events also severely impacted Camino Colombia’s financing. TxDOT implemented additional highway improvement projects in Laredo—specifically widening of IH-35—to ease congestion in and around the city. Also, most importantly, at this time, Bridge IV in Laredo was opened. This changed the traffic forecast for the Colombia-bridge.¹⁴ Finally, improvements on the Mexican side of the network to connect Camino Colombia to the main highway to Monterrey did not materialize as quickly as expected, which meant the connection on the Mexican side did not offer the trucking industry a faster or better ride-quality route.

With traffic on the road so low, investors were not able to cover the debt and the tollway went into bankruptcy. It was sold for \$12 million in a bankruptcy sale at the Laredo Court House on January 6, 2004 to John Hancock Mutual Life Insurance Co., one of the initial investors, because TxDOT at the time was only authorized to pay \$11 million. TxDOT then purchased the toll road for \$20 million in May of 2004 (Toll Road News, 2004). While TxDOT did not end up paying the cost of the construction of the toll road, the debacle led to criticism of private financing for infrastructure in the state, and ultimately cost the state US\$20 million.

¹³ With the potential to cause further ill-will towards the use of PPPs in the current political climate in Texas.

¹⁴ Both of these improvements would have been listed in the TIP created by the MPO for Laredo, and the T&R studies should have factored these project improvements into its analysis.

5.5 Process Discontinuities

5.5.1 National/State/Local Plans

The level of detail in planning and who is responsible for planning is also different in the U.S. and Mexico. In the U.S. there are several planning documents commonly developed at the state and local level. Transportation Improvement Plans (TIP) are required to be developed in metropolitan regions across the U.S. by the MPO and aid in tracking regional transportation projects. TIPs are multi-year programs of projects approved for funding by federal, state, and local sources. TIPs are required by the federal highway bills, and are tied into air quality planning. For cities that are in non-attainment for pollution criteria set by the EPA, TIPs must be produced every 3 years, for those cities that are in attainment TIPs must be updated every 5 years. Metropolitan Transportation Plans (MTP) and Rural Transportation Plans (RTP) are also required and these multimodal plans are updated every 5 years outlining a 25 year “blueprint” for transportation infrastructure in their respective MPO and rural regions. The MPOs develop the MTP, and each TxDOT district is required to develop the RTP. Again both MTPs and RTPs are financially constrained documents. This means that there may be other projects that are being considered but which do not have a mechanism for funding ascertained.

The Unified Transportation Plan (UTP) is the means by which state and local infrastructure coordination occurs. The UTP identifies transportation infrastructure needs, selects projects, allocates funds, coordinates with MPOs and local governmental officials, and provides opportunities for public scrutiny and input. All of the local planning documents are then included in the State Transportation Infrastructure Plan (STIP), which determines which projects will be funded by DOTs.

While the U.S. has an extensive planning process at the state and local level, it does not have a unified national plan. While The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), The Transportation Equity Act for the 21st Century (TEA-21), and SAFETEA-LU include provisions and additional funding for coordinated multi-state projects, the actual coordination is left up to the states applying for the funding. While the transportation bills designate out specific priority areas, including “high priority” corridors (which have grown over time due in part to efforts of congressmen to have a corridor in their district) the details are left up to the states (Blank, 2008). Also, over the years control over the funding of many projects has moved from the DOT to Congress. Specific projects are increasingly funded through earmarks, ensuring that the various districts receive funding for their project. This is done, however, without a view of the network and how each project will contribute (Blank, 2008). Therefore the projects are not prioritized based on their contribution to the overall network but based on political appeal. ISTEA, TEA-21 and SAFETEA-LU all contained significant earmarks for projects without any coordinated national vision.

Mexico’s planning situation is very different from that of the U.S. Mexico has a comprehensive NIP that covers not only transportation infrastructure, but also energy, water, and communications infrastructure projects totaling \$141 billion. A significant portion of the NIP, some MXP\$76 billion, will go toward improving energy infrastructure.

While Mexico does have a comprehensive NIP, state plans in Mexico vary widely in their depth and complexity and will often not be accompanied by any definitive funding sources. Under the 1983 Planning Law, all states and municipalities are required to create their own development plans in accordance with the NDP. Most states include a segment on infrastructure

in their development plans, but the development plans are usually laid out as a series of goals, and lack specifics.

However, some states are taking a more active role in infrastructure planning. The state of Nuevo León has a comprehensive infrastructure plan, including demand analysis, an assessment of current transportation infrastructure (including roads, railway, cargo transportation, and public transit), and a multimodal plan for infrastructure development (*Plan Sectorial*).

The state of Tamaulipas has been developing an infrastructure development plan, including sections on roads and transport, urban infrastructure, basic services infrastructure, and tourism infrastructure, among other things. Though there are many references to the plan, however, at the time of writing this report the plan had not been made publically available.

The government of Tamaulipas has taken steps to promote projects of importance at the state level to the national government. The Governor of Tamaulipas met with SCT in January of 2009 to promote those projects that he felt were the most beneficial to his state, including the expansion of the port of Matamoros, Nuevo Laredo Bridge IV and V, the Donna-Rio Bravo crossing, the Reynosa Anzaldúas Bridge, and expansion projects at Altamira. In spite of their more aggressive and comprehensive state transportation plans, Nuevo León and Tamaulipas are still at the mercy of the federal government and SCT when it comes to many decisions regarding infrastructure. However, these states may follow the example of the State of Mexico and seek alternate ways for the states to fund infrastructure.

5.5.2 Environmental Review and Right-of-way

Another difference between the two planning processes is the process by and order in which a project undergoes environmental review and acquires ROW. First and foremost, the processes are opposite in the two countries.

Environmental Review

In the U.S. before any ROW can be acquired, the project must comply with the process of the National Environmental Policy Act (NEPA) and an environmental analysis must be completed. It is through this process that a route is identified and delineated. There are three types of analysis that arise out of the NEPA process: categorical exclusion (CE); environmental assessment (EA); and environmental impact assessment (EIA). For some projects a CE will be determined, this is often for projects that are improving an existing project, or are deemed to have no impact. If the project includes a point of entry, the EIA must be done before a presidential permit will be issued. In the U.S. the EIA also considers several various scenarios, including a 'no-build' scenario, as well as the cumulative and indirect effects of the project. If an unforeseen problem arises during the construction, the project cannot be rerouted without a new EA, costing the project time and money.

Mexico's procedure for environmental clearance and ROW acquisition is opposite that of the U.S. ROW acquisition in Mexico is done before the environmental review. Once the location of the project is determined, and the ROW acquisition complete, an EIA is done on that particular path or location for the project, and provides the permission for the change in the use of soil. In many instances the EIA documents that were reviewed for Mexican projects were focused on project development environmental impacts with a more cursory review on cumulative and indirect environmental impacts. The documents that were reviewed did not include an analysis of the 'no-build' scenario that occurs in U.S. environmental reviews.

Right-of-way Acquisition

ROW acquisition is typically a much lengthier process on the U.S. side than on the Mexican side. One example of this discrepancy is the ROW acquisition for the Brownsville Matamoros Rail Relocation. While the ROW acquisition on the Texas side of the border is expected to take anywhere from 18-24 months, the ROW acquisition took only approximately 60-90 days on the Mexican side of the border (Sepúlveda, 2009).

In this case, general parameters on the location for the new ROW were determined by the officials representing the State of Tamaulipas and SCT with input on technical details provided by KCSM. INDAABIN determined the value of the land and members of a technical group composed of officials from both the State of Tamaulipas and Municipality of Matamoros held town hall style meetings with property owners to discuss the acquisition process and distribute letters of offer for the land (Cuan, 2009). On a few occasions the desired ROW could not be acquired either due to problems in negotiating with property owners or because of land title problems. Under these situations KCSM, provided technical assistance to route the track around the specific properties (Eaton, 2009). While the processes are similar for ROW acquisition, it typically occurs much faster in Mexico than in the U.S.

Another example of the differences in the ROW process is the purchase of what might be termed ‘excess’ ROW for the Anzaldúas Bridge Project. As was the case with the Brownsville/Matamoros rail relocation, ROW acquisition for this bridge project was done by the state of Tamaulipas. SCT generally leaves the ROW acquisition to the states supporting the project, as they are seen to have better access to the landowners, and better ability to complete the ROW acquisition in a timely manner. Although the bridge does not allow commercial traffic until 2015, the ROW required to retrofit the POE checkpoint with additional road space is already available (Erazo, 2009).

One problem with the completion of the ROW acquisition prior to an environmental impact assessment or other studies is that projects sometimes run in to difficulty. This was the case with the construction of the Arco Norte project. During the construction of a portion of Arco Norte, SCT acquired a portion of *ejido* land that had an unauthorized cemetery (essentially a family plot) located on the property. In order to proceed with the acquisition, the cemetery needed to be moved to a new location. Upon excavation, SCT found an archeological site beneath the plot. At this point, INAH took control of this site and SCT was forced to change the Arco Norte’s route (Sánchez Lara, 2009). If the U.S. was linking up to such a route, and had to shift to another ROW route it would have to undertake another environmental review and receive clearance from FHWA if the project is utilizing federal monies, before it could commence further ROW purchases.

5.5.3 Presidential Permits

The process of issuing a presidential permit and then construction of the infrastructure granted by the presidential permit takes a considerable amount of time. The General Services Administration estimates that the construction of a port of entry requires a minimum of 7 years—which includes approximately a year to develop a scope of work or project plan; 2 years for Congressional approval; 2 years to design the port of entry; and 2 years to actually build the port of entry (GSA, 2009). The overall infrastructure required for a port of entry can take significantly longer. Historically there have been lengthy delays between the issuance of a presidential permit and the construction of the infrastructure the permit approves.

The Anzaldúas International Bridge project is an example of a delay between the issuance of a presidential permit and the construction of the actual project. The bridge was first conceptualized in 1990, but it was not until 1999 that the Presidential Permit was signed by Presidents Clinton and Zedillo authorizing development. Still the project did not begin construction until June 12, 2007, and is anticipated to be completed in 2009. Part of the reason for the delay is that the Presidential Permit stated that construction of the bridge could not begin earlier than 2003 and could not become operational before 2005. Even then construction did not begin until 4 years after the presidential permit allowed.

The Donna-Rio Bravo international bridge, connecting the cities of Donna and Rio Bravo, is another example of a presidential permit issued a long time ago that is just now getting off the ground. The six-lane, 1,000 foot project began construction in January 2008 and is expected to be completed by 2010. The project dates back 29 years. In 1979, the City of Donna was issued a presidential permit to construct, maintain, and operate a bridge across the Rio Grande River. Due to a lack of financial resources, the project progressed slowly. In 1993, the city began engineering studies to construct the bridge. Progress, however, remained slow and the project again stalled. In 2002, the Cities of Donna and Mercedes negotiated a partnership to jointly undertake the engineering studies and construction project. The Donna-Mercedes International Bridge Corporation completed the majority of the engineering studies, which were approved by U.S. and Mexican agencies. Nevertheless, the partnership ended following elections (Hinojosa, 2006). The City of Donna then created the Donna International Bridge Corporation to complete the remaining engineering plans and bring the project closer to construction. In 2005, the Corporation received environmental clearance and a U.S. Coast Guard permit allowing the project to be constructed by U.S. Customs. The project officially started construction on January 21, 2008 (Hinojosa, 2008).

According to SCT it is focusing explicitly on existing ports of entry on critical commercial corridors instead of the construction of new points of entry. The aim is to reduce bottlenecks and complete the existing system before considering any new ports of entry. Part of the justification for this is that the process of constructing a new international bridge and point of entry can take over 10 years, as was seen in the cases above.

Though the reasons for delay can vary, such significant amounts of time between the issuance of a presidential permit and the construction of a project, suggest a need to streamline the planning process along the border.

5.6 Security initiatives

The U.S.-Mexico border faces significant congestion problems, partly as a result of stringent security inspections of vehicles crossing between the two countries. Until recently much of the congestion issues were felt on the Mexican side, as northbound traffic backed up trying to enter the U.S. However, due to rising concern over the role of U.S. weapons in the drug trade, Mexico has now implemented searches at the border as well.

According to the federal Attorney-General's Office, Mexico currently inspects only 10% of the 230,000 vehicles that cross the border each day (Olson, 4 April 2009). In March of 2009 Mexico implemented a border inspection pilot program aimed at stemming the flow of illegal weapons into Mexico. The program includes vehicle inspections, weighing vehicles for abnormalities, and cross checking license plate numbers with other government agencies. The pilot program began in Matamoros, Tamaulipas and is expected to be expanded to other points of entry by the end of the year (Miller, 2009). The entire weighing process is claimed to take only

8 seconds. Cars that weigh more than they should for their make and model will be sent to a secondary inspection (BBC, 2009).

The U.S. has also increased its border security measures as a result of rising drug violence in Mexico. In late March 2009 the U.S. unveiled a border protection plan that calls for increased traffic inspections southbound, including 100% inspection of rail cars bound for Mexico. The U.S. announced plans in April 2009 to spend more than \$400 million upgrading entry ports and surveillance systems along the border (Miller, 2009). The full impact of these new programs on congestion at the border is not yet known.

Increased border delays also impacts local infrastructure that connects to international crossings. For example with the Anzaldúas Bridge, expected to open this year, TxDOT will be responsible for improving connection to the border and ensuring that local infrastructure is sufficient to support the bridge (MEDA, March 2009). Delays caused by southbound border inspections will place additional pressure on the local infrastructure, and on TxDOT to insure these delays are mitigated.

Anti-terrorism legislation ramping up inspections at border stations is federally mandated and often existing facilities are unprepared to deal with increased inspections. There is no funding allotted for transportation infrastructure facilities in customs and border patrol funding. The lack of coordination between infrastructure plans and border security plans means that infrastructure is often caught off guard with insufficient resources to perform the required inspections. This disconnect is leading to even greater border congestion. One solution to this issue could be to create single inspection facilities at the border.

5.7 Concluding Remarks

Mexico and the U.S. are at different junctures in their infrastructure lifecycles but are both facing considerable challenges especially regarding the reliability and continuation of their sources of infrastructure financing. As both countries begin to shift out of the economic downturn they may also face a new global supply chain dynamic, as new trade corridors emerge, placing new impacts on their integrated networks and requiring enhanced cooperative planning. The next chapter discusses the current state of cross-border planning and makes recommendations for continuing this process.

Chapter 6. Selected Border Coordination Issues

Texas and Mexico share 1,254 miles of the roughly 2000 mile border between the U.S. and Mexico. There are currently twenty-six border crossings (Figure 6.1) serving as the direct links between the infrastructure networks of Texas and Mexico. Of these, twenty-three are bridges, two are dam crossings, and one is a hand-drawn ferry (RJ Rivera 2008).



Source: Texas State Comptroller, 2001

Figure 6.1: Texas-Mexico Border Crossings

The border area between the U.S. and Mexico is also populous. In 2000, about 12.5 million people lived in the U.S. counties and Mexican *municipios* along the U.S.-Mexico border. Approximately 6.3 million people (51%) resided in the twenty-five U.S. border counties and about 6.1 million people (49%) lived in the thirty-five Mexican border *municipios*. Population in counties and *municipios* along the U.S.-Mexico border is projected to increase more than 50% between 2000 and 2020, from 12.5 million to 19.3 million residents. About 10.5 million people (54%) would reside in Mexico while 8.8 million (46%) would live in the U.S. (JWC, 2004). Border residents rely on an integrated transportation network that links these communities.

Trade flows between the NAFTA countries grew significantly in the past decade, although there has been a dramatic drop since the global economic downturn began in 2008.

Canada and Mexico are the U.S.'s first and third largest trading partners respectively, and Mexico is Texas's largest trading partner. After NAFTA's signing, trade flows shifted in the U.S. from predominantly east-west to increasingly north-south. This shift made border infrastructure a vital focus for U.S. transportation as goods travel overland to and from Mexico and Canada (JWC, 2004). The increase in trade between the two countries led to problems at the border, as infrastructure attempted to cope with more traffic than it was designed to handle (JWC, 2004).

Trade flows in goods and services between the U.S. and NAFTA partners, since its inception, totaled \$1.0 trillion by 2007 (U.S. Trade Representative, not dated). The U.S. had \$967 billion in total (two ways) goods trade with NAFTA countries during 2008 (U.S. Trade Representative, not dated). The sheer volume of NAFTA trade requires a robust infrastructure network and system suitable to support such trade movements (JWC, 2004). 75% of trade between the NAFTA countries is carried by commercial trucks and in 2008 more than 4.8 million trucks crossed the U.S.-Mexico border alone (BTS, not dated).

The border region is an important economic driver for both Mexico and the U.S. The four Mexican states that border Texas (Chihuahua, Coahuila, Nuevo León, and Tamaulipas) prior to the economic downturn represented

- 24% of the manufacturing output in Mexico,
- 48% of Mexico's output of metal products, machinery and equipment, and
- 55% of the total Maquiladora employment in the country.

The entire border region received 75% of the foreign direct investment in the country (Estado de Nuevo León, 2007).

As was discussed in earlier chapters, there are several differences in the transportation planning processes in Mexico and the U.S. While the two systems have significant differences, the researchers found that these differences can be addressed as part of the existing planning process, as long as advanced planning is performed. The policies enacted at the border were found to be part of a larger body of regulations tied to commerce and security, and as such, it is unlikely that the border process could be fully harmonized in the near-term without legislative changes at the federal level. However, there are several measures that could be taken to improve border planning, including an examination of projects away from the border to inform border infrastructure and determine where likely future cross-border traffic will be generated, and developing more comprehensive border plans to align these projects up.

It should be noted that this chapter does not focus on process and procedures within the port of entries themselves, but rather on the infrastructure that links the ports of entry (POE) and the plans that underscore these projects, as well as initiatives that are being developed to improve border planning.

6.2 Current Cross Border Planning

6.2.1 Border Coordination Groups

Currently there are several border transportation coordination efforts underway. First and foremost among them is the U.S.-Mexico Joint Working Committee on Transportation Planning and Programming (JWC). The JWC was established in 1994 in light of anticipated increased traffic due to NAFTA and is led by the Federal Highway Administration (FHWA) on the U.S. side and SCT on the Mexican side. The group's primary purpose is to "cooperate on land transportation planning and the facilitation of efficient, safe, and economical cross-border

transportation movements”(JWC). The JWC membership includes representatives from the Department of State, the Mexican Secretariat of Foreign Relations, the departments of transportation of the four border states, and government representatives from the Mexican border states. The group meets twice a year to develop biennial work plans. Additional teleconferences and other exchanges are initiated throughout the year to implement the biennial plans and other initiatives (FHWA at the Border). The last JWC meeting was held during July 2009 in Santa Fe, New Mexico (JWC).

Another cross-border initiative is the border technology exchange program which is intended to provide better training for border personnel on both sides of the border through the exchange of technology, information, and technical training. The program is a collaborative effort between the FHWA, the DOT’s from the Mexican border states, the SCT, and state officials responsible for transportation in the Mexican border states. Each state in the partnership develops an annual work plan with its partner state including symposia for employees, informational and certification courses, site visits, and personnel exchanges to further cooperation between entities. Several such events are also planned on a border-wide level. There are also technology transfer centers in each of the state universities of the Mexican border states (FHWA at the Border).

The U.S.-Mexico Bi-national Commission is another international group that deals with transportation. Established in 1981 by U.S. President Reagan and Mexican President Lopez Portillo, the group is composed of U.S. cabinet members and their Mexican counterparts (U.S. Department of State). The commission holds annual plenary meetings and several yearly sub group meetings to discuss issues like border security, transportation, narcotics trafficking, trade and investment opportunities, border affairs, and counterterrorism, among other things (FHWA at the Border).

The Bi-national Bridges and Border Crossings Group (BBBXG) meets semi-annually to discuss border crossing issues and expansions. The group is co-chaired by the Department of State and the Mexican Secretariat of Foreign Relations (JWC). The meetings consist of a U.S. delegation meeting, a public session day, and a technical session day and is attended by government agencies and other organizations with a stake in the border (FHWA at the Border).

The Border Liaison Mechanism (BLM) is a state and local level problem solving mechanism operated in “sister city” pairs. The meetings are chaired by Mexican and U.S. Consuls Generals, and typically include officials from federal, state, and local agencies, as well as the private sector. The BLM is meant to deal with a range of issues from accidental violation of sovereignty, to treatment/mistreatment of nationals, to security, and to public health (FHWA at the Border).

Individual cooperation between states on either side of the border has increased since the signing of NAFTA. In 2004, Texas Governor Rick Perry signed Memoranda of Understanding with the governors of the states of Tamaulipas, Coahuila, Nuevo León, and Chihuahua. The main objective of these was to create jobs and expand economic opportunities along the border. The agreements call for an integrated approach to regional economic development, public safety, energy, telecommunications, health, education, and infrastructure.

Another cross-border planning mechanism is the Border Governors conference. The Border Governors conference first met in 1980 and consists of meetings between state administration officials of the U.S. and Mexico border states. The conference gives the governors an opportunity to discuss a wide range of border issues (FHWA at the Border). The last Border Governors Conference was held in Monterrey, Nuevo León from September 2-4, 2009 (Border

Governors Conference, 2009). One major goal of the Monterrey meeting is to develop a border master plan for the region. Guidelines for this have already been published.

In Texas the Border Trade Advisory Group (established in 2001 by the Texas Legislature) has met several times. Its 2008 report, listed its four goals that were developed during 2006 which it had focused its efforts upon. These included:

1. promoting the development of ample and expandable trade transportation corridors,
2. developing coordination mechanisms to foster trade between Mexico and Texas,
3. leveraging safety and security measures to enhance trade efficiencies, and
4. demonstrating the economic benefits of international trade at the national, state, and local levels.

Strategies to address these goals were formulated by the group and the 2008 report by the group to the Texas Secretary of State outlined the status of how these were being addressed and developed (BTAC, 2008)

6.2.2 Cross Border Trucking Initiatives

Since NAFTA was implemented the provision granting Mexican trucks the right to operate in the U.S. has yet to be implemented, and consequently the increased cross-border traffic this provision was expected to generate has not been fully realized.

In 2007 President Bush implemented a pilot program to allow a small number of Mexican trucks access to the U.S. and test safety inspection measures. Despite a congressional measure to delay the program it eventually went ahead. According to a Department of Transportation report on the program, the Mexican trucks included in the program had fewer safety violations than their American counterparts (The Economist, 2009).

Cross border trucking faced another setback in early March of 2009, when the Senate excluded it from the funding bill, effectively ending the program. On March 18, 2009 Mexico announced higher tariffs on 89 products representing approximately \$2.4 billion worth of exports from the U.S. in retaliations for the end of the pilot program (Ellingwood, 2009). The list of goods was crafted to have a minimal impact on Mexican staples imported from the U.S. while covering a wide range of goods from forty U.S. states to maximize political impact (The Economist, 2009). Because the trucking initiatives have not been fully implemented, the U.S. has not seen the full impact on its highway system that the provision could generate. Yet, in other ways, border congestion is made worse by the redundant trips necessitated by the border transfer zones. While both countries have vowed to reach an agreement on the issue, as of August 2009 no compromise had been reached. An August 17 follow up audit by the Office of the Inspector General, stated that the safety rules for Mexican Truck and Bus inspections at border ports of entry were still unmet (FMCSA, 2009).

6.2.3 Local Government Cooperation

With regard to planning coordination, there have been activities aimed at creating more coordinated border plans at the local level, for example, the California-Baja California Border Master Plan, which was completed in September 2008 (SANDAG, 2008). This Border Master Plan was a bi-national comprehensive approach to coordinate planning and delivery of projects at land POEs and transportation infrastructure serving those POEs in the California-Baja

California region.¹⁵ SCT indicated during the researchers interviews that it was looking to do the same kind of activity on the Texas-Mexico border. In the summer of 2009 TxDOT began work on the Laredo Border Master Plan.

SCT has also been working with MPOs and RMAs in Texas to improve the planning process. For example, SCT noted that they were working with the Hidalgo RMA to ensure that the RMA loop plan was aligned with the new loop in Reynosa that is currently being built. So they are striving to make sure that projects they undertake at the border link-in to plans on the U.S. side.

6.3 Changes Needed

In terms of institutional discontinuities between the legal and financial systems in both countries, the two systems are not so different that they cannot work in concert. While processes like Right-of-way and the Environmental Review are done in reverse order, the two systems have thus far been able to work together reasonably well. Since it is unlikely that either country will choose to change its processes to align perfectly with the other, greater attention should be given to determining how the existing systems can better coordinate within the bounds of their existing processes. Consequently, what should be undertaken, instead of an effort to fully harmonize the systems, is an effort to develop comprehensive border master plans, with more entities involved in the planning process and a greater scope, including an examination of projects away from the border which may have trade or transportation impacts.

6.3.1 Involving the Private Sector

As was identified in Chapter Five, there are often many players in infrastructure projects, especially cross-border projects. This can lead to conflicting jurisdictions, as was demonstrated with the example of the Laredo V Bridge. To help avoid such conflicts, the scope of the planning process should be widened to include all of these actors and all of the actors must be willing to participate productively in the process.

Bringing all of the entities involved in planning together also requires engagement of the private-sector in plans, particularly in Mexico, where the research team identified a significant reliance on the private sector for infrastructure finance. As the case studies demonstrated, the private-sector has, in some instances, significant leverage over which projects are completed. Understanding how the private-sector operates in Mexico will also lend a greater degree of predictability to which projects are likely to go forward, as the more eager the private-sector is for a project to be completed the more likely it is to succeed. In the Brownsville/Matamoros case study, KCSM will ultimately determine if the project moves forward because the project is dependent on a ROW swap for KCS's existing rights. If KCS does not accept what decision is made in terms of tolls for the new bridge, they can stall the project by refusing the swap. Therefore, in instances like this, the private-sector must be involved in negotiations from the beginning to avoid a potential derailing of projects.

Furthermore, Mexico is a very federally centered system. The states and cities have very little power to raise money for infrastructure projects, as was discussed in Chapter Four. The

¹⁵ The California Department of Transportation (Caltrans), in partnership with the Secretariat of Infrastructure and Urban Development of Baja California (Secretaría de Infraestructura y Desarrollo Urbano del Estado de Baja California or SIDUE) and the US/Mexico Joint Working Committee (JWC), retained the San Diego Association of Governments (SANDAG) Service Bureau to assist in the development of this Plan.

states also have very limited decision making ability in terms of infrastructure priorities, much of this is governed by SCT. With a federally centered system, understanding the NIP and its priorities can shed light on decisions made at the border.

The decentralization that is occurring in Mexico is mainly transferring the funding from the federal government to the private sector, with 58% of NIP projects to be financed through private sector involvement. Decentralization for planning to the state and local level is also occurring, and consequently some states are also seeking means outside of the federal government to fund infrastructure projects, yet different states have differing levels of financial independence from the federal government. In order to improve border planning it is important to be apprised of private sector activities throughout the country because they are often focused on how a particular infrastructure asset fits into the system as a whole, and how it will affect trade flows and traffic volumes.

6.3.2 Broader Focus in Border Planning

The most important change needed in terms of infrastructure planning serving POEs on the U.S. side is a broader focus. When planning border projects, the various U.S. entities must be more aware of what is occurring internally in Mexico away from the border. While the ports of entry and bridges are parts of border planning, it is important to remember that they are small parts connecting two much larger systems.

In discussions with various players in projects in Mexico, it was clear that most were very aware of infrastructure projects in Texas with a possible impact on their respective areas of transportation. SCT indicated that in the Mexican plan for the modernization of the bi-national system, SCT reviewed U.S. corridors of strategic importance. The IH-35 corridor was listed in presentations that SCT provided to the researchers along with the Canamex Corridor and Trans Texas Corridor(s). This attention to projects away from the immediate border area, show an effort on Mexico's part to understand how larger corridor projects will impact border traffic.

In Mexico the NIP is the outline for the country's desired transportation growth through 2012. To understand where future traffic flows will likely originate, it is important to look at the plan in its entirety in terms of a system in order to judge infrastructure capacity needs at the border. One example of a project that is not a border project but that has the potential to significantly affect cross-border volumes is the Mazatlán-Durango highway. The Mazatlán-Durango highway is a cornerstone project of the NIP, and finishes off the last section of a corridor stretching from Mexico's Pacific coast to the Gulf coast. Traffic along the highway will feed mostly to Laredo and Matamoros. In fact, the Mazatlán-Durango highway is a section of a much larger corridor typically termed the Mazatlán-Matamoros corridor, and is intended to connect the Mexican Pacific Coast with the industrial center of Monterrey and to the border. The completion of this project will allow trade flows from the Pacific coast to the border, and while it is not a border project, it is likely to have an effect on cross-border trade volumes.

Another example of a project with possible implications for the border is the expansion of Lázaro Cárdenas. While the initial forecasts for Lázaro Cárdenas assumed continued saturation at the ports of LA/Long Beach, which has not proven to be the case partially as a result of the current economic downturn, there is still the possibility that higher cargo volumes will use Lázaro Cárdenas as a port for cargo destined for the U.S. KCSM's development of the NAFTA rail line makes the shipment of cargo by rail from Lázaro Cárdenas to Kansas City a possibility. So while the project is not on the border, it has the potential to increase rail volumes crossing the border and therefore should be considered in the overall border planning process.

Texas should also be aware of expansion plans in Manzanillo which could result in increases in cross-border traffic on the UP or BNSF Railroads. Currently the largest container port by volume in Mexico, Manzanillo has several aggressive expansion plans aimed at increasing connectivity to Guadalajara and Monterrey, which could impact traffic at the border and increase flows on UP and BNSF lines.

Several other highway projects are meant to build connectivity that would aid trade flows from central Mexico and industrial centers like Monterrey to the border. For example the Arco Norte project will allow cargo from the south to flow more easily around Mexico City and consequently provide increased access to Pacific ports and also to the border. Also, there are several city bypasses underway, such as the bypass around Torreón, which could funnel additional traffic to the U.S. border at El Paso.

As Mexico implements the NIP (which was designed to increase competitiveness in international trade) and improves the overall quality of its infrastructure network, the country will enhance its ability to serve the U.S. market. Since the U.S. is by far Mexico's largest trading partner, it is only logical to assume that increased infrastructure trade capacity will generate increased volume of trade with the U.S. Therefore, in planning border infrastructure projects in the U.S., planners must look at the entirety of Mexico's infrastructure as a system to determine where likely future volume growth will be centered.

6.3.3 Mexico's Focus on Existing Corridors

The focus of the NIP is the completion of existing corridors. SCT stressed that, in terms of border projects, Mexico is focusing primarily on expansion of existing ports of entry to meet demand, and increased connection of these to inland centers of industry. According to SCT enhancing the border related infrastructure is strategic for Mexico since 78.3% of international trade is with the United States. SCT noted that it is focusing explicitly on existing ports of entry on critical commercial corridors. SCT has a significant amount of work to do in streamlining these corridors before they can shift focus to future corridors. The aim is to reduce current bottlenecks and complete the existing system before turning to consider any new ports of entry.

SCT enumerated the three level planning process it was undertaking:

- Improve Highway Corridors (consistent with both Mexican and American existing corridors in order to develop a bi-national system of highway corridors)
- Regional Focus (projects to increase connectivity between ports, multimodal, and borders)
- Ports of Entry (expansion in current bridges, adoption of technology, etc.)

SCT noted that while the focus will be on expansion of existing corridors to meet the current need, the government nonetheless is in the process of completing several additional border bridges. Two bridges are expected to be completed in 2009/2010, including the Reynosa-Anzaldúas Bridge, covered in Chapter Four. One issue with expansion of current bridges is dense surrounding land use. Many of the existing bridges are in or near population centers. This was the case in the Brownsville/Matamoros rail relocation. The rail lines currently run through increasingly dense population centers in Brownsville and Matamoros, which creates several safety issues, including the potential for hazardous materials spills or accidents on the tracks. In this case a new bridge and rail relocation was deemed a necessity as opposed to an expansion of the existing bridge and rail facilities.

6.4 Concluding Remarks

From examining various border projects and the case studies of projects not at the border, the research team identified several discontinuities in the infrastructure planning processes in Mexico and the U.S. While neither country is compelled to, nor is likely to change their planning process, several steps could be taken to increase the effectiveness of border planning efforts. First, both countries should be aware of and actively monitor developments away from the border that could affect potential border traffic. As the case studies demonstrated, projects throughout Mexico have the potential to impact infrastructure needs at the border. Therefore the scope of border infrastructure planning should be widened geographically to include assessment of other projects that could generate trade flows to the border.

Second, the scope of border planning must be widened to include increased involvement of non-traditional actors, especially the private sector companies currently involved in transportation finance in Mexico because of their potential impact on the process. Both of these goals can be achieved through more extensive and cooperative border planning and the development of broader scope border master plans. Developing comprehensive plans that address these various aspects and keep this side of the border apprised of potential traffic generating developments internal to Mexico will go the furthest toward reconciling the two systems without requiring significant changes to either countries planning process.

Chapter 7. Concluding Remarks

The scope of this 2 year research project was intentionally broad in order to gather information on a variety of policies and processes used by Mexico to conduct its transportation infrastructure planning, financing, and development. Chapter Two provides a primer on the political, legal, financial, and policy underpinnings of Mexico's transportation infrastructure development and outlines the NIP. Chapter Three—developed from a series of interviews undertaken throughout Mexico—outlines the state of the practice in transportation planning and implementation for highway development, and shows how decentralization is occurring. Chapter Four is devoted to twelve major case studies that were undertaken during the second year of study. These cover multiple modes, geographic areas, and funding sources with a view to providing the reader with an insight into the various mechanisms and processes used in Mexico. Chapter Five outlines the differences between the U.S., Texas, and Mexico's infrastructure plans, programs, and financing. While the two systems have significant differences, the researchers found that these differences can be addressed as part of the existing planning process as long as advanced planning is performed. Chapter Six analyzed some selected border coordination issues, and their importance for the U.S. and Texas and makes recommendations for continued *and* enhanced future cross-border planning. This chapter (seven) provides concluding remarks.

Historical Perspective

Historically, each mode of transportation within Mexico was developed independently and attention to network interconnections, either between or within modes, was lacking. This led to higher logistic costs and inventory levels, which impacted competitiveness and productivity. Several recent presidential administrations within Mexico sought to improve the transportation network; yet financial constraints continued to hamstring Mexico's ability to reach a level of investment to allow it to compete globally. To a great extent, the development of Mexico's statutory processes for its transport sector has mirrored the political and economic evolution that was taking place at the macro level.

The focus regarding the importance of improving transportation changed with the implementation of constitutional provisions and legislative changes regarding development planning and financing throughout the late 1990s and early 2000s. In 2006 transportation took a dramatic leap forward when President Calderón announced an aggressive NDP and in 2007 when his administration laid out the aggressive NIP that covered four areas; transportation, energy, communications, and water.

The NIP includes three investment scenarios that are underpinned by the success of tax and other budgetary reforms. While the NIP includes an "inertia" scenario in which there are no reforms to the government budget process and taxes, it is still unclear as of the drafting of this report in fall 2009 how the sharp drop in oil prices will affect the government's overall spending on infrastructure, since the NIP was developed when oil prices were much higher. The inertia scenario, *in other words*, implies a continuation of past trends as opposed to the contraction that has been seen in the transportation sector, since publication of the NIP and the onset of the global economic downturn.

Politics

The political process in Mexico with term limits for public officials plays a role in whether a continuum of planning across multiple funding years and administrations will occur. Mexico, with its federally centered system, revolves around the presidential elections held every 6 years (term limited to one-term). Midterm elections were held on July 5, 2009. All 500 seats in Mexico's lower house were up for reelection and the President's party (PAN) lost seats. Although the PAN still holds the largest share of any single party, and the most seats in the Senate, it does not have a majority. This outcome may make it difficult for Calderón to steer his legislative agenda in the remaining 3 years of his presidency, including tax reforms that underpin aggressive NIP scenarios. The Institutional Revolutionary Party's (PRI) opposition leaders have said they oppose tax hikes, but seem to be willing to change some income tax laws (Lange, 2009). The PRD, leftist opposition party, is generally opposed to reforms. Though the outcome of the midterm elections is likely to affect fiscal reform, it may not directly affect the NIP if the inertia scenario is followed.

While it is not always immediately obvious how political agendas affect a project, politics is prevalent in infrastructure decisions on both sides of the border. Political decisions play a role in the funding of projects in the U.S. through earmarks and in the designation of corridors of importance. In Mexico, discretionary political criteria for choosing projects has been reduced considerably over the years, but still exists and as decentralization takes place states may play a bigger role in the development of new routes and in strategic infrastructure priorities.

Underlying Funding Problems

Mexico and the U.S. are facing challenges in financing their transportation systems. U.S. gasoline taxes at the federal (and local level here in Texas) have been eroded by inflationary effects because they have not been raised in over 18 and 16 years respectively. Mexico's budget is centralized and reliant on PEMEX revenues. Transportation has to be placed into a budget against many other competing policy objectives. While private financing opens the door for efficiency and competition and relieves pressure on the Mexican government to finance projects, it also requires a robust private-sector and global financial market. Mexico successfully raised US\$4 billion in 2007 through its Asset Utilization model to infuse FONADIN and offset, to a certain degree, what might be termed the *PEMEX issue*. However, this has meant that Mexico is reliant on the private sector and the global market to finance continued infrastructure development. As the global economic downturn took hold it affected Mexico's capacity to raise capital for FONADIN. If funding issues persist, the U.S. and Mexico will have less money for construction and maintenance of infrastructure. Furthermore, the demand that underscored the need for many of these projects has diminished as the global economic crisis took hold. Projects in both the U.S. and Mexico have been delayed or postponed due to lack of funding, or because trade patterns have dramatically declined. To date, President Calderón has insisted on the continuation of the NIP as a means to combat the recession, even if it requires running a deficit.

Changing Mexican System

Mexico's federal transportation policy, since the 1990s, has begun to decentralize the responsibility for planning infrastructure projects from SCT to the states, and the responsibility for much of the financing and construction of infrastructure projects to private sector companies and autonomous public sector entities. However, the federal government still maintains a strong and in many cases dominant role, even though infrastructure planning under the Calderón administration is moving in the direction of joint action and responsibility. The NIP goes much further in solidifying and quantifying the role of private and non-federal participants in advancing broad development goals and developing different transportation modes within the greater concept of a transportation system. This trend toward thinking of the various modes as part of a system was evident in several of the case studies where projects were being constructed with other complementary infrastructure developments in mind. For example, the Lázaro Cárdenas container terminal being developed in concert with improvements to the KCSM double stack rail connection to Mexico City and other points north. SCT also noted that it reviews planning activities that are occurring in the U.S.—especially trade corridors. For example, the decision to build and expand roads and bridges in the Northeast region (Asset package of the Northeast) was triggered by the possibility of the Trans Texas Corridor (TTC), though according to SCT the projects will continue with or without the TTC because they were also *principally* aimed at connectivity within this area of Mexico.

Transportation planners in U.S. states that border Mexico should continue to monitor the changing dynamics in Mexico's political and fiscal policies, as well as any new long-term transportation infrastructure plans that may be developed nationally and at state level which will impact trade and trade corridors into the U.S.

Coordination among Stakeholders

Several projects included in this study exemplify the necessity of coordination among various players in both the public and private sector. Projects in this study include cross-border coordination between the U.S. and Mexico, as well as coordination among public entities, private concessionaires, and various modes of transportation, such as rail and road. The most complex and, in some ways successful, coordination project has been the Mexico City Commuter Rail, which required eleven collaboration agreements between the multiple parties that were involved with the project. These were signed over a period of 6 years (the first was signed on June 11, 2003), failure in any one of these agreements could have derailed the entire project. This also highlights that public officials are cognizant of the importance of many of these projects and are willing to make the necessary concessions that may be required to bring them to fruition.

It is obvious that project success is often directly linked to the coordination among various stakeholders. Projects that maintain open communication and collaboration throughout the planning and implementation process face fewer difficulties and roadblocks.

Environmental Review, ROW Processes and Public Outreach

Many of the projects in this study encountered environmental challenges as they were being planned and developed, as well as during construction. However, the projects were able to pass the environmental review with enough support behind the project. Although, the timing of the environmental review, after ROW has been acquired, may be problematic for TxDOT and U.S. parties who are collaborating on projects and may lead to unforeseen costs and change orders.

Increasingly international organizations are getting involved in Mexico's environmental process. This may lead to more stringent environmental reviews in the future.

In the case of the Reynosa Anzaldúas Bridge, alignment of an access road that was not in the initial design and therefore not in the initial environmental review (and connects to Monterrey, the third-largest city in Mexico) and the misalignment of the roadway and a port facility building led to unanticipated costs.

For some projects—for example, Lázaro Cárdenas, Mazatlán-Durango Highway, and the Mexico City Commuter Rail—the public has been exceptionally supportive and the projects are proving to be able to not only generate income for their regions but also public goodwill. In other instances, however, the lack of public support may provide the critical fulcrum point at which the projects may become politically problematic. The port of Manzanillo, for example, will be a problematic project because of both environmental and public distrust issues. Similarly, the news about the *ejido* land that was expropriated for the port of Altamira came back in June 2009—26years after the expropriation—to haunt the parties involved, especially SCT regarding the legality of this eminent domain process that was used to acquire the ROW. In any instances where *ejido* land is in the mix, U.S. partners in projects should be aware of potential public relations issues that may come to the forefront if the acquisition process is considered to be opaque by some *ejidatarios* or other non-profit groups.

Transportation Network Lifecycle Development and Finance

Mexico and the U.S. are at two fundamentally different places in their infrastructure development, which impacts how both countries will continue to plan and manage their respective transportation budgets. While the U.S. is confronting aging infrastructure and congestion, Mexico is trying to complete its transportation network. The NIP focuses primarily on the completion of existing corridors and the connection of major centers of industry in the country. There should not be any significant surprises to TxDOT in the Calderón Plan because in most cases it does not build new corridors, but rather seeks to finish existing roadways or upgrade existing corridors sufficiently to support international trade.

As the US continues to have to face the ever-expensive continued upkeep and maintenance of its aging system (barring a dramatic increase in a funding source) Mexico may find it increasingly difficult to promote 'new' projects in partnership with the US both at the border and those that may impact the border.

Better Border Planning

From examining various border projects and the case studies of projects away from the border, the research team identified several discontinuities in the infrastructure planning processes in Mexico and the U.S. The policies enacted at the border were found to be part of a

larger body of regulations tied to commerce and security and, as such, it is unlikely that the border process will be fully harmonized in the near-term. However, there are several measures that could be taken to improve border planning.

Both countries should be aware of, and actively monitor, developments away from the border that could affect potential border traffic. As the case studies demonstrated, projects throughout Mexico have the potential to impact infrastructure needs at the border. Therefore the scope of border infrastructure planning should be widened geographically to include assessment of other projects that could generate trade flows to the border. Second, the scope of border planning must be widened to include increased involvement of non-traditional actors, especially the private sector companies currently involved in transportation finance in Mexico because of their potential impact on the process. Both of these goals can be achieved through more extensive and cooperative border planning and the development of broader scope “Border Master Plans.” Developing comprehensive plans that address these various aspects, and keep the U.S. side of the border apprised of potential traffic generating developments internal to Mexico, will go the furthest toward reconciling the two systems without requiring significant changes to either countries planning process. Finally, in order to improve border planning, it is important to be apprised of private sector activities throughout the country because they are often focused on how a particular infrastructure fits into the system as a whole, and how it will affect trade flows and traffic volumes, rather than focusing each project independently.

The transportation systems of both countries have a long legacy of developments that took very different courses yet have arrived at remarkably similar destinations. This congruity underscores the fact that the needs of the Mexican and U.S. populations from their transportation system are similar and interdependent. Further integration of the transportation networks beyond the border zone is a necessity for improving the performance of both systems and their ultimate value to the population.

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APPENDIX A: Legal Review of Mexico's Planning, Budget, Finance, and Development of Transportation Projects

Introduction

Since the 1980s, Mexico has experienced a profound transformation in redefining the role of the state in the economy and framing new responsibilities of federal and local governments. These amendments, driven in part by the opening up of the economy following the North America Free Trade Agreement (NAFTA) agreements, are still evolving (Pokorny, 2001).

The development of Mexico's planning processes for the transport sector mirror, to a great extent, the political and economic evolution that is taking place at the macro level. After the NAFTA agreement was in place, the government explicitly acknowledged that the country's economic growth critically depended on the development of its external trade and, for growth in this area to be sustained, that transport infrastructure and services would be prioritized (Pokorny, 2001).

The changes in the transport planning sector are being driven by the rapid advances of the federal government in terms of two key initiatives: greater private sector participation and increasing decentralization of responsibility for the sector to local governments. Since the 1990s transport policy has emphasized three main objectives (Pokorny, 2001):

- Increased private sector participation in the provision, operation, and maintenance of transport facilities
- Deregulation of the sector, retaining only public provision of services not financially attractive to private investors but economically justified
- Changing the Secretariat of Communications and Transport (*Secretaría de Comunicaciones y Transporte*, SCT)'s role from operational to normative and promotional functions

Despite the trend towards privatization of transport infrastructure, it is not possible for a private sector transport project to be completely divorced from the government. Infrastructure projects have inherent social implications and ultimately the government will always have a role. (Mates, 1996).

The first part of this technical memorandum explores the constitutional background of transportation planning in Mexico and recent constitutional amendments that have led to the current transportation policy. The development of social and economic rights, planning regulation at the constitutional level, and new property, environmental and eminent domain guidelines have all contributed to increase planning activities in the country.

The second part analyzes key laws, especially focusing in the historical development of planning regulation in Mexico. Coordination at the federal, state, and municipal level has been important in order to implement each National Development Plan (*Plan Nacional de Desarrollo*, PND). In the past, foreign investment restrictions had made Mexico less attractive for private investment in transport infrastructure projects.

The third part summarizes and examines the activities of some of the relevant state and federal agencies. In this case, SCT and the Foreign Relations Secretariat (*Secretaría de*

Relaciones Exteriores, SRE) are the more active secretariats in charge of promoting transportation planning at the local and international levels.

The fourth section provides a brief status description of the five main transportation subsectors along with analysis. A concise analysis of Mexico's current situation of roads, railroads, ports, airports, and intermodal transportation helps to better convey how all the amendments to transportation and planning laws have affected these areas.

The fifth section reviews international regulation applicable to transport planning. Specifically, focusing on border planning according to NAFTA and U.S.-Mexico Joint Working Committee on Transportation Planning (JWC)'s memoranda of understanding—although some non-regulated committees and organizations have also played a key role related to border transport planning activities.

Section six reviews transportation sectors within Mexico. Highway, road, port, airport, and multimodal transportation have developed in different ways throughout the last decade. A brief report is presented related to each mode.

Section seven provides conclusions on the legal framework. Mainly, this section explores the effects of privatization in transport infrastructure in Mexico, as well as proposing some recommendations concerning the way planning processes should be adapted to fit the new privatization schemes.

Section eight reviews Mexico's budgetary process as a key determinant to understand the planning process in the country. The section includes a description of the necessary steps to get the federal budget approved and of Mexico's revenue sharing structure between the federal and state governments. This section also addresses the nature of funds and taxes for infrastructure.

Section nine ends this technical memorandum with a review of how the National Infrastructure Program announced by President Calderón in 2007 fits in with budgeting processes.

Constitutional Background

Mexico has a legal tradition that is structurally distinct from that of the United States. Mexico can be catalogued as a civil law country while the U.S. is part of the English common law tradition. The foundations of the civil law tradition that is currently the dominant legal tradition in Europe and Latin America can be traced to the Renaissance. Civil law systems are set up to minimize the ability of the judiciary to actively interpret laws. Therefore, the legal codes in civil law countries tend to be more comprehensive so that laws can be applied to any situation, thereby minimizing active interpretation by the judiciary. This concept became the cornerstone of the early civil law tradition¹⁶ (Sinnott, 1999). This basic and foundational division in legal systems has colored many aspects of Mexico's economic and political development vis-à-vis the United States and must be noted in interpreting present day legal developments within Mexico.

In civil law countries, a strict separation of powers developed within the government and the power to enact laws was conferred to the legislature. The role of the judiciary was greatly limited. Judges simply selected the proper statutes to apply to specific situations. Judges did not interpret incomplete, conflicting, or unclear legislation. They referred ambiguities back to the legislature for interpretation. This prevented the creation of new laws or precedents emerging

¹⁶ The civil law system first came to use in the age of European Reformation, when feudalism was abandoned and replaced by modern nation-states. Through an ever-growing attitude toward state sovereignty, the acceptance of the widely held Roman-Canonic *jus commune* (the common law of feudal Europe) was subordinated, and the state emerged as the primary source of law (Sinnott, 1999)

through judicial decisions. The familiar U.S. legal principal of binding precedent (or *stare decisis*) therefore has a far less significant role in these systems.

The modern Mexican legal system is a direct descendent of the Western European civil law tradition. Spanish rule of Mexico, for 300 years, left a lasting impression on many facets of the Mexican culture (Sinnott, 1999). Spain introduced the European civil codes into Mexico, which have dictated the development of the current legal system and governmental structure.

The English common law tradition evolved much differently than its civil law counterpart. It originated nearly 900 years ago as an attempt by the King of England to consolidate his power through the application of uniform laws (Sinnott, 1999). Achieving uniformity of law is the basic premise upon which the common law was founded (Sinnott, 1999).

The common law tradition instructs that the best way to administer uniform justice is to keep judicial decisions as consistent as possible. This philosophy precipitated the principles of binding precedent and *stare decisis*. Incorporating former decisions into current adjudications produced a body of principles which reflected a line of similar reasoning in deciding cases. This became accepted as the common law of England (Sinnott, 1999).

Even if the United States is considered to be a common law country, it is an error to say that "judge-made" law continues to be the prevalent source of law today. Since the beginning of the twentieth century, there has been an influx of statutory enactments in both the federal and state legal systems (Sinnott, 1999). Many of the early statutes were codifications of widely accepted common law principles, and replaced the common law in that area. Many others created new areas of law, which emerged from the changing society.

Although statutory law is now prevalent, and supersedes the common law wherever applicable, it does not have the same purpose as in civil law countries. Common law judges view statutes as specific rules which are to be applied according to their terms, but not beyond.

Subject matter which falls outside the specific terms of the statute remain governed by the common law. Contrary to the civil law, common law systems do not intend that a code completely abolish all other law in a specific area. It is expected to perfect certain points and be supplemented by the existing case law.

Much like that of the United States, Mexico's governmental organization and power is separated into three branches (Executive, Legislative, and Judicial). The legislature is officially empowered to initiate legislation but in practice this power is delegated almost exclusively to the President.

In 1824, the drafters of Mexico's first Constitution following independence were greatly influenced by the United States Constitution of 1787. In 1857, during the political revolution known as *La Reforma*, liberal ideologies that intended to curtail the power of Catholic Church and special interest groups dominated the principles outlined in a new Constitution (Pereznieto, et al., 2004).

The Mexican Constitution of 1917, like its predecessors of 1824 and 1857, established the basic political structure of a republican and federal national government with three branches: an executive (popularly elected), a legislature (bicameral), and a judiciary (lifetime appointments for the Supreme Court), as well as separate state governments and a bill of rights.

This Constitution, which is still the current one, follows the traditional pattern expected from civil law judiciaries, with limited judicial interpretation and multiple incidences of amendments. The 1917 Constitution has been amended more than 400 times compared to twenty-seven amendments to the far older U.S. Constitution. The latter probably happened because judges intended only to apply legislatively enacted law to situations with which they are

confronted and are required to follow, as closely as possible, the legislative intent which inspired enactment of the code. Thus, the Constitution had to be modified to adapt to the ever-changing policies of each president and, changed economic and social norms in society.

This subsection includes the most relevant amendments for transportation planning activities.

Development of Economic and Social Rights

Mexican laws, as in most nations, are the result of the country's social and historical evolution. They represent responses to changing demands – of citizens, interest groups, and business – over the years, as well as being a consequence of economic and social needs.

The first chapter of the Mexican 1917 Constitution contains an enumeration of individual guaranties against the power of the government to restrict or infringe the liberty of individuals. This chapter may be called the bill of rights of the Mexican Constitution. In one important respect, it differs from the bill of rights contained in the Constitution of the United States (U.S.): whereas the first ten amendments to the Constitution of the U.S. apply exclusively to the federal government, the guaranties enumerated in the Mexican Constitution may be enforced against any and all governmental authorities, State or National (Baggett, 1965). Thus, the guaranties favor every inhabitant of the United Mexican States and may be enforced against any governmental authority.

Social rights can be viewed as belonging to one of two types (Pereznieto, et.al, 2004):

1. Rights that imply a clear commitment on the part of the state to grant material benefits
2. Rights that must be preserved by private citizens, such as worker rights that should be observed by employers or land owners

According to Noriega-Cantú (1985), these social rights have four essential characteristics:

1. They are concrete and have a specific content.
2. They outline the State's active intervention.
3. They are applicable only to the people.
4. They limit the people's individual rights to protect a higher social standard.

The 1917 Mexican Constitution is considered a *mélange* between classic individualist and liberal theories that dominated the 1857 Constitution, and the new social trends that emerged during World War I. It was the first Constitution that incorporated peasant's and worker's social rights (Fix-Zamudio, 1985). The core protections of the Constitution of 1857 were kept intact in the new 1917 Constitution, but in addition a group of social rights, among other natural rights, was added whose primary purpose was to remedy social inequalities.

The inclusion of such rights was the result of the institutional achievements of revolutionary ideals and aspirations that initiated Mexico's 1910 Revolution, and were a response to Porfirio Diaz's dictatorship (1876–1911) which favored unrestricted foreign investment in Mexico. For 35 years, Diaz had maintained relative peace built on an unstable foundation due to the lack of social and economic equality. Diaz was aided in this approach by the limitations of the 1857's Constitution which did not enumerate any safeguard for Mexican inhabitants to exercise their natural rights. Instead the 1857 Constitution focused only on

property and land rights and granted industry and labor great latitude in establishing a liberal economic regime (Madrid-Hurtado, 1992).

At first, the Founding Fathers of the 1917 Mexican Constitution conceived such social rights as a restraint on the ability of powerful individuals to act against the interest of the socially disadvantaged. The 1917 Constitution empowered the federal government to ban and punish monopolization of land, by dividing up privately held land and distributing it among landless members of common farmlands (*ejidos*) and, preventing imposition of unfair working conditions (Pereznieto, et al., 2004). Under the administration of Lázaro Cárdenas, the amount of agricultural land held by *ejidos* grew rapidly, from approximately 15% in 1930 to 47% by 1940 (Klooster, 2003) Significant land grants continued through the term of Echeverría Alvarez that terminated in 1976. In the latter years, however, many of the grants were of “marginal lands” not suitable for agricultural use. The Framers of the 1917 Constitution also included Article 27, which is an incipient attempt to include economic regulation, and article 123, which outlines the basic worker’s rights (Fix-Zamudio, 1985).

The 1917 changes led over time to the, the nationalization of many industries including petroleum, electrical, nuclear, banking and credit industries, and the establishment of the economic exclusive zone (EEZ) (*zona económica exclusiva*) (Fix-Zamudio, 1985). The EEZ recognized the potential importance of the sea for Mexico, establishing a 200 nautical miles zone from the coast to increase Mexico’s jurisdiction and avoid excessive or abusive marine resource exploitation. Also, the development of environmental protection regulations was progressively included in the Constitution.

Until 1982, the Mexican economy was heavily regulated and protected. Industries and services in many areas were shielded from foreign and national competition. The federal government operated thousands of enterprises in sectors ranging from hotels to transport and mining (OECD, 1999). Export played a limited role as most industries concentrated on internal markets.

In 1982, Mexico suffered a severe economic crisis, including monetary devaluations, inflation, unemployment rate increases, external debt crisis, and expropriation of the banking sector. According to Madrid-Hurtado, these factors framed the present Mexican economic regulation (Madrid-Hurtado, 1992) and led to changes in the Constitution. The same year (becoming effective on February 3, 1983), the Mexican Constitution was amended to shift from an inward-looking economy to an open and market-based economy. This recognition that a closed economy model had not worked for the country made Mexico one of the first Latin American countries to adopt market-based principles as a cornerstone of economic development (OECD, 1999). This correlated with the ascension of the market-oriented Miguel de la Madrid to the Presidency. Under the de la Madrid and Salinas administrations, most state-owned enterprises were sold and opportunities opened for national and foreign investment in infrastructure, including the development of toll roads.

According to Serra-Rojas, these amendments principally focused on:

- The state’s guidance for economic development
- Democratic planning of the national economic activity
- National economic development
- Criteria to attain social equity and productivity
- Social and private sectors activities

- Popular (consult) referendum
- Rural development
- Price politics
- National banking and credit services
- Priority activities
- Strategic areas

These amendments have led over the past 20 years to social and indicative planning through the NDP and its correspondent sectoral, institutional, regional, and special programs. These programs establish the state's responsibility to steer the development of the country and identify the particular projects it will undertake to this end (Fix-Zamudio, 1985).

1992 also saw Mexico enact new amendments to its federal Constitution to adapt to the new circumstances outlined by NAFTA. These rely on three main pillars: privatization of publicly owned companies, economic deregulation, and the establishment of a new legal regime for free market economy (Pereznieta, *et al.*, 2004).

Constitutional Planning Provisions

Placing Mexico in the context of Latin American economic philosophy of the post WWII era shows that the nationalist economic programs established by Mexico were similar to those adopted by other Latin American countries in that they were characterized by (Schiaffini-Aponte, 2006):

- Import substitution plans
- Absence of any long-range impact rules or public policies related to planning and development

Industrialization was seen as an end unto itself, while the economic competitiveness, efficiency, or sustainability of development was not given sustained attention. In the case of Mexico, these factors, combined with high trade barriers, produced widespread industrial inefficiency and private and public monopolies. However, Mexican aggregate economic indicators showed good performance for two decades under this strategy, as Mexico experienced rapid economic growth, financial stability, and relatively robust external accounts (OECD, 2000). Nevertheless, the 1950s and 60s limited planning actions are notable because their objectives mainly focused on increasing infrastructure planning, justifying external debt and regulating the extreme urbanization of certain Mexican cities by enacting zoning rules (Schiaffini-Aponte, 2006).

The limits to the import substitution strategy emerged in the early 1970s when the Mexican economy slowed. Lower growth rates led to an increase in government spending to address social inequalities, resulting in growing fiscal deficits. Fiscal policies were not sustainable and the government was forced to devalue the Peso in 1976. Despite a short-lived stabilization effort in 1977, the discovery of oil allowed the government to avoid a resolution of the underlying problems that led to the crisis (OECD, 2000).

With support from foreign borrowing, the government increasingly expanded into direct production of goods and services. As a result the state sector accounted for an increasing share of the economy, though it was characterized by poor planning and management, over-employment,

and widespread inefficiency (OECD, 2000). These policies, among others, were ultimately unsustainable thus provoking a debt crisis. In 1982, Mexico suffered a severe economic crisis: which ultimately framed the present Mexican economic regulation (Madrid-Hurtado, 1992) and led to relevant economic changes in the Constitution.

Although the 1917 Mexican Constitution was innovative, it did not include any wording in connection with economic principles. Mexican economic regulation reform actually began during the presidency of Miguel de la Madrid (1982–1988). Mexico's mixed market-state economy constitutes nowadays an intermediary system that is not totally market based or an extreme centrally planned economy (Serra-Rojas, 1996).

In 1983, the Mexican Congress enacted several amendments to the Constitution, their primary focus was to include the state's duty to guide the country's development, among others. The new text of Articles 25 and 26 of the Mexican Constitution broadly state and outline the following principles:

- “National development” can be understood as the increase of productive activity and the national capacity to create wealth and to distribute it in an equitable manner among the people (Rabasa & Caballero, 1996).
- The state shall guide the country's economy. This guidance shall be limited and should not oppose social or individual guarantees of the people.
- National development and planning must be complete, sustainable, include all sectors, strengthen the democratic regime, and allow full liberties so that anyone can compete and include everybody's participation.
- For the first time, the Constitution mentions three sectors: public, social, and private.
- The social sector includes the workers unions, cooperatives, rural communities, and the like.
- The public sector, through the federal government, shall have direct control over certain activities that are deemed as strategic by the Constitution: the state has exclusive powers to develop and direct the areas considered as strategic in Article 28 of the Constitution. The public sector can participate in the social and private spheres, in accordance with further regulation, to develop and organize national development through priority and strategic economic activities.
- The Constitution acknowledges the existence of the private sector and establishes that the Constitution shall support adequate conditions for private economic activity.
- National planning must be guided by the state; national planning must be democratic, so all social sectors should participate through popular consultation.
- The development plans should be an expression of the people's aspirations and demands.
- Development plans are mandatory for the federal Public Administration (*Administración Pública Federal*; FPA); all governmental agencies are required to carry out the programs in accordance to the national development plan.
- Development plans shall be made periodically. These development plans shall be drafted in accordance with the economic principles of Article 25 of the Constitution but integral development should be prioritized over mere economic growth.

- The Executive Branch shall coordinate through written agreements with state governments the development and execution of the plans.
- Although the Executive Branch is responsible for Mexico's planning activities, Congress has also a certain amount of control since it approves the annual budget (Orozco-Henriquez, 1985).

The planning scheme outlined by the federal Constitution is considered to be flexible or indicative (i.e., it should be a summary of responses to economic and social fundamental problems). The Constitution contains a strict definition regarding the boundaries between the social and public interests and their relation to the public sector.

Finally, it is important to note that these new economic regulations are considered to be unfortunately placed within the text of the Constitution since they were included in the Individual Guaranties chapter and do not constitute— technically— any natural right of the people vis-à-vis the government (Burgoa, 1996).

Property, Expropriation and Environmental Regulations

Controversies between the state and federal governments over the ownership of public lands at various periods following the independence of Mexico resulted in a great deal of confusion and uncertainty. Under the 1824 Constitution, the Republic was organized as a federation of independent and sovereign states, granting the federal government enumerated powers, and reserving to the States all powers not delegated to the federal government. The federal government was given no power with respect to public lands.¹⁷

The first paragraph of the 1917 Mexican Constitution defined the status of all national territory. It:

- Affirms that the state has exclusive powers to develop and direct the activities considered as strategic in Article 28 of the Constitution.
- Places lands under the National government jurisdiction.
- Declares that the ownership of all lands within the limits of the national territory is vested originally in the Nation.
- Declares further that the Nation has had and has the right to transmit title thereof to private persons, thus confirming all titles previously issued by the National government.

The original ownership of all lands (and waters) formula was a direct nationalistic response by the 1917 drafters to Diaz's generous concessions for foreigners over Mexican natural resources (Diaz y Diaz, 1994). The formula condenses a very rudimentary conception of sovereignty—it is an explanation of the relation between the State and property rights. Today states normally declare themselves sovereign over their lands and waters, although not

¹⁷ The lands that had not been previously alienated by the Spanish government became then property of several states. The law of August, 1824, recognized the states as the owners of such public lands (Baggett, 1965). The Constitution of 1857 was not very specific with respect to the powers of the federal government over public lands; the latter mentioned that it was within the Congress' powers to make rules for the occupation and alienation of public lands and to fix the prices thereof (Baggett, 1965). Nevertheless, the fact that this constitution did not expressly state whether public lands were property of the federal government or of the States created much controversy.

necessarily owners. Thus this article begins with a declaration that private persons receive their property rights from the state, a right that is subordinate to or conditional upon collective needs (Pereznieto, et al., 2004).

Article 27 also outlines the following principles:

- The state has exclusive powers to develop and direct the areas considered as strategic in Article 28 of the Constitution.
- Private property shall not be expropriated except for the reasons of public utility and by means of indemnification.
- The States, Federal District and Municipalities are fully capable to acquire and possess lands that are necessary for public services.
- The federal and states laws shall determine those cases in which the occupation of private property is to be considered of public utility, and in accordance with those laws, the administrative authorities shall make the corresponding declaration.
- The amount fixed as compensation for the expropriated property shall be based on the sum at which the property was valued for taxable or ratable (known as fiscal) purposes (*catastral* value).
- The increased value which the property may have acquired through improvements made subsequent to the date of fixing the fiscal value shall be the only matter subject to expert opinion and to judicial determination.
- The indemnity shall be at least simultaneous with the taking of the property.

Article 27 of the Mexican Constitution also clearly distinguishes between expropriation which, under Mexican law, consists of "legally taking a thing from its owner, for reasons of public utility, and giving the owner a fair indemnification," and limitations in the public interest, which do not require indemnification even though they may affect the value of property (Starner, 2002). The Mexican Supreme Court of Justice has explained that limitations constitute "a partial extinction of the rights of the owner," whereas expropriation amounts to the substitution of the right to use and ownership of the thing for the enjoyment of the indemnity.

Limitations that do not require indemnification must be generally applicable, rather than specifically directed at an identified piece of property, and must remove only limited attributes of the owner's right to the property, rather than transferring ownership of the property to the state.

In the case of expropriation, Article 27 of the current Constitution sets forth the principle of inviolability of property by providing that private property may be taken only for public purposes and by means of certain formalities which must be strictly complied with. These provisions refer only to the taking of private property by the exercise of eminent domain. The federal government is vested with the power to make expropriation in connection with any property or enterprise within the jurisdiction of the federal government; whereas the states are vested with the power to make expropriations in connection with property within their jurisdiction. The federal government can also make expropriations of property within the confines of the states.

The Constitution directs that the federal and state laws shall determine within their respective jurisdictions those cases in which the occupation of private property is to be considered a public utility. The 1917 Constitution requires further administrative steps to be

undertaken including (i) the existence of a law that determines the generic cases in which the expropriation of land should be considered a public utility and, (ii) an administrative declaration in the particular case declaring that the expropriation is of public utility within the terms of the law.

Compared with the U.S. Fourteenth Amendment, that added the requirement of just compensation for state and local government eminent domain takings, Mexican expropriation indemnity is solely valued in the fiscal value of property. The latter has been an important source of social conflict, since the *catastral* value is, in most cases, a considerably lower estimation than the market value of the lands. Another major difference between eminent domain regulations in both countries is that U.S. regulation provides that if the owner is not satisfied, they may sue the governmental agency for a court's determination of just compensation (although the government becomes owner while a trial is pending, if the amount of the offer is deposited in a trust account). In Mexico the only matter that a trial can review is the increased value which the property may have acquired through improvements made after the date of fixing the fiscal value.

Also within Article 27's abundant content are instructions establishing the federal government's obligation to conserve the nation's natural resources.

Strategic and Priority Activities

Investment in the public sector should always aim to fulfill a country's social and economic needs. Social investment will usually be spent in health, housing, and education, whereas economic investment is normally intended to develop internal communications, ports and air transportation, energy plants and basic industries (Gamiz-Parral, 2000).

As a general principle, the 1917 Constitution forbids monopolies. Nevertheless, certain strategic and priority activities are exempted from this provision and are not considered monopolies. Article 28 of the Mexican Constitution deals, among other things, with the classification of strategic and priority activities in connection with the state's intervention in the economy.

Strategic activities are carried out solely by the federal government (as instructed in Article 25 of the Constitution). They are mail, telegraph and radiotelegraph services, petrochemicals, radioactive minerals, and nuclear and electrical power generation. Article 28 does not limit future possibilities to expand the state's exclusivity in certain economic activities (Ruiz-Dueñas, 1985). The designation 'strategic' implies an absolute exclusion of private investment or individuals from carrying out the latter activities (Pereznieto, et al., 2004).

Priority activities can be understood as a category where the government may solely or jointly, together with private investors or with the social sector, carry out certain economic activities, thus reaffirming the mixed market-state principles aforementioned. For the purposes of this technical memorandum, we will focus in the cases where the state may, through joint ventures or concessions, develop certain economic sectors.

In the first case, the state may take part in joint ventures with private individuals or companies to carry out such economic activities under different types of association; in the second case, a private enterprise may carry out the priority activity under a concession granted by the government where the latter will seek to grant subsidies and incentives and also monitor the services rendered (Pereznieto, et al., 2004).

In the past, when ex-president Miguel de la Madrid (1982–1988) inherited the leadership of a bankrupt government, the parastatal sector in Mexico accounted for up to 1,155 entities

(Pereznieto, et al., 2004). Entities in primary activities such as airlines, hotels, railroads, shipping companies, and PEMEX, the petroleum monopoly, were owned and managed by the state.

Nevertheless, in recent years, Congress has amended Article 28 to reduce the number of strategic areas. The most relevant amendment for the transportation sector was published in March 2, 1995-railroad development and management passed to be classified from a strategic to a priority activity therefore making possible private concessions in this activity. The Executive Branch mainly based the amendment on the following arguments:

- Social and economic changes have modified the paradigms by which the railroad services were considered as a strategic activity to be rendered solely by the federal government.
- The scarcity of public funds makes the government unable to invest in this activity that urgently needs to be modernized to promote economic development in the country.
- The access of the private sector to economic development through work, technology, and investment will translate into more availability of government's actions and funds to other basic objectives.
- At present, state control in this industry has proved to be inefficient. The laws shall guarantee that the relevant authorities may regulate and supervise the railroad's industry modernization and development.

Applicable Laws for Transportation Infrastructure Planning

To understand Mexican transportation planning activities it is important to review several principles and laws; planning activities are currently scattered among many regulations, making its correlation a difficult task. Mexico's transportation planning is complex because of the over-involvement at the state and federal levels and the lack of established planning processes at the municipality level due to political, technical, and budget limitations (Barton-Aschman/La Empresa, 1997).

The gradual dismantlement of legal barriers used in past decades to inhibit foreign and private investment in transport infrastructure has modified transport planning in Mexico. Currently, planning activities intend to increase private and foreign participation in the sector.

Coordination and Concurrence of the Federal, State and Municipal levels

In order to understand the coordination system in Mexico, it is important to first examine the Mexican legal hierarchy (Table A1). This table is consistent with legal ordering in the classical civil law order: legislation is the most important and only true source of law. Nevertheless, there is a misconception in the U.S. that adherence to established precedent (*stare decisis*) plays no role or only a minimal role in the Mexican legal system (Pereznieto, et al, 2004). However, even if *stare decisis* is not as widely used as in the U.S., judges and administrative tribunals routinely adopt or follow, as a formal or informal source of law, previous decisions.

As for concurrence, under the Mexican Constitution, certain matters are assigned exclusively to the federal government and some others exclusively to the states. In a number of important areas, the states and federal government share jurisdiction to legislate (Pereznieto, et al, 2004). Transportation planning and legislation fits under the latter case.

Table A1: Comparative Legal Hierarchy (U.S. and Mexico)

Legal Hierarchy in Federal Matters	Legal Hierarchy in State Matters	U.S. Legislation
Mexican Constitution	Mexican Constitution	U.S. Constitution
[International treaties]	Federal regulatory laws, codes, and treaties	Treaties, federal statutes
federal regulatory laws, codes, and treaties	State Constitution	federal executive orders, rules, and regulations
federal ordinary laws	State regulatory laws and codes	State constitutions
federal regulations	State ordinary laws	State statutes
federal jurisprudence, federal administrative rulings	State regulations	State administrative rules and regulations
Doctrine, custom, general principles of law, equity	Municipal laws	Municipal charters, ordinances, rules, and regulations
federal regulatory laws, codes, and treaties	State jurisprudence, state administrative rulings	
federal ordinary laws	Doctrine, custom, general principles of law, equity	

Source: Perezniето, *et al.*, 2004.

Mexico has legislative concurrence in transportation issues; therefore, applicable transportation laws may be enacted by the Federation through Congress (*Congreso de la Unión*), as well as by state legislatures. As a result, the transportation sector may be regulated in a state by federal laws as well as state laws; the latter normally address local problems (Centro de Estudios Sociales y de Opinión Pública, 2006).

Table A2: Intergovernmental Division of Powers in Mexico

Public Service	Management and Current Expenditures	Investment and Capital Expenditures
Urban Planning		
Land Use Control	M	
Tenure regulation	M	
Transport		
Urban Transport	F, S, FD	F, S, FD
Urban Roads	M	M
Highways	F, S	F, S
Turnpike Motorways	F, S	F, S
Railways	F	F

Key: F = Federal; S = State; M = Municipal; DF is the Federal District

Source: OECD, 1999.

Planning Law, National Development Plans, and State Transportation Planning

The first Mexican Planning Law (*Ley Sobre Planeación General de la República*) was enacted in July, 1930, during Ortiz-Rubio's presidential period (1930–1932). This first document's intention was to harmonize and coordinate the country's development in accordance with its "typography, climate, population, history, and present and future social and economic needs."

It required the creation of a National Plan (*Plan Nacional de México*) and established the National Planning Commission (*Comisión Nacional de Planeación*). In compliance with these requirements, the first Presidential Plan (*Plan Sexenal*) was drafted and applied during Cardenas' presidential mandate (1934–1940).

Before the 1980s, several irregular planning documents and agencies took care of this task. For example, during Aleman's presidential period (1946–1952), a National Investment Commission (*Comisión Nacional de Inversiones*) was created, to then disappear during Ruiz-Cortinez' stint (1952–1958) and reappear under the name of Investment Committee (*Comité de Inversiones*) and afterwards changing its name to Investment Commission (*Comisión de Inversiones*) (Schiaffini-Aponte, 2006). The commission's faculties were eventually absorbed by the Presidential Secretariat (*Secretaría de la Presidencia*) during Lopez-Mateos' 6 year mandate. With all these and other changes, the Presidential Plans during this period and until the early 80s were somewhat irregular in their content and duration (Schiaffini-Aponte, 2006).

With the 1982 constitutional amendments to Articles 25 and 26, planning regulation suffered dramatic changes. In January 5, 1983, a new Planning Law was enacted. Its most relevant rules, as amended, provide:

- The creation of a National Democratic Planning System (*Sistema Nacional de Planeación Democrática*). The PFA configures such system through special administrative units that will solely have planning functions and will be coordinated by the federal Executive Branch via the Treasury and Public Credit Secretariat (*Secretaría de Hacienda y Crédito Público, SHCP*)
- The National Democratic Planning System has four different moments: creation, execution, control and evaluation (Ordaz & Saldana, 2006)
- NDPs shall cover a 6 year period (which is the length of the Mexican presidential mandate, with no possibility of reelection). Nevertheless, they can include certain long term projections and considerations. NPDs are drafted during the first year and usually consist of a 5-year plan issued in the second year of such term of office (Pereznieto, et al., 2004)
- NDPs shall reflect the proposals from the PFA's agencies and parastatal entities, state governments, interested social groups and indigenous communities
- NDPs will draw the boundaries by which annual sectoral, institutional, regional, and special plans should be prepared:
 - (i) Sectoral plans are to be created by each PFA agency and shall solely address the objectives, priorities, and policies related to their targets
 - (ii) Institutional plans are prepared by the parastatal entities, in compliance with their correspondent sectoral program

- (iii) Regional plans shall target special regions considered to have priority and strategic values; its territory may go beyond one state's jurisdiction
- (iv) Special plans will focus on certain issues deemed as priorities to the development of the country or to the activities that will need the coordination of two or more agencies of a specific sector
- The President shall deliver the NPD for the Congress' exam and opinion. In March, the President and the Secretaries of State are also required to present a status report regarding the implementation and compliance of the NPD.

The Planning Law also outlines, according to Chapoy-Bonifaz (2003), four main principles:

- Mandatory implementation: all PFA's agencies and parastatal entities are required to carry out the NDPs' objectives. Sectoral and institutional plans derive from this principle
- Coordinated implementation: the Federation, states, municipalities and their respective agencies shall comply with the NDP
- Public, private, and social sectors implementation: public agencies shall negotiate with private enterprises and social groups to achieve the PND's objectives
- Rule-related implementation: design and implementation of law applicable to different fields (budgetary, tax, monetary, that will create favorable conditions for the execution of NDPs

It is important to note that under these principles, all the states and municipalities create their own development plans in accordance with the NDP. Although compelled to do so, the percentage of municipalities that have a well-established development plan is 81% of urban areas and 74% in rural areas (INDESOL-INEGI, 2000)

Article 16 of the Planning Law compels all federal administrative agencies, including the SCT, to create sectoral programs that involve state governments as well as interested social groups. Article 32 of the aforementioned law establishes that the coordination and execution of the sectoral plans, as well as programs, must be submitted for the States approval in accordance with the respective coordination agreements.

State governments and municipalities take part in the NDP's design by means of coordination agreements executed between them and the federal Executive which describe joint actions between both public entities (Cento de Estudios Sociales y de Opinión Pública, 2006).

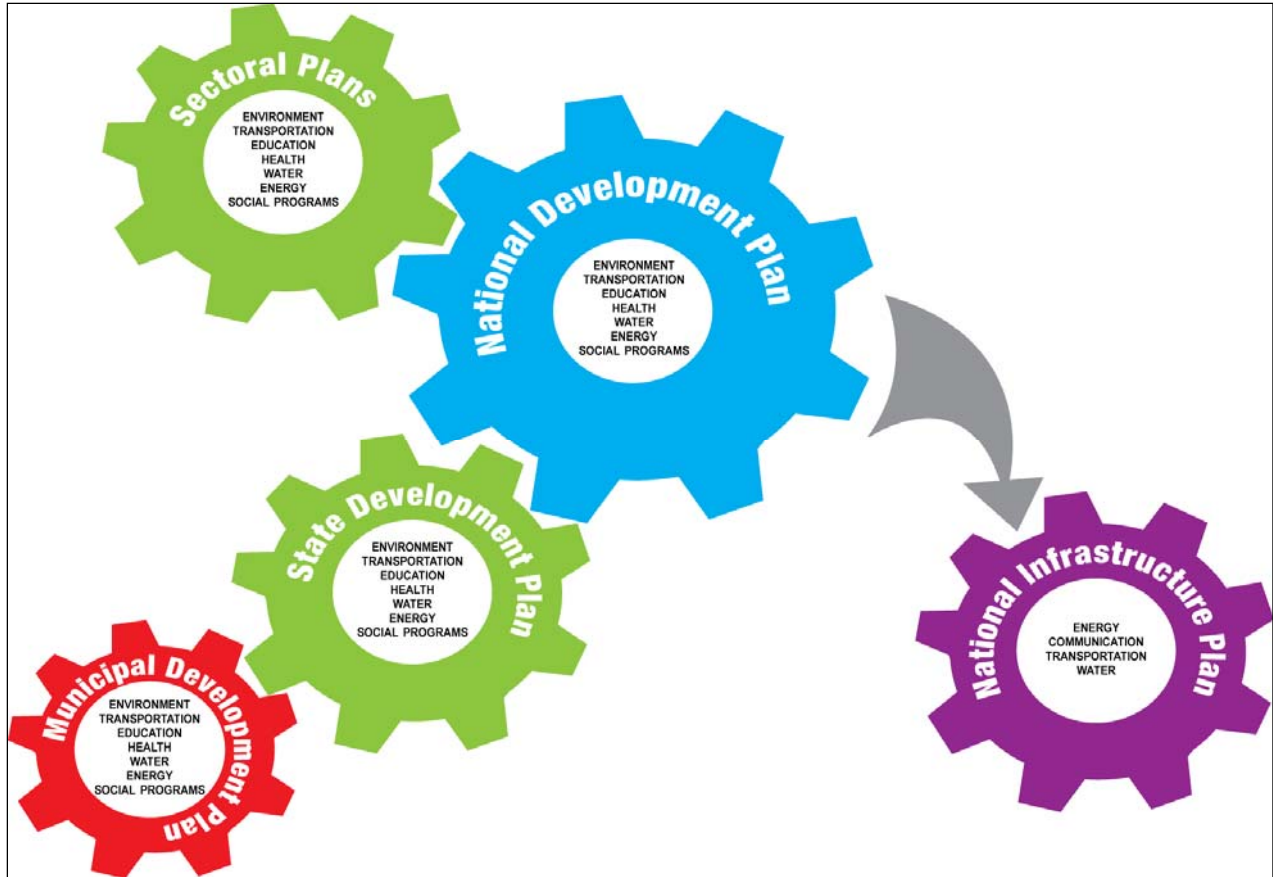


Figure A1: Jurisdictional Intersection of Transportation Plans in Mexico

Coordination of Federal, State and Municipal development plans

Transportation planning has been present in several PNDs. For example, President de la Madrid’s (1982–1986) PND addressed four major issues: political, economic and social, sectoral and regional. As for transportation planning, it only mentions the intention to achieve internal integration, enhancing its productive system and improving service (Schiaffini-Aponte, 2006).

President Salinas’ (1988–1994) PND was drafted with NAFTA in mind; thus, neoliberal economic policies prevailed. This plan emphasized Mexican economic modernization through the development of productive farming, infrastructure, telecommunications, and tourism, among other elements (Schiaffini-Aponte, 2006). At the end of 1994, not even a year after NAFTA was implemented, Mexico was hit by a severe economic crisis. Although the economy was much more open and competitive, many small companies went bankrupt, and poverty, unemployment rates, and unequal distribution of income increased drastically (Pereznieta, et al., 2004).

Thus, in a scenario of a more demanding Mexican society, avid of new transparency requirements, President Zedillo (1994–2000)—who also embraced the neoliberal economics of Salinas—introduced the concept of “strategic planning.” This encourages an active role of the agency or entity and the results of the process, which translates into a thorough analysis of the tasks, objectives, and the strategies to satisfy the needs of the people in a specific time frame (Schiaffini-Aponte, 2006). Notwithstanding this new approach, Zedillo’s NDP primarily focused on social and environmental issues. At the end of his mandate, Congress approved the creation of

a Commission on Regulatory Improvement (*Comisión Federal de Mejora Regulatoria*). Bids for concessions to operate transportation infrastructure were a key characteristic of the Zedillo administration. In 1995, the SCT put forward bids for private concessions to operate four major ports: Altamira, Veracruz, Manzanillo, and Lázaro Cárdenas (Sourcemex, 1995(a)). This was followed by the granting of a concession to operate the multi-use port of Ensenada in 1997. The Zedillo administration also solidified the privatization plan for Mexico's national railway system in 1995 (Sourcemex, 1995(b)). Partial privatization of thirty-five air terminals was announced in 1998 with direct and indirect foreign ownership limited to 49% of total shares (Sourcemex, 1998).

Vicente Fox (2000–2006) of the National Action Party (*Partido Acción Nacional*, PAN) was elected president in July 2000 in what were widely considered the freest and fairest elections in Mexico's history (U.S. Department of State, 2007). His victory ended the Institutional Revolutionary Party's (*Partido Revolucionario Institucional*; PRI) 71-year hold on the presidency. Fox's NDP stated that a competitive offer of communications and transportation services was essential to support Mexico's economic competitiveness, therefore deeming as necessary infrastructure expansion with alternative financing schemes (SCT, 2001).

Expropriation: limitations and restrictions on private property rights and foreign investment

Historically, Mexico has always distinguished between domestic property and foreign investments, emphasizing Mexican sovereignty and independence from foreign economic control (Starner, 2002). During Porfirio Díaz's administration, foreign investors owned more than half the country's total wealth, fueling the Mexican Revolution of 1910 (Starner, 2002).

The 1917 Mexican Constitution embodies independence from foreign economic or political control. The Constitution established a framework for an interventionist state and reserved to the government exclusive control over foreign investment: this was reflected in both Mexico's pre-NAFTA regulation of property and foreign investment.

Article 27 of the Mexican Constitution is the foundation for the government's authority to regulate property. According to Article 27, the Mexican government has broad authority to regulate and to expropriate private property for "public utility" matters. In domestic application, the government has exercised wide discretion in regulating property (Starner, 2002). Mexican courts have held that regulations that do not remove all of the owner's rights to property do not constitute a taking and are not entitled to compensation.

In 1936, the Expropriation Law (*Ley de Expropiación*) was enacted. Among other things, it provides that:

- The establishment or the enlargement of streets, roadways, bridges, highways and tunnels is considered a public utility cause.
- The embellishment, enlargement and renovations of ports, airports and any other works performed to render services in the benefit of the people is considered a public utility cause.
- In the case of temporary occupation or limitation of domain the indemnification will be determined by experts.

It is important to note that Article 27 of the Mexican Constitution and the Expropriation Law were drafted with the "Calvo Doctrine" in mind. Under this doctrine, the Mexican

government may grant ownership rights to foreigners only if they agree to consider themselves nationals with respect to the law governing the property and agree to abstain from the protection of their governments. According to Starner (2002), the Calvo Doctrine encompasses three basic concepts:

- The requirement of absolute equality of the treatment of aliens with the treatment of nationals, meaning that aliens have recourse solely to domestic law remedies.
- The policy of nonintervention of the alien's state of nationality in the event of a dispute.
- The prohibition of foreign states from intervening, diplomatically or otherwise, to enforce its citizen's rights in the face of the nationalization of their property.

The Mexican government legally justified its actions by asserting the Calvo Doctrine, pursuant to which a government may nationalize or expropriate any foreign investment according to domestic law (which may not require compensation), rather than international norms.

The most dramatic applications of Mexico's pre-NAFTA foreign investment policy and the Calvo Doctrine came with the expropriation of foreign mining concessions in 1937 and the nationalization of U.S. and British owned oil companies in 1938. The U.S. and British governments asserted that traditional principles of international law required Mexico to pay the foreign investors prompt, adequate, and effective compensation.

The Mexican government refused to pay, claiming that expropriation was within Mexico's rights as a sovereign nation. The Mexican government legally justified its actions by asserting the Calvo Doctrine rather than international norms. There have been virtually no expropriations of foreign owned property, with or without compensation, since 1938 (Pereznieta, et al., 2004).

On March 9, 1973, Mexico enacted a new foreign investment regulation (*Ley para promover la Inversion Mexicana y Regular la Inversion Extranjera*— Law to Promote Mexican Investment and Regulate Foreign Investment). The essential posture of the regulation towards foreign investment was hostile, giving the government authority to regulate foreign property interests; it established a rigid system of regulation over foreign investment. The investment regulation prohibited majority ownership by foreign entities in many economic activities and designated many sectors entirely off limits to foreign investment.

On December 27, 1993, President Salinas enacted the Foreign Investment Law (*Ley de Inversión Extranjera*), suggesting a significant move towards a more liberal foreign investment regime in light of Mexico's future obligations under NAFTA. The latter opened new areas of investment to foreigners including certain sectors of the oil and automobile industries; the strict percentage ownership rules were eliminated (Villarreal, 2005). It also provides that any foreign investor may invest in the shares of a Mexican enterprise, acquire the assets of a Mexican company, establish a new business in Mexico, or expand its current business, subject to certain restrictions (Villarreal, 2005).

The Expropriation Law underwent major amendments in 1993, before NAFTA came into force. These mainly modified the government's expropriation procedures as well as providing new indemnification rules:

- The price paid by the government in case of expropriation shall be a value set in between the *catastral* and the commercial value.
- The price shall be paid within a year after the expropriation decree was published.

Environmental Regulation

Unlike the United States, Mexico is relatively new at government led environmental protection efforts. Although there were some meager efforts in the late 70s and early 80s to protect Mexico's environment, they mostly focused on air pollution issues in the Mexico City area.

The 1983–1988 Development Plan provided, for the first time, that “environmental issues were directly related to the social and economic development of the country” (Centro de Estudios Sociales y de Opinión Pública, 2006). Therefore, in 1987 Articles 27 and 73 of the Constitution were amended to establish the Executive's obligation to take the necessary precautions to maintain ecological equilibrium, as well as to enable Congress to legislate in federal environmental matters.

The General Law of Ecological Equilibrium and Environmental Protection (*Ley General de Equilibrio Ecológico y la Protección al Medio Ambiente*, LGEEPA) is the general regulatory body pertaining to ecology and the environment in Mexico. The latter was enacted in 1988, nearly 20 years later than the United States Environmental Protection Agency (EPA) was created (1970).

LGEEPA's goal is to protect and preserve the environment in Mexico's territory, its sovereignty, and its jurisdictions. Another function of LGEEPA is to ration the exploitation of the natural elements in such a manner that the economic benefits are proportional to the ecosystem equilibrium. It also aims to define the principles of environmental policy and to regulate the instruments of its enforcement. The content of the law is summarized into four basic areas: ecological policy, natural resources management, environmental protection and social participation, and security measures and sanctions.

In 1982, Mexico created the Secretariat of Urban Development and Ecology (*Secretaría de Desarrollo Urbano y Ecología*, SEDUE). The Secretariat of Social Development (*Secretaría de Desarrollo Social*, SEDESOL) replaced SEDUE in 1992. Then, in December 1994, President Zedillo combined the National Ecology Institute (*Instituto Nacional de Ecología*, INE), responsible for environmental studies, with the office of the Attorney General for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*, PROFEPA), responsible for enforcement, to form a new cabinet-level Secretariat for the Environment, Natural Resources, and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca*, SEMARNAT).

In Mexico, each state may enact its own environmental laws but their standards may not be lower than government established standards. LGEEPA's Article 11 instructs federal, state, and local governments to enter into agreements so that local authorities assume federal responsibilities; thus, state or municipal authorities may be effective environmental law enforcers.

The goal of effective coordination and decentralization has been elusive however (Perezniето, et al, 2004). The uneven distribution of governmental resources between the federal and state level has meant that many states lack the infrastructure and expertise required to undertake effective environmental monitoring and develop environmental regulation, even though SEMARNAT has delegations in each state (Perezniето, et al, 2004).

Mexico's environmental law is, in many respects, as stringent as United States environmental law, if not more so (Hardberger, 1993). Although the environmental laws of the United States and Mexico have been described as similar, differences exist particularly in enforcement procedures and administrative structures. When comparing Mexico and United

States environmental laws and enforcement systems, it is important to recognize that the legal systems and administrative frameworks of the two countries are fundamentally distinct.

While Mexico operates under a civil law tradition, the United States follows a common law tradition. Thus, under the Mexican legal system, administrative bodies are responsible for enforcement of environmental laws and dispute resolution. Mexico's traditional reliance on administrative proceedings to interpret and enforce the law contrasts to the common-law system's reliance on judicial precedent in administering its laws (Hanna, 1996).

In the U.S., if a court renders judgment in an environmental case, that precedent will play a vital role in determining how future courts and administrative agencies will resolve similar environmental issues. In Mexico, however, prior similar action by an administrative body or court does not affect subsequent administrative actions.

Another key difference between the United States and Mexican legal systems is the traditional lack of environmental law enforcement by the Mexican government (Hanna, 1996). The LGEEPA has little effect because of virtually nonexistent enforcement mechanisms. Weak enforcement is due primarily to the inadequate funding of environmental programs in Mexico (Hanna, 1996). Although the LGEEPA is capable of being as effective as U.S. environmental regulation, Mexico has lacked the personnel and funding to provide adequate enforcement (Peters, 2006).

Another area where Mexican environmental law is more stringent than its U.S. counterpart is in the requirement for environmental-impact appraisals (Hardberger, 1993). Whereas the United States generally does not require impact assessments for state, municipal, or private activities that do not utilize federal money, LGEEPA's Article 28 requires impact statements for both public and private projects before operations are permitted. These impact statements are compulsory for any hydraulic, petroleum, and communications projects, among many others.

Mexico has taken steps to maintain high levels of environmental protection by amending LGEEPA in 1996 and 2005. The amendments are premised on a new environmental policy based on the principle of sustainable development (Dye, 2003). They provide for greater specificity for the conduct of environmental impact statements of private activities and increased sanctions for recidivism.

An environmental impact evaluation, generally, is a detailed statement discussing the environmental impact of a proposed project and any alternatives to the proposed action. The United States' National Environmental Policy Act (NEPA) requires an environmental impact statement only for major federal actions that could adversely affect the environment (Dye, 2003).

According to Article 5, section B of a LGEEPA's regulation related to environmental impact evaluations (*Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Evaluación del Impacto Ambiental*) SEMARNAT is in charge to perform an environmental impact before any airport, highway, port, or railway project starts. Any damage to natural protected areas, woods, rainforest, arid vegetation areas, ecosystems, or national waters will be evaluated. Although some exceptions might be applicable (maintenance, previous authorization, or objective data demonstrating there is no environmental impact) the latter are very narrow. Before any project starts, the applicable documentation must be filed at the SEMARNATs offices.

In accordance to these requirements, SCT's Norms for Transportations Infrastructure (*Normativa para la Infraestructura del Transporte*), Books 14 though 17, provide that a detailed study evaluating any environmental impact should be executed before the commencement of any

project carried out or commissioned by the SCT. As well, Books 22 through 25 provide that while the execution of the project takes place, a supervision body shall evaluate the environmental impact of the latter, as well as all the measures that have been taken to mitigate any environmental impact of any project carried out or commissioned by SCT.

Concessions Regime

One of the most frequently used methods for infrastructure financing in Mexico is the Build-Operate-Transfer (BOT) public private partnership (PPP) model, especially in the transportation, sector. The BOT model has allowed Mexico to expand privatization programs. It allows private investment capital to play a substantial role in infrastructure financing and, thereby, takes financial pressure off the government to construct much needed social and environmental infrastructure (Eaton, 1997).

Under the BOT model, private companies secure an exclusive license from the government to collect revenue and construct, control and operate a project for a fixed time frame (Eaton, 1997). After the established time frame, the facility and its assets are transferred back to Mexican authorities. Principally due to political reasons, the facilities are transferred back to the government after the set time frame.

The BOT scheme grants investors a stable legal environment and offers protection through a limited duration partnership with the government (concession). It also grants the private investor high levels of control over the construction and operation of the project during the life of the concession. Finally, the BOT method offers the host government the ability to finance much needed social infrastructure while maintaining politically acceptable levels of control over vital infrastructure projects (Eaton, 1997).

Although 'concession' as a concept has not been expressly defined by Mexican legislation, it can be understood as the exploitation by particulars of the leverage of a public service or good that belong to the State (Pérez de León, 1997). Additionally, a concession can be considered as a contractual right granted by the government (can be central, state, or municipal) to a private operator to construct and operate facilities which provide a service to the public (Mates, 1996) There are two types of concessions in Mexico:

- ones aimed to grant the use of federal goods pertaining to the Federation, States, or Municipalities
- ones aimed to grant the use of public services

As mentioned earlier, the federal Constitution provides that strategic areas activities may be carried out solely by the federal government with absolute exclusion of private investment and priority areas activities may be carried out by the government in conjunction with private investors through concessions. Articles 25, 27, and 28 outline general principles that create the Mexican concession's regime:

- The state may grant the exploitation, use or leverage of the nation's goods or as public services through a concession and only in public interest matters.
- Concessions may only be granted to private individuals or Mexican entities, except in the case of strategic area activities, The Constitution does not set any restriction regarding the nationality of individuals, thus, each particular law shall establish if there a limitation for foreigners exists for that particular activity (except for a nationality restrictions for concessions over waters and mining).

- Concessions shall be granted only in accordance with the rules and conditions set forth in the specific regulatory bodies of each activity to avoid specific antitrust monopolies in each activity.
- Private sector may participate in national development. Nevertheless, as stated before, the state is precluded from granting concessions for provision of public services in strategic areas to private individuals, and such services must be provided by the state.
- In the case of priority areas, concessions for provision of public services may be awarded if the law so permits and private individuals will have access to any supports, such as subsidies or incentives that may be applicable (Pereznieta, *et al.*, 2004).
- In areas of public services, other than strategic or priority areas, services may be provided by the state or awarded to private individuals in concessions (Pereznieta, *et al.*, 2004).
- Unless prohibited by law or the Constitution (like for example electric power, petroleum) a public service may be provided either directly by the government, or by the government granting a concession to a private individual or entity.

In most cases a specific law provides for the possibility of awarding a concession of a public service to a private individual until that specific administrative authority decides to avail itself of such an option. In sum, the sources of authority to grant a concession are the Constitution, the applicable privatization and sector-specific concession regulations. Nevertheless, other non-legal factors also enter into the equation, such as, political opposition groups (opponents of privatization in general), opponents of the party in power, or opponents of a particular project (environmental or cultural concerns) (Mates, 1996). Concessions can fall into two categories according to the financial risk:

Table A3: Categories of Financial Risk for Transportation Projects & Concessions

Quasi-Monopolies (may involve strategic and military considerations)	Competitive (market competition: self-sustaining economic viability contingent on traffic flow)
<u>Airports</u> : generally one civilian airport in any major urban area; often one international airport in emerging market countries	<u>Toll Roads</u> : must be granted long enough for economic payback at a reasonable tariff
<u>Seaports</u> : generally a natural, geographic monopoly; limited number of potential customers	<u>Railroads</u> : must be granted long enough for economic payback at a reasonable tariff

Source: Mates, 1996.

In the case of the SCT, transport concessions are governed by federal laws such as the Law of Roads, Bridges and Federal Motor Transportation (*Ley de Caminos, Puentes y Autotransporte Federal*, Law of Roads), the Railway Service Law (*Ley Reglamentaria del Servicio Ferroviario*, Railway Law), Airports Law (*Ley de Aeropuertos*) and the Ports Law (*Ley de Puertos*) stating different requirements and lengths for concessions to be granted.

In all four cases, there must be a concession application and a public tender process (although some exceptions exist). The SCT will have a term of 10 business days or more

depending on the term published, to grant the concession, after the date of the tender period concludes provided all the requisite information has been furnished.

In the case of the above mentioned laws, the term of a concession or assignment may not generally exceed 50 years (30 for roads). This may be extended for the same term, provided the concession holder has not incurred any infringement(s), which may result in the cancellation of the concession. Generally, these concessions may be suspended in case of failure to comply with the terms and conditions of the concession, among other causes. The suspension may be lifted when the said breaches are cured.

Concessions terminate due to (i) expiration of the term, (ii) revocation because it has already been suspended for the same breach, or failure to pay fees, provided it has been previously suspended for the same breach, transferring or assignment of the concession, breach of the law, provided it has been previously suspended for the same breach and a penalty imposed; (iii) lapse due to failure to use the concession; (iv) “recovery” of the concession due to public interest, with the payment of an indemnification to be determined by experts; or (v) court resolution.

It is also important to note that the past two decades have been characterized by an enormous effort by the federal government to decentralize certain public services, and requiring municipalities to be in charge of providing public services. This effort commenced in the 80s through an amendment to the Mexican Constitution.

While article 115, section III, subsection (g) of the Mexican Constitution provides that the Municipalities shall be in charge of providing the public service of roads and parks, municipalities lack the corresponding legislative authority to implement these obligations. State governments may assist municipalities in rendering such services only when the municipalities are unable to provide such services (Ramos-Miranda, 2003).

However, in order to comply with this constitutional mandate, municipalities depend, ultimately, on the state legislatures to issue legislation and guidance allowing them to create administrative rules (and other schemes) to issue procurement requests for such services. Municipal Codes generally lack sufficient provisions and clarity to guide municipalities in the rendering of this public service. This has a knock-on effect of limiting the possibility for the private sector to participate in such activities whether through concessions or service contracts (Ramos –Miranda, 2003). Unfortunately, most state legislatures have not correctly addressed the issue and therefore have not provided sound bases for municipalities to render these services, nor allow the private sector to actively participate. As a result, although municipalities do not have complete independence from state government to provide these services, many have opted to create their own rules regarding the procurement of public services.

If the private sector is considering investing in concessions or public private partnerships they will review this often contradictory legal landscape. While they may be at ease with the municipal rules and legal background, they may raise concerns, or not proceed with a project, because of the contradictions and the constitutional legality of any legislation vis-à-vis the relationship with state and federal legislation.

Table A4 shows a general overview of the concession regime for municipal public services and non-federal infrastructure of all Mexican states (the Federal District has different regulations). It is important to note that in all the states, except Jalisco, the municipal executive government (*ayuntamiento*) can grant concessions according to their Organic Municipal Laws (Ochoa Salas, 2000). In all the states, except Sinaloa and Tabasco, municipalities have the right to grant concessions for the public services of roads and parks (Ochoa Salas, 2000). If the local

congress's authorization is required, most of the cases include a grace period whereby congress' authorization is only required if the concession is granted for a period that exceeds the municipal's executive government (*ayuntamiento*) term limit.

Table A4: Concession regime for Municipal Public Services in Mexico

State	State's Constitutional Authorization	Procedure to Grant	Term	Renewable	Needs local Congress' authorization
Aguascalientes	No	Direct	No	Yes	Yes
Baja California	No	Direct	Yes	No	Yes (GP)
Baja California Sur	Yes	Direct	No	No	Yes (GP)
Campeche	Yes	Tender	Yes	Yes	Yes (GP)
Coahuila	Yes	Tender	No	Yes	No
Colima	Yes	Direct	No	Yes	Yes
Chiapas	Yes	Direct	Yes	Yes	No
Chihuahua	Yes	Tender	Yes	Yes	No
Durango	No	Tender	No	No	Yes (GP)
Guanajuato	Yes	Tender	No	No	Yes (GP)
Guerrero	Yes	Tender	Yes	Yes	Yes (GP)
Hidalgo	No	Direct	No	No	Yes (GP)
Jalisco	Yes	Direct	No	No	Yes
Mexico	No	Tender	No	Yes	Yes (GP)
Michoacán	Yes	Direct	No	No	Yes (GP)
Morelos	No	Tender	Yes	Yes	Yes (GP)
Nayarit	No	Direct	No	No	Yes (GP)
Nuevo León	Yes	Tender	Yes	Yes	No
Oaxaca	No	Direct	No	Yes	Yes
Puebla	Yes	No regulation	No regulation	No regulation	No regulation
Queretaro	Yes	Direct	No	Yes	Yes
Quintana Roo	Yes	Tender	No	No	Yes
San Luis Potosí	Yes	Direct	Yes	Yes	Yes
Sinaloa	Yes	Direct	No	No	Yes (GP)
Sonora	Yes	Tender	No	Yes	No
Tabasco	Yes	Direct	Yes	Yes	Yes (GP)
Tamaulipas	No	Tender	Yes	Yes	Yes
Tlaxcala	No	Direct	Yes	No	Yes (GP)
Veracruz	Yes	Direct	Yes	Yes	Yes (GP)
Yucatan	No	Direct	Yes	Yes	Yes (GP)
Zacatecas	No	Direct	Yes	Yes	Yes (GP)

Source: Banobras & Nafin, 2000

Agencies Involved in Transportation Planning in the National and International Arena

Effective regulation, competitive and efficient tender, and bidding processes for concessions, as well as clear planning mechanisms for the development of transportation infrastructure in Mexico, are important factors influencing the attractiveness of the country to foreign investors, and consequently Mexico's productivity growth.

Currently, the road network is plagued by inefficiencies and there are border issues that need to be addressed (OECD, 2007). The government is committed to further developing road

infrastructure through public-private partnerships and concessions roads. Clarifying long term government plans would help private sector involvement. Scarce public resources should be invested in areas that are less attractive to private investors, but may be economically justifiable to facilitate inter- and intra- state commerce, as well as better integrate remote rural areas (OECD, 2007).

For such tasks, planning processes are carried out by these federal agencies:

- SCT: responsible for the formulation and implementation of policies, plans, and programs to develop communications and transportation at the national level
- SRE: participation in the planning, construction, and operation process of international bridges and border crossings in the international arena
- Secretariat of Social Development (*Secretaría de Desarrollo Social*, SEDESOL): responsible for transportation planning specially focusing in areas of inferior living conditions

SCT's History, Role and Organization

SCT has its first origins in 1821 when the Secretariat of Foreign and National Relations (*Secretaría de Estado y del Despacho de Relaciones Exteriores e Interiores*) was established. Subsequently, the communications and transport functions were disseminated in several governmental entities. In an effort to centralize national communications functions, the General Administration of Roads and Tolls (*Administración General de Caminos y Peajes*) was created in 1857, nevertheless the first effective attempt to such task was in 1891 with the establishment of the Secretariat for Communications and Public Works (*Secretaría de Comunicaciones y Obras Públicas*).

From 1913 until 1934, several of its faculties were included or suppressed to the latter secretariat; nevertheless, it is important to note that in 1936, the power to grant concessions in transport and communications matters was added. Due to the major expropriations of Ferrocarriles de México, S.A., railway supervisory and normative authority was also added to SCT's powers in 1938.

As a consequence of Mexico's demographic explosion and socioeconomic evolution, in January 1959, the Secretariat for Communications and Public Works disappeared to give rise to two new secretariats: SCT and the Secretariat of Public Works. However, it wasn't until 1964 that express obligations and authority of both secretariats were enacted through their Interior Regulation (*Reglamento Interior*).

In 1976, several relevant amendments were enacted; SCT was given additional powers related to merchant marine and port infrastructure, railway tracks construction, and sectoral coordination among all public agencies and parastatal companies in communications and transport matters. Consequently, in order to coordinate its new port infrastructure powers and private participation, the General Coordination of Ports and Merchant Marine (*Coordinación General de Puertos y Marina Mercante*, General Coordination of Ports) was created.

In 1982, the PFA undertook major reorganization and with it, SCT was also assigned authority to build, maintain, and reconstruct transport and communications infrastructure; consequently, it also became responsible for all planning and execution functions in transportation issues. Under this scope, the General Coordination of Planning and SCT Centers (*Coordinación General de Planeación y Centros SCT*, General Coordination of Planning) was

created. Between 1983 and 1988, SCT's internal structure was modified several times. During this period, the Mexican Institute of Transportation (*Instituto Mexicano del Transporte*, IMT) was added to SCT's structure.

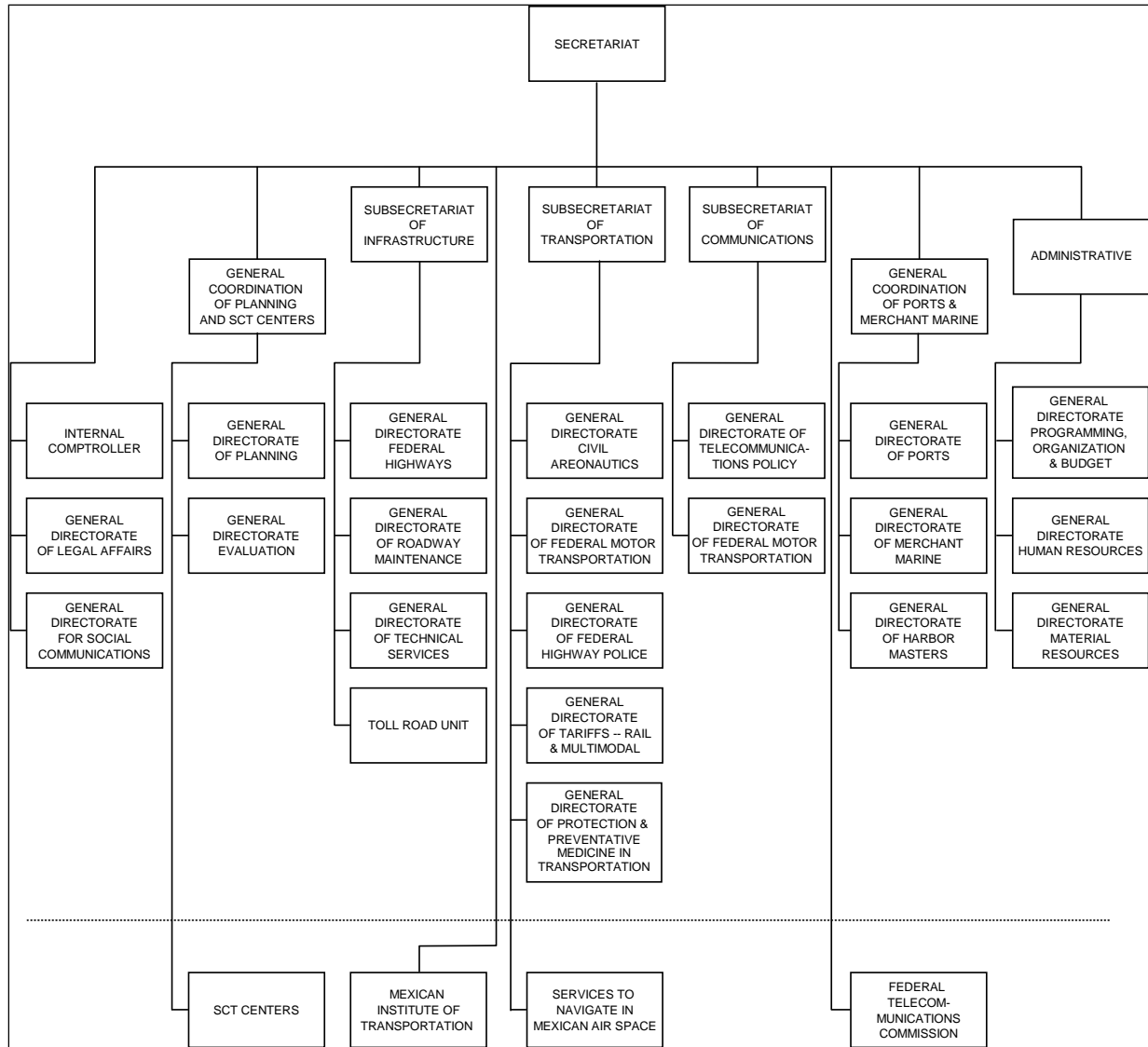
In 1992, in accordance with the Port's Infrastructure Modernization Program, a decree was enacted to extinguish Puertos Mexicanos, SCT's ports management entity, in order to privatize solely ports operations.

Finally, in March 1994, SCT's new Interior Regulation (*Reglamento Interior*) was published. A diagram of SCT's structure can be seen in Figure A2.

SCT has had an evolving role; to attend the growing participation of the private sector in building and operating transport infrastructure and the increasing government's decentralization to the states. SCT also has authority regarding specific functions related to coordination and planning. SCT's main planning and coordination functions are carried out through the General Coordination of Planning and the General Coordination of Ports.

SCT's General Coordination of Planning was created in March 1987 (it already existed under another name since 1983's major amendments) with an objective to link SCT at the federal level with the states through the SCT Centers (*Centros SCT*) as well as with other administrative units. Its primary planning and coordination and planning functions consist of:

- Define and execute planning policies in accordance with the NDP and other applicable programs related to communications and transport
- Take part in the National Democratic Planning System
- Frame and revise the national planning documents related to transportation
- Obtain useful information to draft the planning reports delivered by the SCT to the President evidencing its yearly progresses
- Intervene in the execution of the sectoral programs regarding planning and coordination activities
- Draft and provide information related to transportation and communications programs and projects
- Draft studies related to the viability, evaluation, and budget of the projects
- Draft, together with the SCT Centers, a proposal of the policies for the development of the transportations and communications sector
- Coordinate and define the projects and programs for the SCT Centers
- Execute and follow-up financial commitments with international financial organizations
- Participate in SCT's decentralization process



Source: SCT, 2007.

Figure A2: SCT Structure

The General Coordination of Ports was created in December 1976, when SCT was given additional administrative functions related to ports. Its main functions are:

- Define and execute planning policies related to ports infrastructure to increase their competitiveness
- Build and upkeep ports, maritime, and dredging works
- Coordinate other transportation means related to ports in order to improve intermodal transportation and regional development
- Frame and revise the planning documents related to ports in order to promote private investment

- Execute and follow-up financial commitments with international financial organizations related to ports
- Participate in SCT's decentralization process

Thirty-one SCT Centers represent and carry out SCT's operative functions in each state. In December 1982 SCT Centers were formally established in the SCT's structure as administrative units, and in May 1983 their administrative structure was published. In 1988, port matters, such as maritime works, were added to SCT Centers planning and infrastructure activities. Furthermore, in 1991, 185 additional administrative units are added to SCT Centers to include, among others, airports, federal road transport, railway inspection, and further port authorities.

Currently, its main planning functions are to:

- Build, modernize, and preserve road, airport, port, and communications infrastructure
- Supervise SCT services to be provided at a state level

Thus states transportation planning activities are carried out in coordination with the correspondent federal entities. For that purpose, the General Directorate of Planning was created at the SCT's federal level and whose primary functions are to coordinate SCT's actions at federal (with other agencies), state, and municipal levels, as well as with the private and social sectors, to carry out the Sectoral Programs goals. As mentioned earlier, the Planning Law has the primary goal to establish an effective mechanism for the federal Executive to coordinate all planning activities among federal entities; the latter goal is captured in the PND.

SRE's History, Role and Organization

SRE has its first origins in 1821 when the Secretariat of Foreign and National Relations (Secretaría de Estado y del Despacho de Relaciones Exteriores e Interiores) was established. From that date until 1891, the latter secretariat changed its designation in numerous occasions to finally remain SRE. Among its many functions, SRE encourages participation in the planning, construction, and operation process of international bridges and international crossings. The last major SRE's administrative structure reorganization occurred in March 2004 to remain as follows:

Border transportation infrastructure is considered by Mexico as a priority; bilateral infrastructure construction, operation, management and maintenance is essential (SRE, 2007). In the case of roads and highways, this process has been taking place since 1983 through the Mexico-U.S. Binational Group for Bridges and International Bridges (*Grupo Binacional México-Estados Unidos sobre Puentes y Cruces Internacionales*).

Together with the Subsecretariat for North America (*Subsecretaría para América del Norte*), and specifically through the Mexican Section of the International Commission for International Limits and Waters Mexico-U.S. (*Sección Mexicana de la Comisión Internacional de Límites y Aguas México-Estados Unidos de América*), the Interagency Group on Ports of Entry and Border Services (*Grupo Intersecretarial de Puertos y Servicios*, Interagency Group) is compelled to revise and approve any projects and works related to Mexican borders, including international bridges. The Interagency Group, coordinated by the SRE, was also created in 1983 (Barton-Aschman, 1997) and its Mexican section of Interagency Group is composed of):

- Secretariat of Interior (*Secretaría de Gobernación*)

- Secretariat of National Defense (*Secretaría de Defensa Nacional*)
- Secretariat of the Treasury and Public Credit (*Secretaría de Hacienda y Crédito Público*)
- SEDESOL
- SEMARNAP
- SCT
- Federal Toll Highways and Bridges (*Caminos y Puentes Federales de Ingreso, CAPUFE*)
- Secretariat of the Public Function (*Secretaría de la Función Pública*)
- Secretariat of Tourism (*Secretaría de Turismo*)

The Interagency Group was created in order to coordinate federal, state, and municipal entities that are involved in the negotiation, construction, operation, and maintenance of ports of entry in the Mexican borders (SRE, 2007). Additionally, this group examines and analyzes the viability of new ports of entry projects within its scope of duties:

- Protecting the national border sovereignty, security, and integrity
- Increasing the efficiency of land communication with neighbor countries
- Strengthening bilateral border cooperation
- Promoting national and border states development

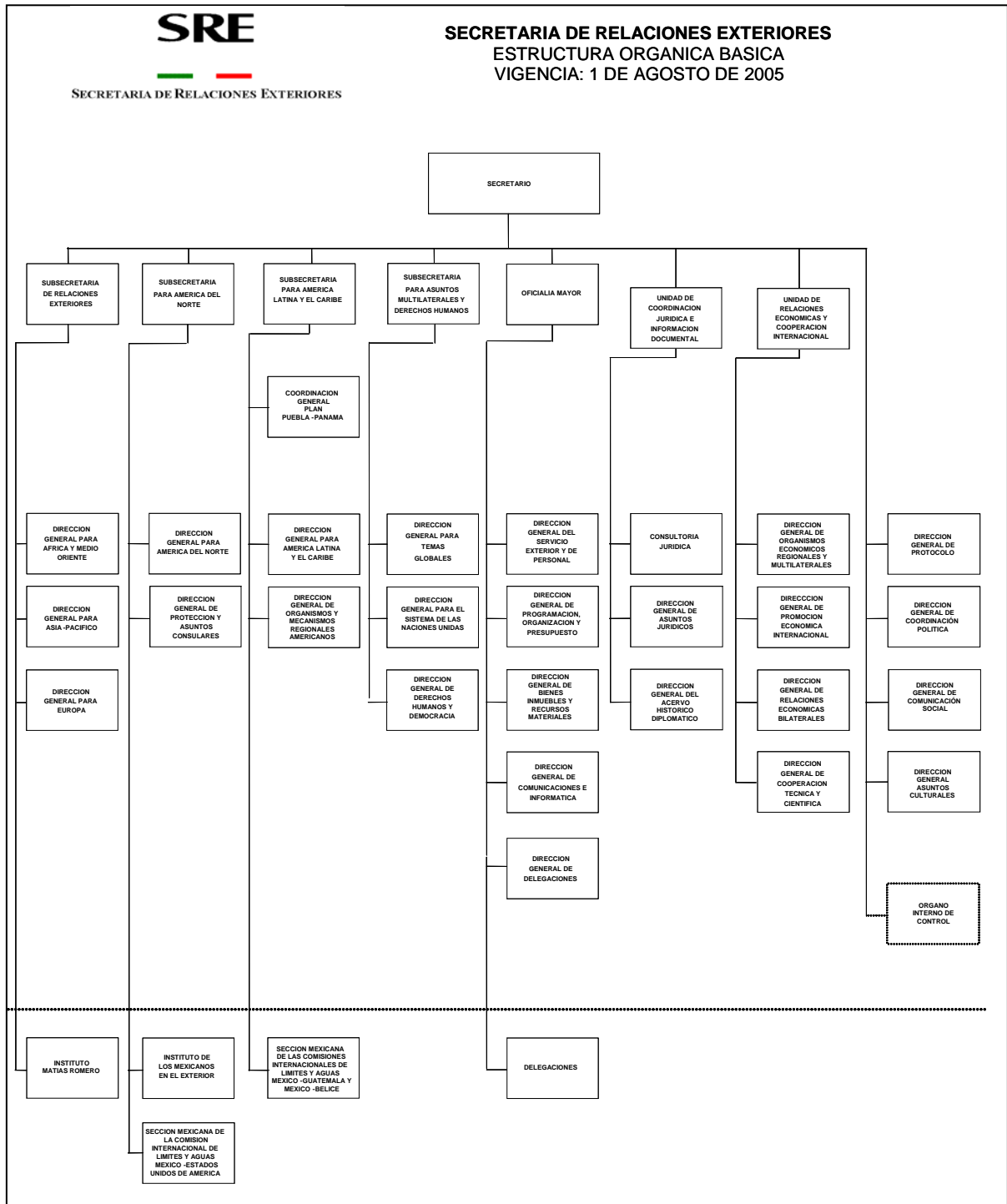
At the Mexico-U.S. border, the Interagency Group has as its primary policy to develop ports of entry in coordination with local governments. This is to avoid irregular urban development – often motivated by economic expectations from infrastructure construction – and create a more positive environmental and ecological balance (Barton-Aschman / la Empresa, 1997). This group’s investigations and work are discussed every 6 months in the Mexico-U.S. Binational Commission for Ports of Entry and International Crossings Meeting. The latter discusses and seeks to give solutions to current problems in that area.

SEDESOL

SEDESOL was created in 1976 under the name of Human Settlements and Public Works Secretariat; its main objectives focused in the development of urban and human settlements and resolving ecological problems related to housing. In 1982, the latter was renamed as Urban Development and Ecology Secretariat. Ten years later, in 1992, the current SEDESOL was created to fight poverty.

SEDESOL played an active role in urban planning processes. Its role was primarily setting standards in the urban infrastructure planning and designing, but it is also involved in financing, or pursuing financing, and supervising development (but not execution) of projects. Nevertheless, in 2001, during President Fox’s administration, SEDESOL’s objectives changed and since then there has been a transition, instead of struggling with the consequences of poverty it now attempts to fight its origins. Among its main programs, none of them focus in transportation development or planning although one of SEDESOL’s objectives under the current presidential administration includes connecting isolated communities and areas of

inferior living conditions (in a similar fashion to the Border Colonia Access Program administered by TxDOT).



Source: SRE, 2007

Figure A3: SRE Structure

Transportation Sectors

Many transport projects were originally constructed and operated privately (for example, railroads). After NAFTA entered into force, Mexico has had significant success securing private participation and investment in the transportation sector, including roads, railroads, ports, and airports. However, performance has been uneven, with the road sector having the worst record; in railroads and ports significant efficiency gains have been achieved, but further gains can and should be secured (Pargal, 2001).

An integrated vision and policy for the sector is needed. Modes of transport have been developed without enough attention to their complementarities. Access to facilities (particularly ports) remains deficient, and there is a lack of supporting distribution centers and dry ports to facilitate the smooth movement of goods (Pargal, 2001). As a result, logistic costs and inventory levels remain high, impacting competitiveness and productivity. The Calderón NDP (issued in late 2007) will begin to redress the imbalance, by prioritizing connectivity on the highway side and targeting strategic investment to multiple modes.

While deregulation of transport has been extensive at the federal level, this has not been matched at the state level, adversely affecting costs and productivity (Pargal, 2001). Sectoral regulation in general remains scattered and weak, needing significant amendments both institutionally and at the micro level.

Highway system

Before the 1920's, the drivers that used Mexican roads maintained them to a certain degree. Some private companies even had on its payroll workers that were in charge of road maintenance. During Alvaro Obregon (1920–1924) presidential campaign he offered to enact laws related with building highways and railroads as well as maintenance (Camara Nacional de Autotransportes de Carga, 2006). Once president, Obregon built several roads from Mexico City to Texcoco, Toluca, and Puebla.

Nevertheless it was not until 1932 that the first General Means of Communication Law (*Ley General de Vías de Comunicación*, Communication Law) was enacted. A few years later, during President Cardenas' government, a new Communications Law was enacted. The Mexican transportation regime was highly controlled and monopolistic (Perry & Rehman, 2004). Its anti-foreign based rules and highly restrictive domestic regulations severely constrained growth and competitiveness of the industry and infrastructure. Prior to the negotiation of NAFTA, foreigners could not take part in transportation or other infrastructure activities.

In 1993 the Communications Law underwent major modifications; since then, it only regulates Postal Services routes. The Law of Roads (a federal statute) was enacted the same year, just before NAFTA entered into force. The Law of Roads regulates the development of highway infrastructure including the use of the concession regime. Among its rules it defines as roads or byroads:

- Those which connect with any road or byroad in a foreign country
- Those that connect two or more states of the Federation
- Those which in their totality for the most part are built by the Federation with federal funds or by means of federal concessions by private parties, states and municipalities

According to SCT (2006), Mexico's highway system may be classified as:

- Federal highways: this system is solely maintained and developed by the federal government. Its routes are used between Mexico's major cities, large itineraries and are related to international trade and the most dynamic economic sectors.
- State roads: this system make regional trade more effective linking farm businesses and thus contributing to regional integration.
- Rural roads and enhanced openings (*brechas mejoradas*): this system is constituted of modest roads, generally not paved. Their value is more social than economic since they connect small rural communities that would be otherwise completely isolated.

Despite its heavy reliance on trucking, Mexico's highway system is sparse and inadequate (OECD, 1999). The federal system is composed of federal roads and concessioned highways, which are privately-owned toll roads. The federal network consists of mainly free paved roads, directly managed by SCT. There are also toll roads under its control. A separate body, Federal Roads and Bridges (*Caminos y Puentes Federales*, CAPUFE), manages some of the tolled roads and bridges. Concessions to private sector operators or to states make up the remainder of the network (Giugale, et al., 2001).

The institutional structure for administration of tolled facilities is diffused between the Trust for the Support and Rescue of Concessioned Highways (*Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas*, FARAC), CAPUFE, SCT, and multiple private and public concessions. As a consequence an incomplete road network with wide variations in maintenance and pricing standards has evolved (Pokorny, 2001).

Most of the toll roads have been built since 1989. Although a welcome development, these new highways are grossly under-utilized, mostly because their tolls are very expensive. The Mexican highway system is in need of substantial investments to build new roads and repair the current system (Eaton, 1997). The lack of public funds has forced the Mexican government to turn to the private sector for highway improvements. The government has engaged the private sector through the granting of concessions to build and operate toll roads.

During the National Solidarity Program (*Programa Nacional de Solidaridad*, PRONASOL) of former President Salinas (1988–1994), several private companies were given special concessions to build and operate highways for a period as short as 8 years (Eaton, 1997); the average duration was 12 years and two were for only 5 years (World Bank & PPIAF, 2003). To recoup their substantial investments during this period, companies were forced to implement user fees that were prohibitively expensive.

As a result, the private sector could not afford to use the toll roads, and concession holders did not receive user fees sufficient to pay their obligations. In essence the short concessionary period forced these companies to institute user fees that were substantially higher than most travelers and truckers were willing to pay. As a consequence many of the toll road projects needed to restructure their debt. This was compounded by high interest rates, low usage, and short concession periods which caused financial problems for many Mexican construction companies. Concession holders, according to Eaton, were forced to renegotiate their obligations with international banks or request special assistance from the Mexican government (Eaton, 1997).

All this occurred at the time of Mexico's financial crisis which began in 1992. The severe liquidity and solvency problems faced by private toll road operating companies after the 1994–95 financial crisis led to a government rescue effort in August 1997. This was achieved

through the use of a trust fund established within the National Bank of Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*, BANOBRAS) called FARAC. As a result of the rescue operation, the trust fund acquired both the assets (the toll roads and the income stream generated by the tolls levied) and the liabilities of the toll road operating companies. Part of the bank debt of the toll road operating companies had already been restructured into long-term UDI-denominated Notes (*Pagarés*) under the different debtors' support program in place before August 1997 (Giugale, et al., 2001). As of March 2007, FARAC's debt, as guaranteed by the federal government, amounted to MXP \$165 billion (Aguilar, 2007).

In February 2008, the Mexican government unveiled U.S. \$4 billion Infrastructure Fund that will be used to finance projects of the Infrastructure Program. The fund's base was FARAC which disappeared.

One fundamental change, which has helped to lure private capital back into the construction of highways in Mexico, is that government concessions to build and operate freeways are for a 30 year period. This change has allowed private companies more time to recoup their investments while charging reasonable tolls.

In the case of roads, a concession is required to construct, operate, exploit, preserve, and maintain public highways, roadways, and bridges. The concession is only granted to Mexicans or companies created in accordance with Mexican Law.

The Non-Tolled federal System is over-dimensioned, according to Pargal (2001) because half of this system does not fulfill the functions of a core federal system. Previous attempts to decentralize the responsibilities for the non-core network failed because of unreliable funding. The current non-tolled highway system is substantially underfunded, both in terms of modernizing and of maintaining the existing infrastructure.

Railroad system

National Railways of Mexico (*Ferrocarriles Nacionales de México*, FNM) was established in 1873. The Mexican government owned the rail network from 1937 until 1997 when it privatized the first of four railway regions to be sold as concessions. In February 1995 Article 28 of the Mexican Constitution was amended to reclassify railroad activity and to permit private investment. So in 1995 the door opened to private participation in the government owned monopoly over railroads

Later, in May of 1995, the Railroad Law was enacted, to provide a framework including the mechanisms, measures, and regulations that would govern the granting of concessions and permits to private investors. Finally, in November of 1995, the General Guidelines for the Participation of Private Investment in the Railroad System (*Lineamientos Generales para la Apertura del Servicio Ferroviario*) were issued by SCT. This legal framework, details the procedures for segmenting the existing railroad system by region, as well as the sale mechanisms for the public bidding for such segments. It also sets the rules for national and foreign investment participation in the sector. It is important to mention that foreign investment in railroads is restricted to 49% ownership.

The experience in the privatization of railroads has can be summed up in three problems: too few bidders and low bids, valuation problems, and rights-of-way problems (Franck, 1998). The first competitive bidding process was the Chihuahua-Pacific Railroad. This process was declared void by the authorities because the bid presented was lower than the minimum threshold required by the government.

Since then, the Northwest Railroad and the Pacific North Railroad privatizations have been successful. The Southwest Railroad and other short railroads have also been privatized. In 1997, the Laredo-Mexico City rail link, known as the Northeastern rail concession, was purchased in a joint venture between the Kansas City Southern and TMM, which is the largest marine transportation company in Mexico.

Railroad privatization, starting in 1996, involved the geographical separation of the assets and operations of FNM (the state-owned railroad company controlled by SCT) to set up a number of route-based companies according to preexisting regional divisions, each of which was awarded a 50-year renewable concession title allowing it to operate, exploit, and, if required, build new lines.

To counteract monopoly power over exclusive domains, and to promote effective competition among operators, concessions were designed to share common tracks around major urban and industrial areas (for example, Mexico City and Monterrey) and several ports (Tampico and Veracruz). For these cases, concession titles included detailed mandatory access and connecting rights between concessionaires, with prices to be bilaterally negotiated.

Mexico City's Terminal, *Terminal Ferroviaria Valle de México*, has been privately managed since April 1998. Each of the three main rail operators owns 25% of the shares (included in their auction packages), whereas the government retains the remaining 25% (Pargal, 2001). For the medium term, the only major rail project in Mexico will be the Trans-Isthmus railroad in Tehuantepec, which will remain in public hands for possible future development.

The second stage of the privatization process was the sale of the 80% of the shares of the concessionaire companies owned by the government through a public bidding process. Concessionaires are free to set their own tariffs in recognition of the extensive competition from trucks and the potential for competition among concessions. Currently Mexico has the following railroad concessionaires (SCT, 2006):

- Mexican Railroad Transportation (*Transportación Ferroviaria Mexicana*, TFM)
- Mexican Railroad (*Ferrocarril Mexicano*, FERROMEX)
- Southeast Railroad (*Ferrocarril del Sureste*, FERROSUR)
- Mexican Valley Railroad Terminal (*Terminal Ferroviaria del Valle de México*, FERROVALLE)
- Coahuila Durango Short Line (*Línea Corta Coahuila-Durango*)
- Chiapas-Mayab Railroad Company (*Compañía de de Ferrocarriles Chiapas-Mayab*)
- Tijuana-Tecate Short Line (*Línea Corta Tijuana-Tecate*)
- Tehuantepec Isthmus Railroad (*Ferrocarril del Istmo de Tehuantepec*)

The rail privatization process appears to have worked well, as indicated by the low number and level of disputes and complaints (Pargal, 2001). As a result of this traffic increase, productivity and safety indicators have also improved.

The railroad privatization model has included several factors that promote competition among private railroads. According to the World Bank & PPIAF (2003), these are the market area characteristics of the railway concessions.

Table A6: Mexico's Railway Concession Market Area Characteristics

Indicator	Pacific-North	Northeast	Southeast	Short Lines*
Track (% of total)	30.3	19.3	10.7	38.7
Freight traffic (%)	46.2	37.6	8.6	7.8
Main cargoes	Iron, Coal, Oil	Corn, Wheat Iron	Corn, Wheat, Oil	Varies, depending on the region
Major Industrial Cities	Mexico City Monterrey Guadalajara	Mexico City Monterrey Guadalajara	Mexico City	Several
Major Ports	Tampico Manzanillo	Tampico Veracruz L. Cardenas	Veracruz Coatzacoalcos Salina Cruz	None
U.S. Border Crossings	Piedras Negras Ciudad Juárez Nogales Mexicali	Nuevo Laredo	---	Tijuana Nogales Ciudad Juárez
U.S. Connecting Railroads	Burlington Santa Fe Southern Pacific	TX-Mex Railway Union Pacific	---	---

Source: World Bank & PPIAF, 2003.

* Does not include the Tehuantepec Isthmus Railroad

Ports

For many years, Mexico concentrated its infrastructure development inwards on roads, neglecting its ports; however Mexican port traffic has been growing in recent years (Nolan, 1999). Eager to include ports in its overhaul of the Mexican transport system, the Salinas government targeted the major ports of Veracruz, Tampico-Altamira, Manzanillo and Lázaro Cárdenas in major renovation in the late 80s and enacting the Ports Law in 1993 (Nolan, 1999).

Thus, the reform of Mexican ports started in 1993 with a new Ports Law and the dismantling of the public port agency *Puertos Mexicanos*. The reform consisted of (Pargal, 2001):

- Decentralization, which resulted in the creation of independent Port Administrations (*Administraciones Portuarias Integrales*, APIs) at each port or group of small ports. These are autonomous, self-financing, publicly owned companies that act as landlords. APIs have title to the concessions for the use and management of ports. APIs have been sold to the private sector through public bidding processes. Foreign investment is permitted up to a 100% in the port sector.
- Privatization (including the participation of foreign investors) of the operation of terminals and other facilities.
- Competition between ports and between operators within ports. This was achieved by the liberalization of tariffs and the elimination of cross-subsidies and barriers to entry.

Under the new law, the country's twenty-two principal ports are now privatized with control scheduled to pass from the federal government to distinct local, public-private partnership port authorities. Under the privatization plan, the government also granted private concession for 20 years for the construction of and operation of new, modern terminals (Nolan, 1999).

The concessioning process consisted of three phases (Pargal, 2001): (a) concessions granted by the federal government to the APIs (*títulos de concesión*); (b) concession contracts signed between APIs and private operators for the use of port assets and the provision of services (*contratos de cesión parcial*); and (c) privatization of APIs. The federal government, through SCT, acts as port authority, and it is the agency that grants all concessions, licenses, and authorizations.

Table A7: Details of Port Concession Contracts in Mexico

	Concession Contracts between the Federal Government and APIs (<i>títulos de concesión</i>)	Concession Contracts between APIs and Private Operators (<i>contratos de cesión parcial</i>)
Prequalification	APIs must be companies established according to Mexican laws, with negotiable shares labor	1. Technical administrative capacity 2. Operation and business plan, and strategy
Obligations	APIs had to abide by the (i) Port Development Master Plan, (ii) Elaboration of annual Operative Plan, (iii) Dredging and Signaling regulation, (iv) Creation of fund for port modernization, and (v) environmental and safety regulations	Investment on infrastructure and equipment, according to proposed plan. Targets on productivity indexes, as detailed in the Annual Operative plan elaborated by the APIs Environmental and safety regulations
Payments	APIs compensate SCT for the use of infrastructure owned by the Federal Government	Private operators compensates API for the use of infrastructure of its business
Contracts	APIs must grant concession contracts to private operators for them to provide port services The system of granting contracts must be a public auction.	---
Winner selection	Direct	Higher annual payment to API
Term	50 years, renewable	15-20 years, renewable. Example: Manzanillo's container terminal was granted for 20 years

Limitations	SCT can oblige APIs not to perform any port service directly, but to contract the provision with private operators	Municipal charters, ordinances, rules, and regulations
Ownership	State jurisprudence, state administrative rulings	No limits to foreign participation Operators or their associates are not allowed to own shares of APIs Operators or their associates cannot own shares of firms providing services on similar facilities at other ports on the same coastline
Information requirements	Doctrine, custom, general principles of law, equity	Provide APIs with statistics on traffic and operations regularly
Tariff regulation	Port tariffs set freely by APIs. Only for special market conditions some maximum limits will be established	Tariffs for port operations set freely by private operators if enough competition exists, otherwise maximum limits are imposed. Application to the Federal Commission of Competition to determine need of regulation
Contract renegotiation	If term is extended, or when public share of capital falls below 51%	If term is extended
Conflicts	APIs must respond directly to SCT	Arbitration mechanism established: institution, Mexican section of Inter-American Commission for Commercial Arbitration. Each party selects an arbiter, and both arbiters select a 3 rd member
Sanctions	Determined by SCT	Penalties detailed by type of fault

Source: World Bank & PPIAF, 2003.

Private participation has induced significant changes in the port industry in terms of investments in infrastructure and improvements in quality of service and tariffs (Pargal, 2001). The number of port workers employed by the public sector has declined, but total port employment by private firms is rising due to an increase in the activity of ports. Another major reform was the liberalization of the labor market, so that wages and work conditions are determined by market forces and firm-level bargaining, rather than collective bargaining.

Tariffs and prices are now set freely by market forces. Port tariffs, charged by APIs to ships for the use of common infrastructure, are based on price caps derived from port-specific long-run marginal costs. The system as a whole does not require any external subsidy for efficient operation, and the cross-subsidies between ports have been eliminated (Pargal, 2001).

The system promotes competition among ports, since APIs can lower their port tariffs to try to attract traffic.

Nevertheless, certain states, where APIs are located, have complained that they provide—for free—all public services to APIs and do not receive any economic benefit, since the latter are established as business associations that are sold through public bidding processes (Siempre!, 2004).

Airports

Mexico's prior experience with the privatization of the railroad system paved the way for the airport privatization (Serina, 1999). Most of Mexico's civil airports are operated by *Aeropuertos y Servicios Auxiliares* (ASA), a public corporation created in 1965. Public investment has lagged growth in airport activity due to the country's fiscal constraints (Pargal, 2001). To increase investment and ease its fiscal burden, in 1995 the government decided to offer concessions to the private sector for the operation of the major airports.

The 1995–2000 NDP instructed the establishment of an adequate, modern, and efficient airport infrastructure. The Airports Law that authorized private participation was enacted in December 1995 and the guidelines for private investment were published in February 1998.

The process involves the creation of corporate entities in which the government retains majority interest. Each of these will be granted a 50-year concession to operate a specific airport. Concessionaire entities will be grouped under a controlling entity, which will own the shares of capital stock of the concessionaire entities.

The most important aspects of the Airports Law include the establishment of four regional airport concessions and the creation of their respective holding companies. The participation in the holding companies is to be initially shared between the federal government and a strategic partner to be made up by a qualified Mexican partner and one or more foreign investors.

The strategic partner is initially entitled to own 15% of the holding company and may increase its participation to 20% after 5 years. Once the concession of 30 years is awarded to the strategic partner, the government will then sell its shares in the holding company through a public offering through the international capital markets. Under this scheme, the Mexican government seeks to turn the running of the airport system over to private investors and world class airport operators (Serina, 1999).

In May of 1998, four groups were created to take control of certain geographic zones—they all had temporary state participation (SCT, 2006):

- Grupo Aeroportuario del Sureste, S.A.de C.V.
- Grupo Aeroportuario del Pacífico, S.A.de C.V.
- Grupo Aeroportuario del Centro Norte, S.A.de C.V.
- Grupo Aeroportuario de la Ciudad de México, S.A.de C.V.

The airport privatization program was launched in early 1998 with the identification of thirty-five airports to be included in four concession packages (Pargal, 2001). For example, the first package awarded was to the Southeastern Group (*Grupo Aeroportuario del Sureste*), which was seen as the most financially attractive since Cancun has a new airport with little investment required and with strong and growing demand. All concession packages are subject to a form of price-cap tariff regulation, with adjustments for inflation.

Multimodal

Multimodalism is one of the fastest growing sectors today (Braid, 1998). While the transport system is many faceted, road transport has become the predominant mode in Mexico and for cross-border trade with the United States. Mexico is on its way toward an integration of its transport network—the ports, for example, have improved turnover time and most performance indicators, including the transfer to trucks.

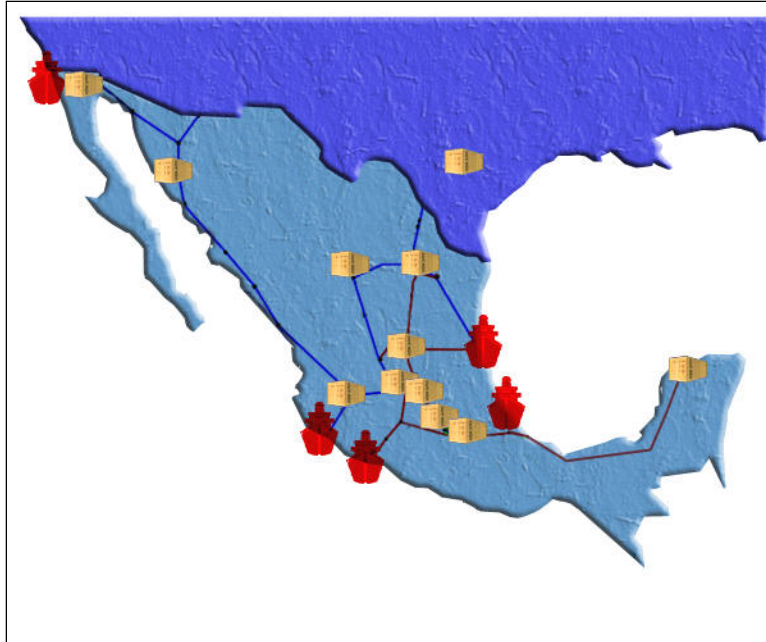
In 1995 existing legislation did not have much success in promoting multimodality in the Mexican transport sector (Pargal, 2001). Multimodal agents providing integrated intermodal services were not regulated, because they were considered to be commissioned traders subject to commercial law. For multimodal terminals, a special permit (ensuring minimal quality) was the sole requirement for entry.

A new initiative to coordinate the relevant participants was launched in 2004 in an effort to spur private sector logistics processes. In accordance with the 2001–2006 NDP, public and private entities signed, on June 15, 2004, the Multimodal Corridors Development Coordination Agreement (*Acuerdo de Concentración para el Desarrollo de Corredores Multimodales*, Multimodal Agreement). The latter is part of a master plan for multimodal corridors since the growth in freight movements has placed constraints on existing transportation facilities (Villa, in progress).

The Multimodal Agreement was signed by public and private entities. As for the public entities, SCT, SEMARNAT, Secretariats of Public Safety, Treasury and Public Credit, Economy Agriculture, among others; as for private parties, the Confederation of Industrial Chambers of the United Mexican States (CONCAMIN), Mexican Association of Multimodal Transportation, Sea Transport Mexican Association, Sea and Ports Terminals Mexican Association, TFM, FERROSUR, FERROVALE, among others; executed the agreement.

The Multimodal Agreement's main objective is to promote the development of multimodal corridors, thus increasing the competitiveness of the Mexican economy, through the creation and improvement of logistic chains between Mexico and foreign countries. It also aims to enhance coordination of the relevant parties and to advance their commitment, through their experience, knowledge, and capabilities, to better move goods across the country. The agreement targets specifically issues regarding competitive interconnection, thus decreasing costs.

Additionally, the Multimodal Agreement creates the Interinstitutional Committee for the Development of Multimodal Corridors (*Comité Interinstitucional de Facilitación para el Desarrollo de Corredores Multimodales*), a public-private partnership that brings together the representatives of each of the parties to effectively design mechanisms and strategies related to the development of multimodal corridors. This committee will also be in charge of drafting a procedural manual for each corridor, generate data in connection with the productivity of each corridor, and to establish mechanisms to solve the corridor's users requirements, among others. Figure 6.1 illustrates the existing intermodal terminals in Mexico as of 2006.



Source: Asociación Mexicana del Transporte Intermodal A. C (2006)

Figure A4: Intermodal Terminals in México

Even though Mexico has made effort to make the multimodal market more competitive, the latter still faces the following problems:

- Overlapping of institutional responsibilities between federal and state governments
- High costs (due to road tolls, fuel prices, and high interest rates). A study carried out by the Mexican government and the private sector confirms that Mexico has a potential disadvantage in connection to other competitive countries; the study (*Diagnostico General sobre la Plataforma Logística de Transporte de Carga de México*), and the Mexican Institute for Competitiveness (*Instituto Mexicano de Competitividad*) performed a complete analysis of competitiveness in 2004, including a chapter related to logistics. Both confirmed the need to further reduce costs in multimodal operations (World Bank, 2006).
- Coordination among multimodal agents and authorities needs to be smoother (Pargal, 2001).
- The gains achieved through port reform in terms of loading and downloading time are undone by long waiting times for truckers and trains in the interior. Thus, significant improvements in the logistic management of surface transport modes and, in particular, a greater user orientation among service providers is required. A prerequisite for this is higher intramodal competition (within the trucking industry) and intermodal competition (between trucks and rail) (Pargal, 2001).
- The lack of security for freight movements needs to be addressed (Pargal, 2001). Even if new permits for intermodal installations and dry ports are granted the concessionaire face serious problems to finding insurance coverage because premiums for local operators are

high (Pargal, 2001). International operators manage more easily, although they too cannot easily obtain coverage for lost or stolen cargo.

According to the Under-Secretariat of Industry and Commerce (Secretariat of Economy), some actions have been implemented with direct positive impacts on logistics costs reduction (World Bank, 2006):

- Modernization of more than 75% of the highway corridors, with the execution of the Multimodal Corridors Development Coordination Agreement (with the participation of the relevant parties involved the transportation and distribution of goods logistics business)
- Fiscal stimuli to small carriers for the elimination of obsolete units (scrap vehicles) with amounts from 15% of the value of the new vehicle.
- Record levels in the transportation of cargo by railroad (more than 90 million tons) and air (more than 492,000 tons)

International Treaties and Cooperation Arrangements Related to Transport Planning.

Mexico law applies international treaties which hierarchically are placed under the Mexican Constitution and above federal regulation (Mexican Supreme Court, 1999). However, the central point of controversy in the Mexican legal system with respect to treaties is their status relative to internal law (Perezniето, et al. 2004). Treaties need to be signed by the Executive Branch but also ratified by Congress in order to come into force in Mexico.

NAFTA

NAFTA, a free trade agreement signed between the United States, Canada, and Mexico entered into force on January 1, 1994. In light of the further development of economic and commercial relations associated with the Agreement, the United States and Mexico recognized the need for a well-coordinated transportation planning process along the border.

NAFTA has represented an opportunity for the development of commerce among its three members as well as for Mexico. Economic openness, privatization of state-owned companies, and deregulation are important changes. Open and equal systems will allow for expanded economic development between and among countries (Irurita, 1998). The same applies to politics, where democracy is a basic requirement that supports a broad economic relationship.

Under NAFTA, Canadian and United States railroads are able to continue marketing their services in Mexico. They are also able to continue to operate unit trains with their own locomotives, construct and own terminals, and finance rail infrastructure. Mexico continues to enjoy full access to the Canadian and United States railroad system.

In addition to transportation-specific reservations and commitments to liberalize, the United States, Canada, and Mexico agreed to other terms and conditions that affect the transportation industries of the three countries. The most significant transportation provisions are contained in Chapter Nine of the treaty.

The treaty recognizes the importance of the member countries' existing laws and regulations designed to promote safety; protect human, animal, and plant life and health; the

environment; and consumers. However, Chapter Nine also reflects the parties' agreement not to use these provisions (referred to in the text as "standards-related measures") as unnecessary obstacles to trade (Izquierdo, 1999). Chapter Nine declares the parties' intent to cooperate and work towards harmonizing these measures so as to facilitate free trade and reduce the additional costs that arise from having to meet different requirements in each country.

NAFTA gave birth to new transport planning policies. Although it appears this treaty has no clear commitments for its members regarding transport planning activities, in light of the further development of economic and commercial relations associated with the agreement, the United States and Mexico recognized the need for a well-coordinated transportation planning process along the border.

In the case of Mexico all of the subsector's laws were amended or new laws were enacted to better transport infrastructure as a response for the new trade agreement. In the case of the U.S., in the 1990s, there was a resurgence of plans for new freeways. Several major upgrades to the interstate system were unveiled to help implement NAFTA, as well as building new and expanded north-south trucking routes between Canada and Mexico. These new plans for megaroads in the U.S. started to pave new NAFTA superhighways (Robinowitz, 2006).

The NAFTA superhighway concept was first included in the 1991 Intermodal Surface Transportation Act (ISTEA). ISTEA was enacted 2 years before the NAFTA treaty was passed by a Democratic controlled Congress (Robinowitz, 2006). ISTEA included numerous new and expanded north-south interstate highways to facilitate increased truck traffic between Canada and Mexico, plus dozens of other projects to benefit the highway lobby and national distributors (Robinowitz, 2006). ISTEA's expansion of the highway network was followed by the 1998 Transportation Equity Act for the 21st Century (TEA-21), which funneled even more pork dollars for bypasses and NAFTA superhighways (Robinowitz, 2006). Other groups have also promoted corridor projects, including the North American Super Corridor Organization (NASCO) which promotes the existing trade and transportation infrastructure that roughly shadows Interstate Highways 35, 29, and 94 in the U.S. (NASCO Website). NASCO also has a working group that promotes the North American Inland Ports Network (which runs from Mexico through to Winnipeg, Canada) as can be seen in Figure A5.



Source: NASCO

Figure A5: North American Inland Ports Network

Joint Working Committee

The Joint Working Committee (JWC) is a binational group whose primary focus is to cooperate on land transportation planning and the facilitation of efficient, safe, and economical cross-border transportation movements (U.S.DOT, 2008). The group is comprised of transportation professionals from the U.S. Federal Highway Administration (FHWA) and the SCT.

In addition to FHWA and SCT, the members of the JWC include representatives from the U.S. Department of State (DOS), the SRE, the four U.S. border state Departments of Transportation, and the six Mexican border states. The General Services Administration (GSA) and Customs and Border Protection (CBP) of the Department of Homeland Security also participate in JWC meetings.

The main activities of the JWC are to analyze, develop, and coordinate plans and programs that reflect the border transportation needs of both countries (U.S.DOT, 2008). The JWC is a binational group whose primary focus is to cooperate on land transportation planning and the facilitation of efficient, safe, and economical cross-border transportation movements. The JWC promotes effective communication concerning transportation planning between U.S.-Mexico border states and works to develop a well-coordinated land transportation planning process along the border.

On April 29, 1994, the U.S.DOT and SCT signed a Memorandum of Understanding (MOU), establishing the federal Highway Administration's Joint Work Committee. A second binational MOU was signed in October 2000. This MOU reinforced the working relationship developed over the years and provided direction for the group in the future (U.S.DOT, 2008). Among other efforts, the JWC works to:

- Establish methods and procedures to analyze current and future transportation infrastructure needs
- Evaluate transportation demand and infrastructure impacts resulting from future changes in land transportation traffic

The JWC has performed several studies (published online) regarding border transportation planning such as:

- Bottleneck Study: Transportation Infrastructure and Traffic Management Analysis of Cross Border Bottlenecks (2004)
- Binational Border Transportation Infrastructure: Needs Assessment Study (2004)
- Truck Transportation through Border Points of Entry: Analysis of Coordination Systems (2002)
- Binational Planning and Programming Study (1998)

A partnership that complements the work of the JWC and TBWG is the Border Technology Exchange Program (BTEP), which FHWA initiated to provide opportunities for sharing information and technology among the U.S. border states and their counterparts in Mexico and Canada. Its mission is to enhance the knowledge and skill of transportation personnel in the border regions through the exchange of technology, information, and technical training to facilitate the safe, efficient, and secure movement of people and goods.

In recent years, JWC has been analyzing at financing tools available for cross-border projects from U.S.DOT, SCT, states, municipalities, binational agencies such as the North American Development Bank, and international agencies such as the World Bank (Hochman, 2005). The group created an inventory of financing options and is developing workshops on border finance aimed at state and local transportation and finance officials.

Another study is analyzing short-term, low-cost ways to solve road infrastructure and traffic management bottlenecks that slow the movement of people and goods at the U.S.-Mexico

border. The objective is to develop a methodology for conducting consistent analyses of bottlenecks along the entire border (Hochman, 2005).

According to its 2007–2009 working plan, the JWC will focus on issues regarding congestion, safety and security, global competitiveness, and sustainability (Grijalva & Erazo, 2007). Items currently under consideration for the 2007–2009 Work Plan include border wait-time studies, bottleneck studies, traffic studies, road safety audits, regional master plans, innovative finance technical assistance, peer exchange on planning processes and value engineering, and UNAM safety initiatives. The JWC will decide its target issues for its 2007–2009 Work Plan taking into consideration that many of the on-going tasks from the 2005–2007 Work Plan were yet to be completed as of May 2007 (Grijalva & Erazo, 2007).

Partnership for Progress

In 2004, Texas Governor Rick Perry signed several Memoranda of Understanding with the governors of the states of Tamaulipas, Coahuila, Nuevo León, and Chihuahua. The main objective of these memoranda is to joint effort between Texas and border states in Mexico to create new jobs and expand economic opportunities along the border. The agreements also call for an integrated approach to regional economic development, public safety, energy, telecommunications, health, infrastructure, and education.

The cooperative approach taken by the border governors helps to create greater opportunity and improve the quality of life for citizens on both sides of the border tearing down barriers to trade and economic progress. Texas and Mexico have made progress on coordination of transportation issues to help ease the movement of people and goods between Mexico and Texas (Office of the Texas Governor, 2004).

A first logistics workshop was held in Monterrey in January 2006, which included federal, state, and industry representation. Texas Department of Transportation (TxDOT) participated in this workshop, highlighting the planned transportation connections that link the area, including the Trans Texas Corridor (TxDOT, 2006).

State and Local Coordination

Although not regulated, several transportation planning activities across the border region take place. This section highlights some of the most relevant activities.

In the case of Texas, the Texas Department of Transportation's (TxDOT) Pharr, Laredo, and El Paso Districts have a long history of cooperation with transportation officials in neighboring Mexican states (TxDOT, 2006). All three districts have made extensive efforts to work closely and develop productive working relationships with their Mexican neighbors. An important objective is to collaborate on planning and programming for the many transportation projects TxDOT undertakes each year along the border, especially those that involve border crossings.

There are also activities undertaken at the local level between counties/cities along the border with Mexico. These include coordination on transportation planning and, interesting case studies on coordination on rail relocation between Brownsville/Matamoros and El Paso/ Juárez are outlined below.

Brownsville Rail Relocation

The cities of Brownsville and Harlingen, the Cameron County MPO, along with the RMA and the City of Matamoros, and the state of Tamaulipas in Mexico have worked in

partnership with the railroads to develop the West Rail Relocation Project. The project will relocate railroad traffic to a new international bridge located west of Brownsville and it will eliminate rail traffic out of the city centers of Brownsville, Harlingen, and Matamoros, and allow trains to travel at faster speeds. A presidential permit was issued by the U.S. in 2004 and investment is being done on a 50/50 match with Mexico providing \$20 million dollars to the project.

El Paso Rail Relocation

El Paso is a city in which most of the rail traffic that moves through it does not originate or terminate in the city but rather moves through to other destinations. El Paso is the gateway for the UP's southern transcontinental route, which links the Ports of Los Angeles and Long Beach to Chicago. Furthermore, according to Chuck Kooshian of the City of El Paso (Kooshian 2007), there are three cross-border (north-south) trains per day from Mexico, which connect primarily to the Burlington Northern Santa Fe (BNSF) route. While El Paso has temporarily sought relief from rail congestion by placing restrictions on when trains can operate, the longer term solution is to shift the north-south traffic to alternative corridors that do not run through the city. This is being accomplished in coordination with the City of Juárez in Mexico.

SAFETEA-LU specifically called for a new rail crossing at Santa Teresa in New Mexico to ease congestion; however, the realization of this federal mandate is dependent in large part on full participation by Mexico (Camino Real Border Improvement Plan, EIP MPO). The El Paso MPO reports that for a project of this sort, funding from the Mexican side will be allocated across different entities with 25% coming from each of the following: federal, state, local, and the private rail company (Ferromex). To add to the complexity of the process, the line will be relocated onto the territory of New Mexico, which means that the New Mexican side must also be a full participant. According to George Pinal at the El Paso MPO, Texas has so far taken a more passive role in the process when compared with either Mexico or New Mexico. While El Paso representative Silvestre Reyes spearheaded the effort to secure \$14 million of federal money to fund the study and preliminary engineering for the project, the New Mexico DOT (Rolmo, 2006) has taken a more active role in planning due to the comparatively simpler process of acquiring the necessary right-of-way and the potential direct economic benefits that would accrue to New Mexico. For the leaders of El Paso and Ciudad Juárez, the relocation is a prime opportunity to remove rail congestion that is hampering connectivity in their cities. One unique consideration in El Paso's relocation effort is that the new corridor will primarily be located in another state (New Mexico) on land that is partially owned by the federal government (Bureau of Land Management). The addition of a new intermodal facility and ramp near Santa Teresa is expected to generate significant numbers of jobs for New Mexico and is actively being planned by the New Mexico DOT. If cross-border projects such as these can be realized, they have the potential to provide benefits to all sides.

Chuck Kooshian described the unique characteristics of rail planning in El Paso given the role of Mexican and New Mexican policies. For example, El Paso benefits from a policy to allow north-south trains connecting to the BNSF only at night; this policy was initiated and enforced by Ciudad Juárez. The military, which may construct a rail spur to support expansions at Fort Bliss, also operates as yet another independent actor whose decisions impact the City's overall plan.

Other border states have also been actively involved in developing coordination with their Mexican counterparts. In the case of Arizona, the Arizona-Mexico Commission (AMC) is Arizona's cross-border nonprofit organization set in motion in 1959 by Governor Fannin. The

AMC has evolved considerably over its 44 years. Its vision of improving quality of life in the region promotes a strong, cooperative relationship with Mexico; facilitates the movement of goods, services, people, and information through Mexico and Latin America; and encourages security and sustainable development within our border communities (AMC, 2008).

In connection with border transportation planning, one of its greatest achievements was the creation of the Border Infrastructure Project database (BIP) in 2006. BIP is a single source of information on Arizona's border infrastructure projects. It tracks each project's progress along its approval, programming, and funding paths and provides the information in a concise and timely way.

In the case of New Mexico, in 2003 this state committed U.S. \$800,000 for a variety of border projects designed to stimulate trade, increase New Mexico suppliers for the Maquilas, increase border security and cooperation, and increase the ease of travel for Mexican visitors to New Mexico. U.S. \$100,000 were specifically allocated to conduct a study related for state transportation and facilities planning at the Santa Teresa port-of-entry which will relieve the ports of entry in El Paso, TX (Office of the New Mexico Governor, 2003).

Mexico's Budgetary Process for Transportation Development

Infrastructure development process (planning, selection, approval, and implementation) is tied to the budgetary rules and structure of the federal, state and local governments. Oftentimes lack of coordination for development of potential binational projects is derived from misalignments and lack of proper understanding of the respective planning and budgetary processes in both countries. The objective of this section is to present an overview of Mexico's Federal Budget process, its interaction with state and local governments, as well as the way infrastructure projects are included and financed.

In the first section we talk about the nature of Mexico's public finance structure and describe the process of budget submission and approval. In the second section we talk about the legal framework and mechanisms of revenue and budget sharing between the Federal and state governments and we describe some other regulatory elements. Finally, we talk about the financing of infrastructure projects and the creation of some dedicated investment funds.

Public Finances and Budget Creation

In Mexico, a very high proportion of tax revenues are levied by and directed to the Federal Government. Mexico's Federal taxes include income, value added and excise taxes, as well as import duties and some fees. States and local governments (*municipios*) have little revenue raising power. This is usually limited to a state payroll tax (which cannot exceed 2%), property tax, and fees for services (including driver's licenses and some vehicle registration fees). Through different mechanisms established by law, namely the 'Fiscal Coordination Law' that will be described in the next section, the Federal Government gives back to states and municipalities a share of the total revenues raised.

Mexico's Federal Government revenues are highly dependent on oil production and exploration. Through a combination of excise, corporate and special taxes levied on the state owned oil company Petróleos Mexicanos (PEMEX), the Federal Government makes almost 40% of its total revenues. In the recent past there have been several attempts to decrease the Federal Government's dependence on oil revenues. A new tax reform was passed at the end of 2007, which will make modest improvements in this respect. It is worth noting that the great majority

of oil revenues go to the general revenues fund helping to finance the overall budget and not to any dedicated sector.

The Constitution and several other Federal laws, auxiliary laws and regulations, regulate the Federal budget process. Articles 74, 75, 126, 127, and 134 of the Federal Constitution provide the framework for the process of creation, submission, revision, and approval. The “Federal Budget and Fiscal Responsibility Law” issues specific directives for the application of the federal budget once Congress has approved it. Directives related to the calendarization, transparency and certain tender provision are among those included in the referred law. The “Fiscal Coordination Law” gives the legal framework for the sharing of fiscal revenues and budgetary appropriations between the Federal Government and the states.

Mexico’s budgetary process is in appearance not that much different from the one followed by the United States. There are many differences in details however, due to the different legal systems and intrinsic political and historical traditions. One of the key differences between the two countries is the timeline of submission and execution of the budget. Unlike the United States, in Mexico the fiscal year coincides with the calendar year. This difference should be kept in mind for coordination purposes.

Mexico’s Federal Budget has two components: Revenues Law and the Federation’s Expenditure Budget (PEF).¹⁸ These two components are submitted and approved by separate votes but both are part of the overall budget. Article 74 of the Federal Constitution describes the timeline and process of approval. Figure A6 shows this process.¹⁹

¹⁸ The Federal Budget’s official name is *Presupuesto de Egresos de la Federación* and the PEF abbreviation is commonly used in most official documents, hence our choice to use the Spanish abbreviation.

¹⁹ In Mexico the legislative process can be initiated either by the lower or the upper chamber, as in the United States, and upon approval by the originating chamber the bill is referred to the revision chamber. The Constitution establishes that certain kinds of bills need to be initiated in the Senate and others in the Deputies chamber (the Revenues Law is one example of the latter) or by either in absence of a specific indication.

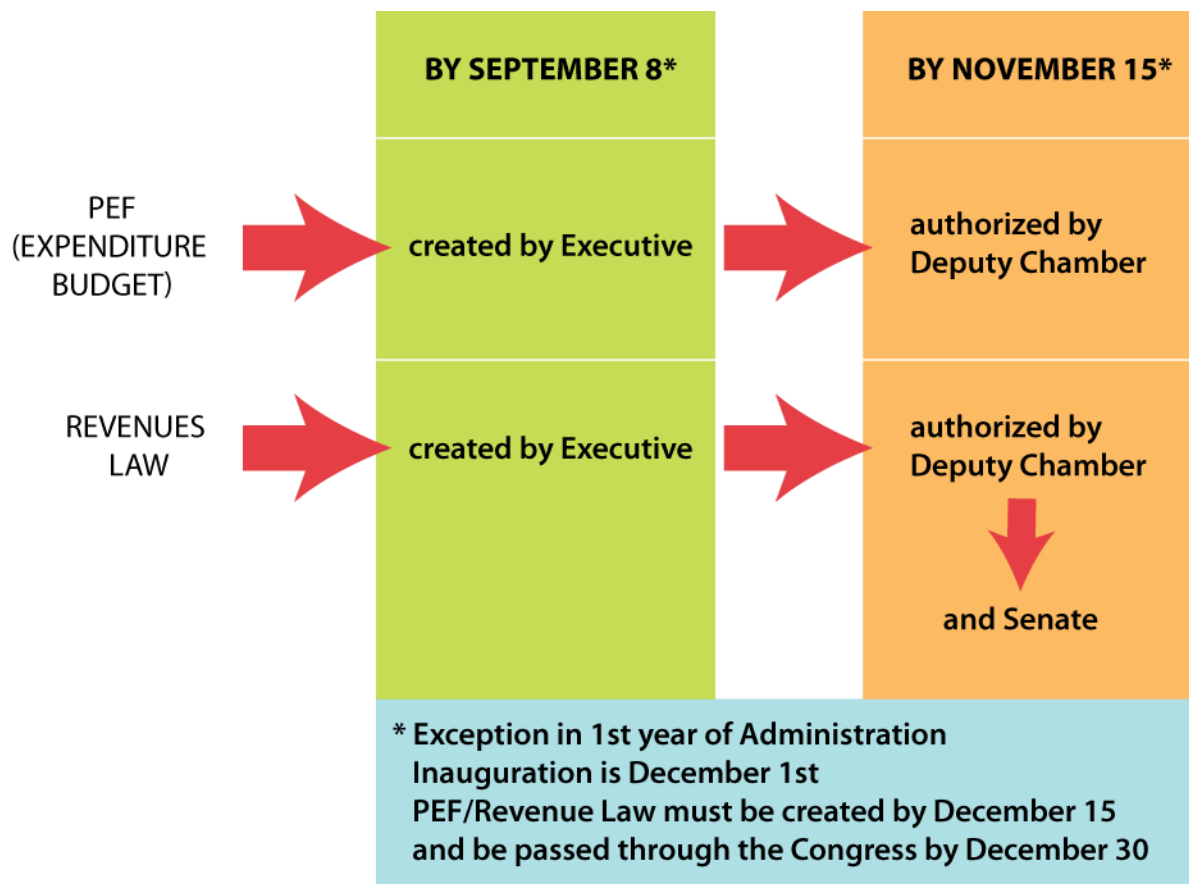


Figure A6: Mexico's Budget Development Timeline and Approval Process

While there are specific laws and regulations regarding each of the federal taxes mentioned earlier in this section (Valued Added Tax Law, Income Tax Law, Products and Services Special Tax Law (excise), etc.), the Revenues Law is the Congressional authorization Act that allows the Executive to be able to levy those taxes each year. This Revenues Law includes any special or temporary provisions (like temporary credits for example) that would be applied in a determined year.

As indicated before, Mexico's federal revenues are highly dependent on oil production. However, oil extraction rates have fallen in recent years. This is partially because the Constitution of Mexico reserves the right to exploit oil resources to the state (Harrup, 2009) and has led to no direct foreign investment in exploration and extraction in Mexico. PEMEX's ability to find and develop new sources of oil has been hindered because such a significant portion of the company's profits are given directly to the federal government instead of being reinvested in exploration activities. If PEMEX profits exceed expectation in a given year, then the government takes the additional money as revenue, but if PEMEX profits decline, it often leads to a budget cut for the company in order to make up for shortfalls elsewhere in the federal budget. This has led to severe underinvestment in exploration and development of new fields that is compounded by the inability to partner with foreign firms in the oil industry. Because of this lack of investment PEMEX lacks the technology necessary to develop many of its deepwater fields, and since foreign investment in the oil sector is constitutionally forbidden, the country cannot partner

with a big oil firm to gain such technology. As a result, oil outputs are falling with little hope for expanding production (Blank, 2008).

This is problematic for Mexico because the country's oil reserves have been falling steadily. Investment in production of oil has not been sufficient to increase or even maintain extraction rates and consequently oil output in May of 2009 fell to its lowest under normal conditions since 1993 (Lange, 2009). Compounding Mexico's difficulty in developing additional oil fields are falling oil prices. Even if Mexico increases investment sufficient to maintain production output, revenues generated from output will be significantly lower than last year due to the decline in the price of oil. This means an overall decrease in funds available to the Mexican government. According to the Mexican Finance Ministry, revenue in the January–May 2009 period fell 6.9% from the same period of 2008, with oil income down 24% and non-oil tax collections down 15% (Harrup, 2009).

There have been several attempts to decrease the federal government's dependence on oil revenues, tax reforms passed at the end of 2007 will make modest improvements in this respect. There are also currently discussions underway regarding a constitutional energy reform that would allow for external or private sector investment in Mexico's energy sector. This is a politically difficult subject in Mexico, as PEMEX and the nation's oil are seen as a birthright to be shared among all Mexican citizens. There is keen political opposition to foreign investment in the sector (Blank, 2008). Political considerations aside, the proposed reforms still fall short of what is likely needed to maintain Mexico's oil output and support the federal budget because they do not allow foreign investment equity shares in exploration and extraction projects. The proposed reforms only allow PEMEX to compensate foreign oil firms for their services in cash, a much less attractive deal for potential foreign investors (Harrup et al., Anthony. 2009).

If Mexico is able to implement reforms for PEMEX, they will need additional fiscal reforms to support the federal budget, which are likely to include unpopular tax hikes. Tax revenues as a percentage of GDP are only about 12% in Mexico, much lower than the OECD average of 36% and lower even than the Latin American average of 17% (Hausmann, Ricardo, 2009). Mexico did approve a fiscal reform bill in 2007 that is expected to increase tax revenues by 2% before the end of President Calderón's administration in 2012. While this reform was viewed by the Calderón administration as a positive development, it was not as aggressive as originally envisioned and lacked reforms to some tax exemptions that have been used for tax evasion. An overhaul of the tax collection laws will be instrumental in reducing the federal budget's dependence on oil revenues if, as is expected, oil output continues to decline (Lange, 2009).

Taxes and Fiscal Coordination

As mentioned earlier, Mexico's government is highly dependent on oil revenues and its tax revenues are low compared to other countries of the Organization for Economic Cooperation and Development (OECD) and other Latin American nations. Mexico's government revenues as a percentage of Gross Domestic Product (GDP) are around 19%, compared to around 25% for the U.S. (Table A8).

Table A8: Mexico and U.S. Tax Rates

	Mexico	U.S.
Top Marginal Personal/Corporate Income Tax	28%	41.4, 35%
Top Tax Rate on Dividends	29%	35%
Value Added Tax (VAT)	15%	None

Mexico collects considerably less tax revenues than the United States even though the federal income tax rates are not considerably lower. There have been a few proposals to expand the currently limited authority that states have to levy payroll taxes. Mexico also has a 15% Value Added Tax that the United States does not have (OECD 2007). This low level of tax revenues is one of the main causes of a lower level of investment in infrastructure. The Valued Added Tax and the Income taxes (both individual and corporate) are levied by the Federal Government.

The Products and Services Special Taxes (IEPS) which taxes alcohol or alcoholic beverages, tobacco and tobacco products, and fuels also provides the states with revenue. The IEPS Law establishes the percentages that state governments can take from the taxed products.²⁰ However, very few states, if any, get the tax participation prescribed by the IEPS Law since they adhere to the Fiscal Coordination Law (FCL) created in 1979.

The FCL created a system by which states give away their rights to obtain the above-mentioned percentages (and some other fees) in order to be eligible to receive direct transfers from the federal government. Those transfers come from the general revenue fund. The fiscal coordination system has been evolving since its inception in terms of the eligibility conditions, mandates, amount of funds, provenance of such funds, and evaluation systems.

If the states sign up to the fiscal coordination system (which hitherto all of the states have done) they forfeit their participation on specific excise taxes levied in their territories, but gain access to the general participations fund. The FCL guarantees that 20% of all the general government tax revenues are distributed back to these states. This includes all levied taxes as well as oil and mining extraction license revenues.

The FCL established a formula to allocate resources between the states: 45.17% are apportioned strictly as a proportion of their population. Another 45.17% are allocated through several formulas taking into consideration social development objectives and indicators. The remaining 9.66% is apportioned in inverse proportion to the states' population.

Despite these difficulties, the federal government has proposed a number of times to allow states to include an up to two percent sales tax on top of the Federal VAT. No state took advantage of this allowance. Most states rely on the federal government's transfers and other locally levied taxes, for example property taxes. The FCL has a number of provisions to force State, and more precisely, local (*municipal*) governments to improve their property tax collection. There is also a provision to allow local governments' access to a minor fund for maintenance of toll bridges operated by the federal government.

The Mexican government collects taxes for new vehicles as well as an annual vehicle registration tax. These are federal taxes (although the registration tax is administered by the states) and are not included among the 20% of general funds redistributed to states. States have the option to get back a percentage of the vehicular taxes if they sign separate agreements with

²⁰ Producing states can obtain 2% of the tobacco tax, 2.8% of the beer tax. States can obtain 44.5% of the beer tax revenue assessed when consumed in that state, 18% of the tobacco tax and 10% of the fuel tax.

the federal government. Currently those agreements are related to the responsibility of state governments to build and maintain a vehicular registration database.

While Mexico legally has a federal structure very similar to that of the United States, in practice the Federal Government has always had considerably more power. This is evidenced by these taxation differences. There have been very few proposals to expand the limited payroll tax that some states have. Since Mexico has a Value Added Tax (VAT), states cannot have a final sales tax as happens in the United States. Given its nature, a VAT usually needs to be assessed and collected by a federal or central government and it is not easy to determine how much was exactly generated by any given state.

Despite these difficulties, the federal government has proposed a number of times (this was one key component on the failed tax reform presented by the former Vicente Fox administration) to allow states to include an up to 2% sales tax on top of the Federal VAT. No state took advantage of this allowance since it would affect governors politically. Most states rely on the federal government's transfers and in other locally levied taxes like property taxes. The Fiscal Coordination Law has a number of provisions to force state, and more precisely, local (municipal) governments to improve their property tax collection. There is also a provision to allow local governments' access to a minor fund for maintenance of toll bridges operated by the federal government.

As a consequence OECD has recommended (OECD 2007) that no increased transfers should be given to state governments until they improve and increase their local revenues. It also raised the question of "lack of accountability" of state and local governments, especially related to funds associated with social infrastructure investment projects financed through transfers from the federal government. While the Fiscal Responsibility Law has substantially improved the oversight (as is explained in the next section), OECD considers that there are still many actions to pursue and gives some recommendations. Among these is included a recommendation to renew the ability of states to levy final sales taxes (as has been offered in the past), make the vehicle property tax a state level tax instead of federal and create incentives for the states and municipalities to strengthen their revenue capabilities. Historically, because there was— and still is— significant variability in terms of quality of planning, budgeting, execution, and oversight between the different states and municipalities this has been one of the factors that have impeded the successful implementation of infrastructure programs.

Budget Execution

A budgetary impasse in 2005/2006, in which Congress approved the PEF after the deadline, prompted the Mexican government to issue a series of changes in March 2006— including creating the Federal Budget and Fiscal Responsibility Law (FRL) which is now part of the main regulatory framework of the Federal Budget. This Constitutional change amended the budget's submission deadlines by the executive to September 15, instead of November. During the past 20 years, Mexico's federal government has improved PEF's oversight by issuing a series of directives and creating better practices. Many of the directives were also integrated and improved in the FRL in March 2006, to strengthen the overall fiscal framework.

Among the elements that are included in FRL is the confirmation of a strictly 'pay as you go' system, with no unfunded mandates. Every single new proposal to increase or create specific programs needs to include a direct new source of financing or a compensating expenditure offset in another program. However, it should be noted that Mexico has run a deficit this past year to counteract the global financial crisis. The FRL approach also reinforces the practice of using

non-recurrent or non-renewable resources (as the ones from increased oil revenues should be considered) to non-recurring projects such as infrastructure projects. The new directives also put more emphasis on multiyear budget planning and considerations for infrastructure programs and eliminated the need for annual reauthorization. In this way, the Mexican government is attempting to give more continuity to ongoing projects and more certainty to new ones.

Another element of the FRL is a very explicit set of guidelines to assign resources to the four specific funds: States Revenue, Oil, PEMEX Investment Stabilization Funds, and for specific infrastructure projects, and how these are used. These four funds are not created through regular or dedicated tax or oil revenues. The funds are endowed by extra oil and tax revenues. Figure A7 shows how these extra revenues are disbursed and allocated.

In all of these various apportionments it should be noted that infrastructure— refers to all infrastructure development— water, energy, communication, social projects (e.g. schools and hospitals), and transportation. Transportation infrastructure, therefore, competes against many other projects on an ongoing basis.

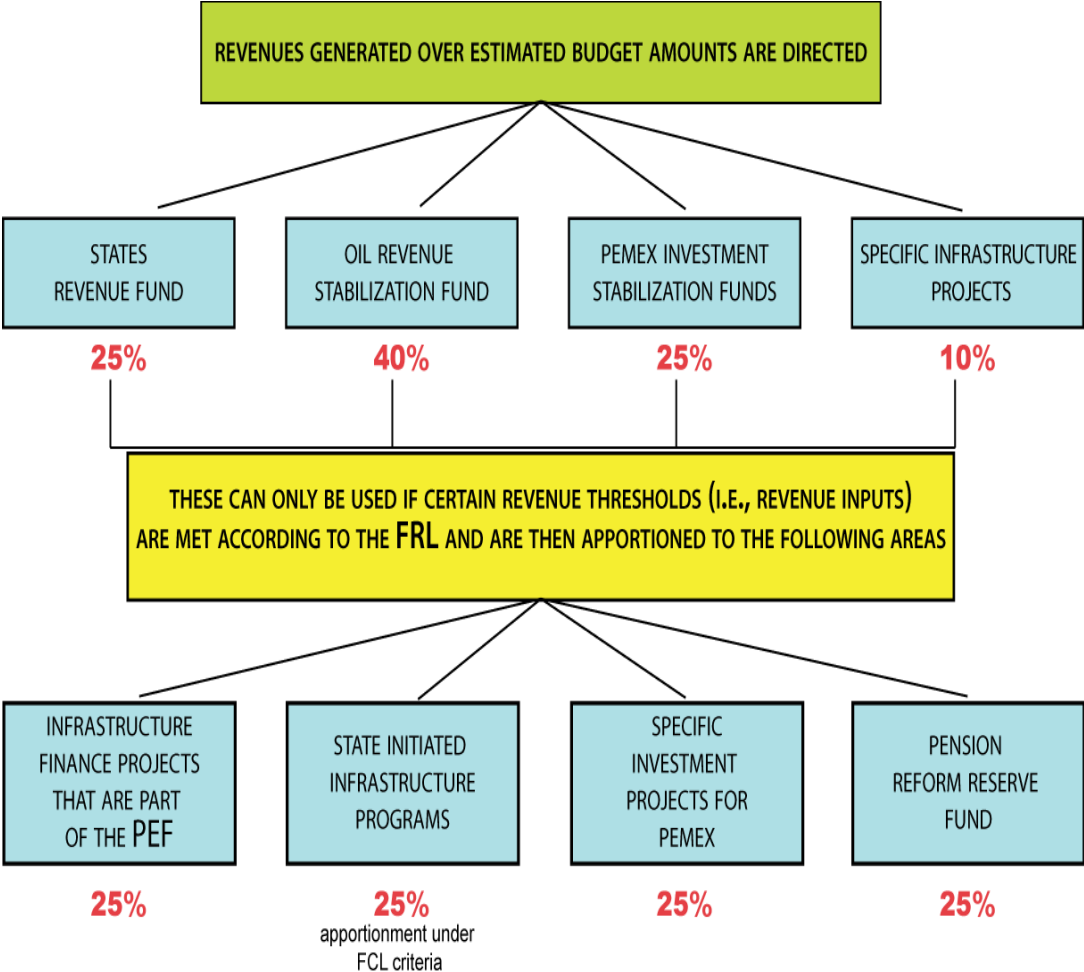


Figure A7: How Revenues over Budget Estimates are Directed in Mexico

Infrastructure Project Finance

There are specific budgetary considerations regarding infrastructure projects. The FRL allows and establishes multiyear commitments (Articles 32 and 50). The ‘pay as you go’ system for productive investments is further enshrined in Article 18 of the Public Debt Law. Article 34 of the FRL establishes a procedure that infrastructure projects must follow to be considered in the budget proposal and as well as the criteria for project selection.

Each government agency needs to present a detailed project management program in which the infrastructure projects, along with a full technical and economic impact analysis, are included. State governments can also present projects to be included in the PEF. The authorization process includes a detailed analysis by an intra-cabinet committee (the expenditure-financing committee) which is required to consider four criteria in its deliberations. These are:

1. Socio-economic profitability;
2. Extreme poverty reduction;
3. Regional development; and
4. Complementarily with other projects.

The Mexican government has planned to finance infrastructure projects from three sources of funding: PEF, Asset Proceeds, and PPP projects. Asset Proceeds sources come from the concession of existing assets – monies raised are used for debt repayment and construction of new projects (typically through new private concessions). PPPs include the construction of every new project or a direct participation of private sector in enhancement of existing ones.

Public-Private Partnerships

One of the most frequently used methods for infrastructure financing in Mexico is the Build-Operate-Transfer (BOT) PPP model, especially in the highway sector. The BOT model allowed Mexico to expand its privatization programs by allowing private investment capital to play a substantial role in infrastructure financing. This in turn released funds and financial pressure off the government enabling the construction of much needed social and environmental infrastructure (Eaton, 1997). Under the BOT model, private companies secure an exclusive license from the government to collect revenue and construct, manage, and operate a project for a fixed time frame (Eaton, 1997). After the established time frame, the facility and its assets are transferred back to the Mexican authority. Articles 25, 27, and 28 of the Constitution outline the general principles that create the Mexican concession regime as well as provide authority to grant a concession.

Mexico’s government also restarted a new process of privatization of highways after almost all of the highways that were under concession in the 1990’s went bankrupt and fell back into government’s hands. The severe liquidity and solvency problems faced by private toll road companies after the 1994–95 financial crisis led to a government rescue effort in August 1997. This was achieved through the use of a trust fund established within the National Bank of Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*, BANOBRAS) called Trust for Supporting the Recovery of Licensed Highways (*Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas* FARAC). As a result of the rescue operation, the trust fund acquired both the assets (the toll roads and the income stream generated by the tolls levied) and the liabilities of the toll road companies. Part of the bank debt of the toll road companies was restructured into long-term UDI-denominated Notes (Pagarés) under the different debtors’

support program in place before August 1997 (Giugale, et al., 2001). As of March 2007, FARAC's debt, as guaranteed by the federal government, amounted to MXP \$165 billion (Aguilar, 2007).

FONADIN

On February 6, 2008, Mexico's Federal government unveiled the creation of a new National Infrastructure Trust Fund (*Fondo Nacional de Infraestructura*, FONADIN) with a starting endowment of close to US\$4 billion. This Fund was announced as part of the federal government's fiscal policy in response to a slowdown in economic activity. The fund was formed by the merger of two existing funds plus an additional influx of fresh resources from the concession package that was awarded to ICA/Goldman Sachs. The existing funds amalgamated into the FONADIN were FARAC and the Infrastructure Investment Fund (*Fondo de Inversión en Infraestructura* FINFRA).

Mexico is seeking to insulate infrastructure funding from the current economic crisis through FONADIN. FONADIN is funded through concessions let out of FARAC of roadways currently held by the government and new infrastructure concessions, and the money is then used to fund projects not suitable for private investment, such as the Mazatlán-Durango highway. FARAC holds an estimated \$35 billion in toll road concessions. These will be developed over the next 5 years through eleven separate concession packages. (Hayward, Nov 2007). The first tender raised \$4.8 billion for FONADIN (Hayward, April 2009). The government hoped to add additional money to the fund with the concession of the FARAC II package, known as the *Paquete del Pacífico*. However, when the call for bids on the FARAC II package was released it failed to generate significant interest, and the two bids received did not meet the minimum price requirements. The government tender call was declared void by SCT and the package was consequently split into two separate tenders. The first tender of this split, totaling \$2.5 billion, was released in April 2009 (Hayward, April 2009).

The revenues directed into FONADIN will be used to finance infrastructure projects that cannot be structured as a PPP type project as well as towards paying off a portion of the debt accumulated by FARAC. The process through which the federal government directs the funds received from the new concessions to the construction of new highways or other infrastructure projects is called Asset Proceeds scheme. It is an important portion of the financing of the projects included in the NIP.

After the highway bailout process of the 1990s, the Mexican government has taken steps to clarify regulations related to PPP's. While there are variants of PPP's in different infrastructure projects and assets like airports and ports and some exploratory attempts in hospitals and schools, the main focus remains in highways.

The Mexican government has presented new guidelines for the Asset Proceeds and Concession schemes mentioned above. Among some of the innovations are the use of longer terms (30 years) for highway concessions, determination of second place when a winner is announced (the second place would be the substitute for the project if something goes wrong) and determination of rules for public co-investment (SCT, 2007).

While there has been considerable improvement through the issuing of guidelines, PPP regulations are still part of a collection of specific articles in several other regulations and laws. Mexico's Finance Ministry (*Secretaría de Hacienda y Crédito Público* SHCP) has recommended the consolidation of such regulations and the creation of a dedicated entity to regulate and monitor the different PPP projects.

Calderón National Infrastructure Program

As mentioned in the planning section earlier, the Mexican government is required to develop a NDP (which can include long-term planning processes). Felipe Calderón's administration in 2006 presented its long-term strategic vision document named "Mexico 2030." The document stressed the need for improved infrastructure is critical for long-term economic growth objectives. The NDP consisted in formalizing the vision presented in "Mexico 2030."

The administration of President Felipe Calderón made clear its intentions to privilege (or fast-track) the construction and completion of infrastructure projects with a long-term strategic plan. In the summer of 2007 it released the National Infrastructure Program 2007–2012. There are several drivers behind this initiative. One is, as mentioned before, the previous inability to maintain a sustained rate of investment in the sector. The other main driver is to improve Mexico's competitiveness indicators. The National Infrastructure Program presented in July 2007 includes over 300 strategic projects in transportation (highways, ports, airports, rail, and multimodal) as well as in telecommunications, energy production and distribution, and water and irrigation projects. In the following months, as established by the National Development Plan, the administration has issued specific Sectoral Plans. The one for SCT, released in November 2007, includes the bulk of projects in the National Infrastructure Program with the exception of the energy and water sectors. The Sectoral Plan needs to include a series of indicators that will help in the evaluation of the objectives of the National Development Plan and the Infrastructure Program over the 5 years of its lifespan. Concurrent with the NIP, SCT issued the "highway program 2007–2012." The program included 100 strategic projects that will be developed during that NIP timetable.

The NIP objectives are to: improve coverage, quality, and competitiveness of infrastructure; make Mexico into an international logistic platform; increase access to public services particularly in areas of greatest need; promote balanced regional development with special emphasis in the south and southeastern regions; encourage sustainable development and employment and build tourism oriented infrastructure.

The NIP established some strategies and objectives for the successful implementation of the substantially increased amount of public and private resources projected to be put into these infrastructure projects. These include:

- encourage the authorization of multi-year investment projects;
- improve planning, preparation, administration, and execution of projects with best practices and standards;
- solve problems related to the acquisition of rights of way and simplify environmental authorization formalities;
- actively promote PPP's and strengthen their legal frameworks; and
- and eliminate unnecessary regulations and inhibitors to investment and improve coordination among the three levels of government.

The NIP-proposed project investments are based on three scenarios dependent on the success of tax and other economic reforms. The scenarios are:

- Inertia (if no tax or other reform proposals are approved),

- Base (only tax reforms approved – used as default scenario), and
- Outstanding (tax and other structural reforms approved).

Table A9 compares the scenarios and shows their range of indicators:

Table A9: Comparison of Scenarios and Range of Indicators in the NIP

	Annual Investment (% GDP)	Total Investment 2007-2012 (Billions US\$)	Tax Initiative(s)
Inertia	2.0 - 3.0	150	Tax Reform fails
Base	3.0 - 4.5	226	Half of Tax reform proceeds
Outstanding	4.5 - 6.0	301	Significant increase in public and private investment

In December 2007 the Mexican Congress approved, with some modifications, President Calderón’s proposed tax reform. The reform’s main features are the creation of an alternative minimum tax and closing of loopholes that will allow the government to increase tax revenues up 2% of GDP. While the approval of the tax reform alone would elevate the revenue raising ability from the inertial to the base scenario, the economic slowdown that occurred during 2008 has led to a situation that is closer to the inertia scenario. On the other hand, the estimate of infrastructure need was based on pre-recession estimates of growth, therefore while revenue has been reduced, it is possible that projects thought to have been urgently needed prior to the recession are now viewed differently.

Trade dependent projects, such as the proposed port of Punta Colonet, fall into such a category. Despite being prominently featured in the NDP, the project has not been placed out to bid. Other projects that have been impacted by lower revenues plus lower demand forecasts include the second and third line of the commuter rail in Mexico City. The latter has had to be reworked because of lower than estimated private-sector proposals. The Calderón administration was moving to implement structural reforms related to the energy sector and labor markets that it argued would help in the path towards the most optimistic revenue scenario, however the combination of falling energy prices and the loss of the PAN’s majority have lowered ambitions for implementing the President’s reforms.

The 2008 Budget approved by Congress included slightly less than US\$4 billion for highways and roads. This amount falls just slightly below what is needed to achieve the base scenario projection. Table A10 compares the accumulated investment in U.S. \$Billions in the transportation and telecommunication sectors under the three scenarios.

Table A10: National Infrastructure Plan Modal Investment Scenarios

Mode	Inertial	Base	Outstanding
Highways	\$14 billion	\$26 billion	\$37 billion
Railways	\$3 billion	\$4 billion	\$8 billion
Ports	\$4 billion	\$6 billion	\$10 billion
Airports	\$2 billion	\$5 billion	\$7 billion
Total Transport	\$23 billion (15.3%)	\$41 billion (18.1%)	\$62 billion (20.6%)

Concluding Remarks

Economic literature has documented cases in which participation of government in the economy might be necessary and justified. The most common examples of government participation have included situations when there are insufficient tax revenues, when the size of the market is insufficient to maintain a competitive structure, or when private investment is unavailable (Franck, 2000). Some of these conditions were present in Mexico during the first decades of the 1900s and led the government to participate in capital intensive industries, such as railroads, ports, airports, and highways.

In Mexico, government participation expanded as nationalistic rhetoric grew: this led the government to distort the purpose of government participation (Franck, 2000). The government acquired ownership of airlines and other unrelated businesses. The result was that the government owned sectors which had no unifying strategy, and economic resources were diverted to subsidize state owned enterprises. Nationalistic rhetoric also prevented private investment in many areas of the economy, resulting in the government running up a considerable external debt to finance investment in those areas (Franck, 2000).

The former head of the privatization program in Mexico used an anecdote to illustrate the folly of indiscriminate government participation in the economy (Franck, 2000). When the government subsidized Aceros Monterrey, a steel company, 5,000 jobs were saved. However, 10,000 jobs could have been created if, instead of subsidizing Aceros Monterrey, the government had wisely invested the same amount of money in another area of the economy, such as highway development or other infrastructure projects. Such an investment would have doubled the number of highways in Mexico (Franck, 2000). By rescuing failed enterprises, the government contributed in the creation of a culture with a lack of accountability among certain groups in the private sector.

As Mexico enters the new century, much has been accomplished in the areas of privatization and deregulation of transport activities (although the agenda is far from completed), and important inroads are being made in the process of decentralization. Among the main accomplishments are (Pokorny, 2001):

- The privatization of the Mexican railways, which started in 1995, is complete, and the efforts were successful in achieving its main objectives of promoting competition and ensuring financial sustainability
- The reform of the country's port system was also highly successful in achieving its objectives of (a) decentralization, granting each port the autonomy to be managed according to its cost and demand conditions; (b) privatization, through the introduction of

private operators, and eventually even the selling of the port administration; and (c) liberalization of tariffs and promotion of a competitive environment

- There has been a substantial deconcentration of road maintenance responsibilities to SCT's regional offices and an increased use of contracted maintenance
- SCT, SCHP, and BANOBRAS have taken decisive steps to restructure the debt of the concessioned roads

Today, the government's intervention during many decades is reflected in the lack of transport infrastructure in Mexico, barring growth and development. Even if major upgrades have been made to Mexican port facilities, as long as the rail and road networks linking the ports to the rest of the country remain below par, improved port facilities in and of themselves will make little difference (Nolan, 1999).

With the new laws enacted, shortly before and after NAFTA was executed, across all transport subsectors—roads, rail, airports, ports, and multimodal—there is a need for greater support for supervision and regulation of the sector in light of the commitments made by the government to private operators, consumers, and taxpayers.

The Mexican crisis of 1995 has had major consequences for project finance for the country's transport infrastructure since it led to extreme uncertainty about traffic levels and revenue-generation capacity. The infrastructure needs in all sectors mean that public finances are insufficient to fund all such projects. Mexico therefore needs to develop new ways to facilitate private investment, to rethink the role of the government in the financing of transport projects, and to develop appropriate financing instruments (Pargal, 2001). Options include:

- Expanding the legal ability of international investors to own majority stakes
- Enacting law related to new forms of public-private partnerships
- Develop an efficient infrastructure fund
- Improve international efforts regarding transportation planning to also include ports, airports, and railroads, not limiting its activities to road transportation

SCT still needs to adapt to a sector that has experienced a deep transformation, with the privatization of the railways, the decentralization and privatization of ports, and the concessioning of roads. SCT has yet to change its culture into an institution that oversees policy, planning and regulations, sets norms and standards, oversees integration and harmonization of legislation with trading partners, and makes full use of new technology to encourage trade facilitation.

Lack of planning coordination among the several government agencies having jurisdiction within a geographical or sectoral area, like transportation infrastructure, is also hampering the possibility of taking action through coherent policies that could promote integral transport services.

Thus, the biggest challenge is the need for sectoral institutions, in particular SCT, to adapt to its changing role from a builder, operator, and provider of services to an effective planner, manager, and promoter of transportation infrastructure projects. Planning regulation and supervision are currently spread over too many entities. There is great need to clarify the jurisdiction of the agency and the division of responsibilities between planning agencies regarding transportation planning.

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Ley de Caminos, Puentes y Autotransporte Federal

Ley de Coordinación Fiscal

Ley de Expropiación

Ley Federal de Presupuesto y Responsabilidad Hacendaria

Ley del Impuesto Especial sobre Producción y Servicios

Ley de Inversión Extranjera

Ley de Puertos

Ley General de la Administración Pública Federal

Ley General de Equilibrio Ecológico y la Protección al Medio Ambiente

Ley General de Vías de Comunicación

Ley Reglamentaria del Servicio Ferroviario

Ley Sobre Planeación General de la República

Lineamientos Generales para la Apertura del Servicio Ferroviario

Memorandum of Understanding (MOU), establishing the federal Highway Administration's Joint Work Committee (April 1994 & October 2000)

Normativa para la Infraestructura del Transporte

North American Free Trade Agreement

Plan Nacional de Desarrollo 1989-1994

Plan Nacional de Desarrollo 1995-2000

Plan Nacional de Desarrollo 2001-2006

Plan Nacional de Desarrollo 2006-2012

Programa Carretero 2007-2012 y sus 100 proyectos estratégicos

Programa Nacional de Infraestructura 2007-2012

Programa Sectorial de Comunicaciones y Transportes 2007-2012

Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Evaluación del Impacto Ambiental

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APPENDIX B: National Infrastructure Plan

Highways

The NIP establishes the following strategies related to the construction of highways: Complete the modernization of the transversal and longitudinal road networks, that is, the national corridors—one of the main pieces was the completion of the Durango-Mazatlán highway mentioned before. Another objective is to build inter-regional roads to improve communication among regions and improve the connectivity of the highway network. There is also special emphasis on the construction of bypasses and access roads as well as improvement in the physical conditions of all highway infrastructure.

The Inertia scenario considers the construction and modernization of around 6,700 kilometers (4,163 miles) of highway by the end of 2012. The Base scenario considers 12,260 kilometers (7,618 miles) of construction and the Outstanding scenario around 17,598 kilometers (10,934 miles). The Base scenario includes the 100 strategic programs that were outlined in the Highway Program of July 2007 and the outstanding one builds over the completion of base plus new projects.

The highway program established a detailed plan for the development of the 100 strategic projects chosen by the Calderón administration. Of the US\$26 billion projected investment, it gives a little over \$20 billion to the completion and building of roads and the remainder for conservation and rights of way provisions. The program also details the expected sources of funding for the 100 projects. Almost half of the funding (47 %) will come from the federal budget PEF. Around 28 % is projected to come from the Asset Proceeds and the balance through new Concessions.

The program indicates that all the funding for intra-state roads and rural and feeder roads will come exclusively from PEF while the other projects are divided between the sources. The 100 strategic projects were chosen under the following criteria:

- cost-benefit analysis;
- improvement in connectivity of centers of high population, ports and borders (that is, projects that have high visibility);
- strengthening of networks without proper levels of connectivity, especially the southeastern region;
- completion of gaps in the main highway network;
- support of tourist destinations; and
- availability of enough technical, legal and financial elements for a project, i.e. projects that are ready for implementation and had feasibility and other studies already underway or completed.

Figure B1 shows the national corridors as at 2006 and Figure A2 shows how the proposed highway network will look in 2012.

National Corridors in 2006



Source Figures B1 through B7: National Infrastructure Program 2007–2012

Figure B1: Mexico's Highway Infrastructure Network in 2006

Infrastructure in 2012^{1/}

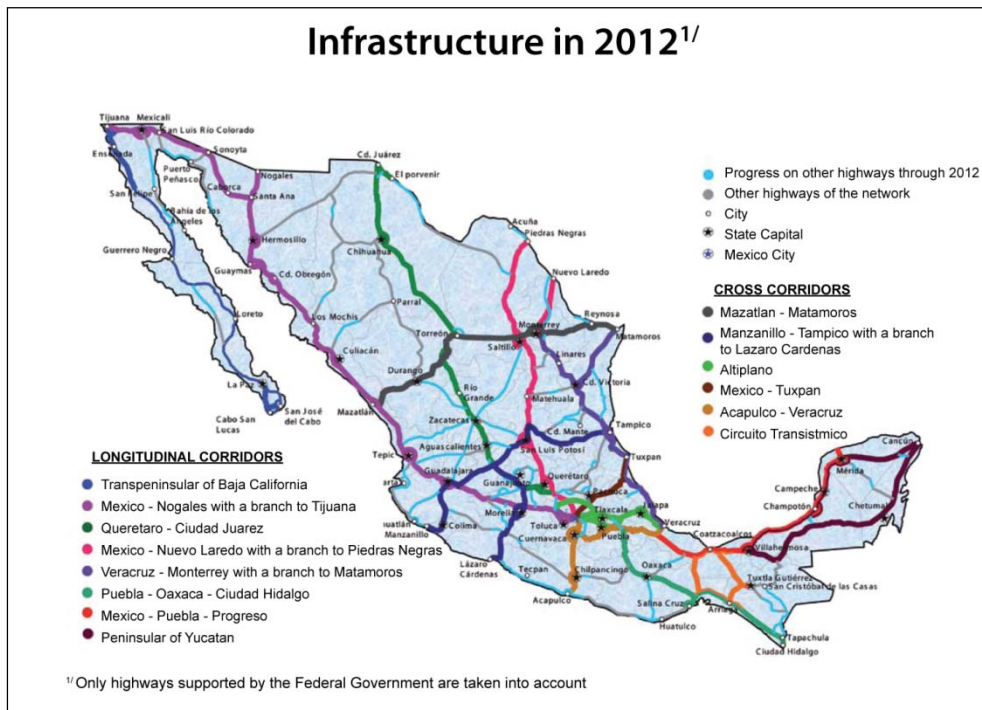
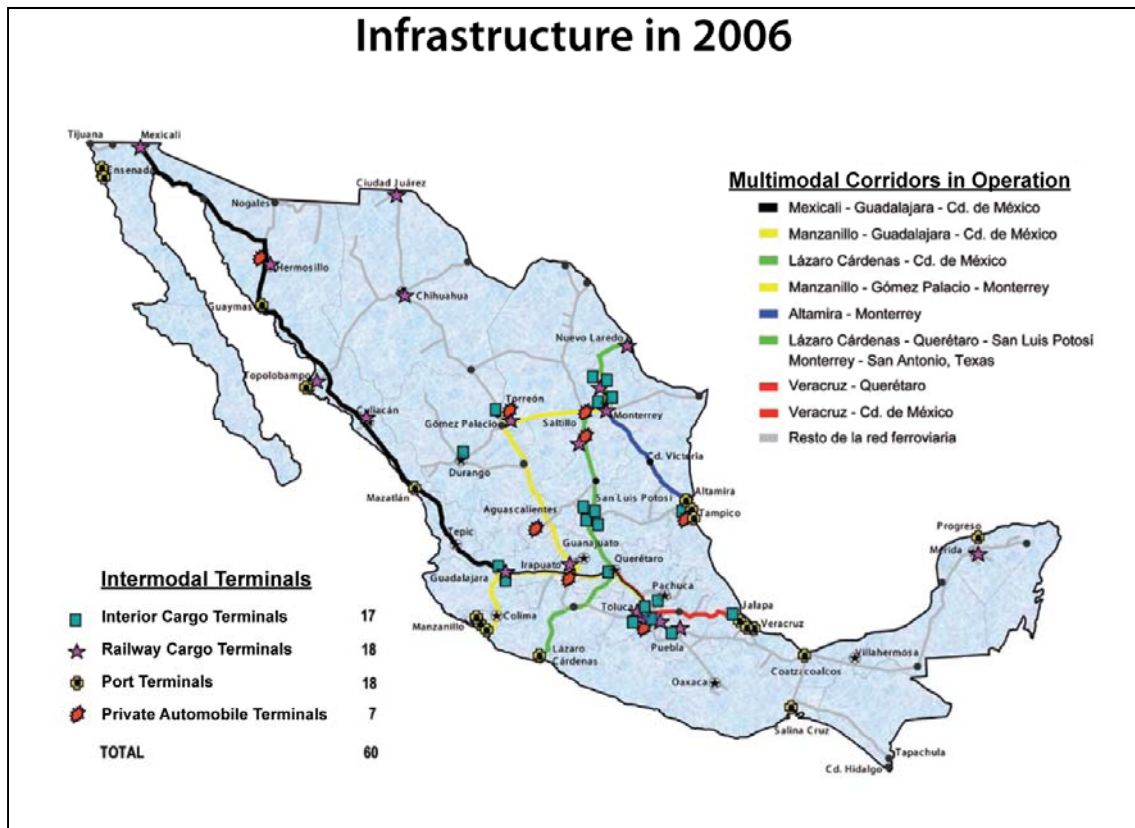


Figure B2: Proposed Mexican Highway Infrastructure Network in 2012

Rail and Multimodal

The strategies for the railway and multimodal projects are: expansion of the railway system promoting the substitution of the current radial structure for a network one; develop multimodal corridors to increase efficiency, giving special attention to those that join the Pacific Ocean ports with those in the Gulf of Mexico and the border and cross through the industrial centers of Guadalajara, Aguascalientes, and San Luis Potosí; solve railway interconnection problems at ports, borders and metropolitan areas— like the Matamoros/Brownsville Rail Relocation; and promote development of suburban passenger trains and harmonize integration of railway in urban areas, for example the commuter rail in Mexico City. Figure B3 shows the multimodal network as at 2006.



Source: National Infrastructure Program 2007–2012

Figure B3: Mexico's Rail and Multimodal Infrastructure Network in 2006

Among the projects listed by the NIP are ten new multimodal corridors, including the construction of twelve intermodal cargo terminals and the start of Punta Colonet Port/Multimodal project. Figure B4 shows the proposed multimodal network for 2012. Note that it shows interior cargo networks at San Luis Potosí and Monterrey where two of the case study inland ports are being developed.

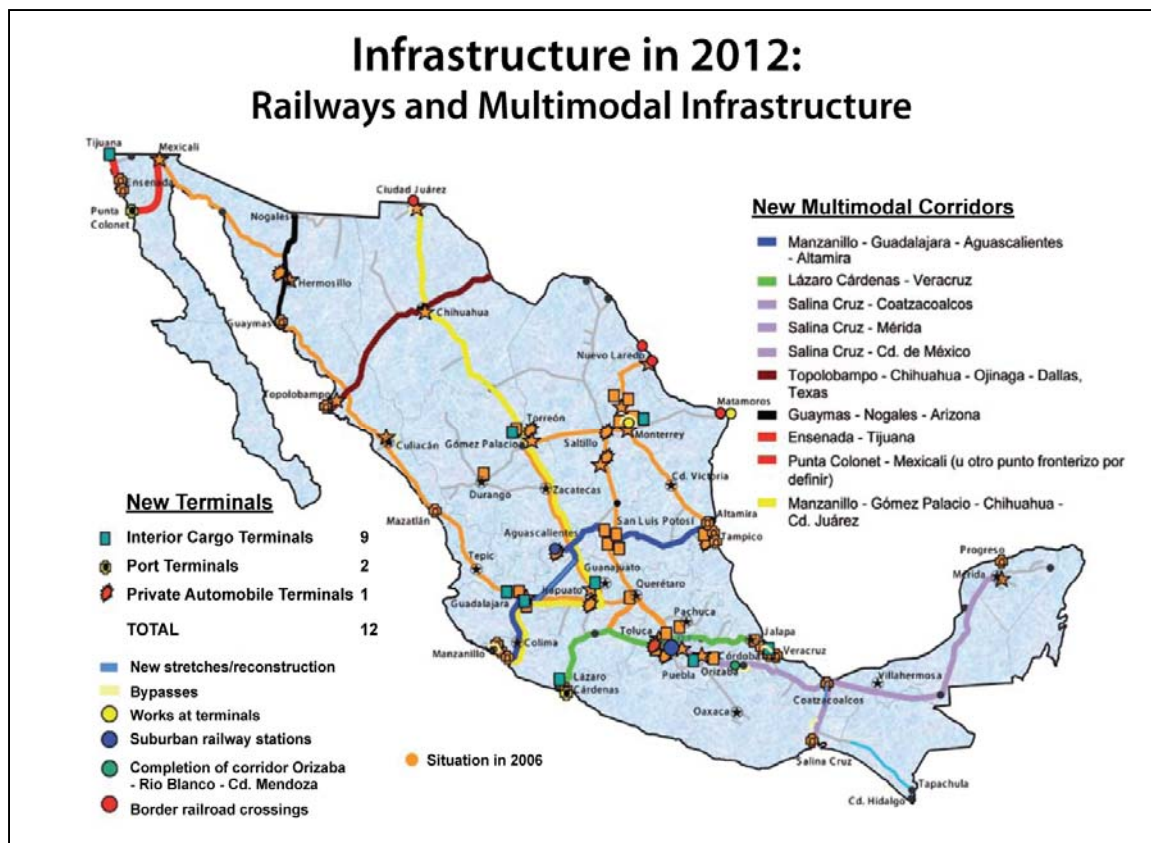


Figure B4: Proposed Mexican Railway and Multimodal Infrastructure Network in 2012

Ports and Airports

In the past 6 years the port infrastructure capacity barely grew while the volume of containers increased significantly. This has generated bottlenecks that make the extra investment necessary. The NIP looks at increasing port infrastructure both for cargo and tourism. NIP includes five new ports terminals and expansion of twenty-two other ones. Figure B5 shows the port network as at 2006 along with information on port characteristics and the amount of cargo movement. Figure B6 shows the proposed port network in 2012. Again the proposed port at Punta Colonet, along with new ports at Manzanillo, and expansion at Altamira, Lázaro Cárdenas, and Toplobampo are listed as projects in the NIP.

Infrastructure in 2006: (Cargo transported in millions of tons)

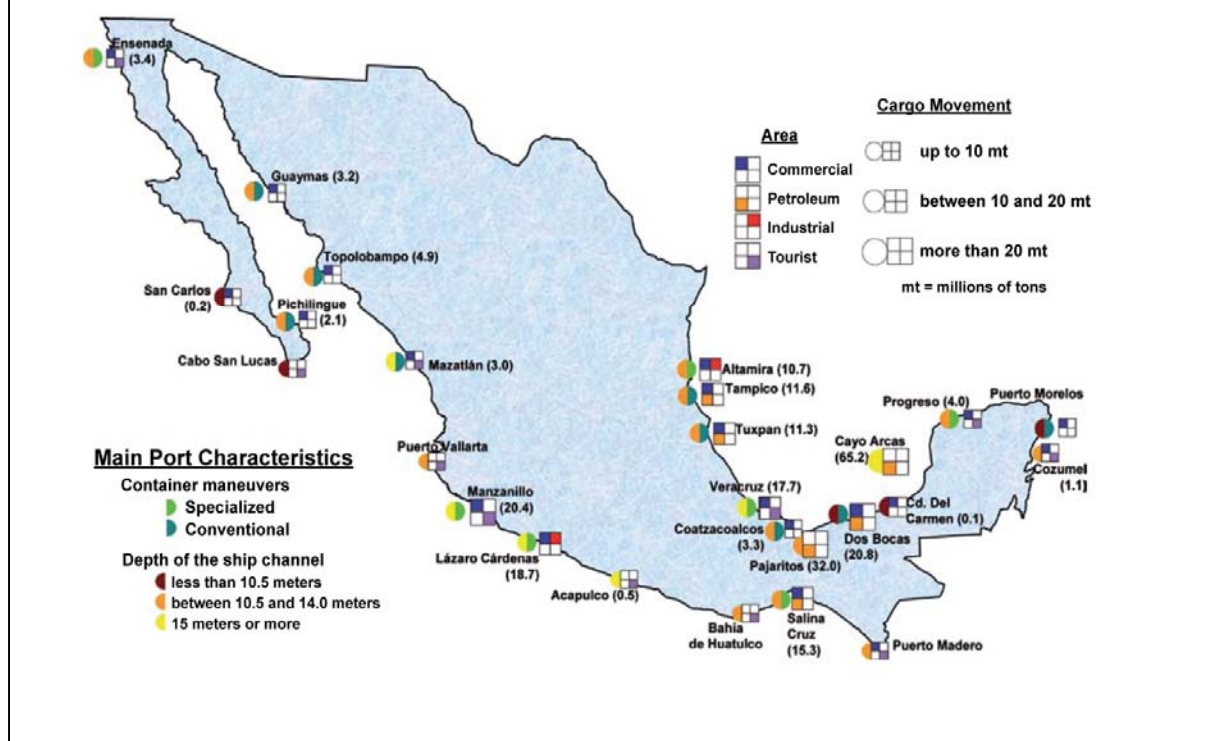
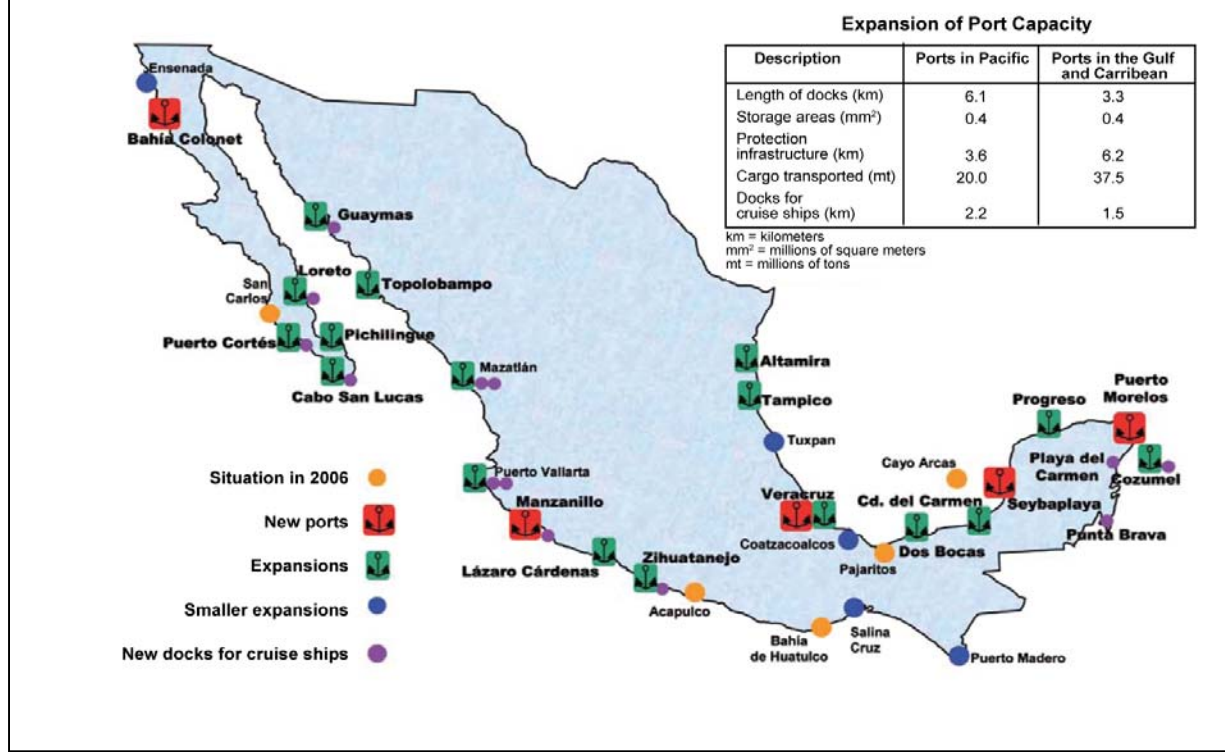


Figure B5: Mexican Ports, Cargo and Infrastructure in 2006

Infrastructure in 2012



Source: National Infrastructure Program 2007–2012

Figure B6: Proposed Mexican Port Infrastructure Network in 2012

The NIP also considers the construction of three new airports, although their emphasis is basically to increase tourism activity, especially those in Riviera Maya south of Cancun and Puerto Peñasco in Sonora close to the Arizona border. Figure B7 shows the proposed Airport infrastructure in 2012. Note that this shows the expansion of Monterrey International Airport which was one of the case studies discussed in Chapter Four of this report.

Infrastructure in 2012 Airports

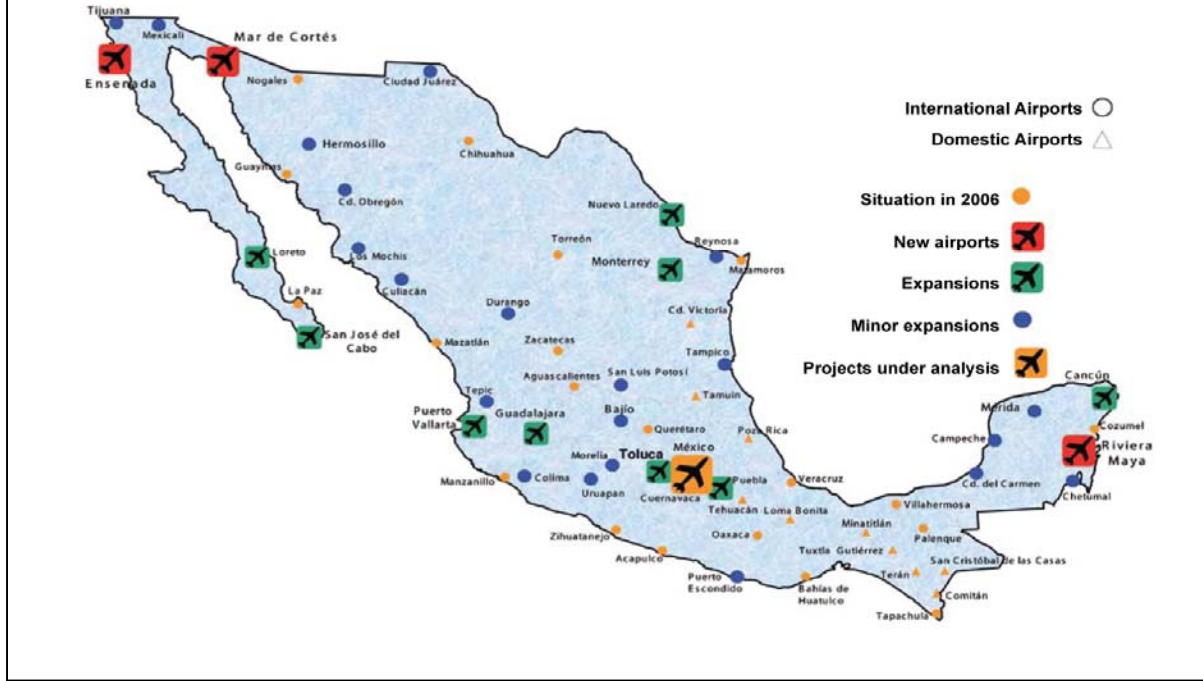


Figure B7: Proposed Mexican Airport Infrastructure Network in 2012

APPENDIX C: Right-of-Way Flowcharts

SCT's Row division kindly gave CTR flowcharts of the ROW acquisition process. These can be seen in Figures C1 through C4. Note that C4 shows the process for ROW acquisition for a PPP project.

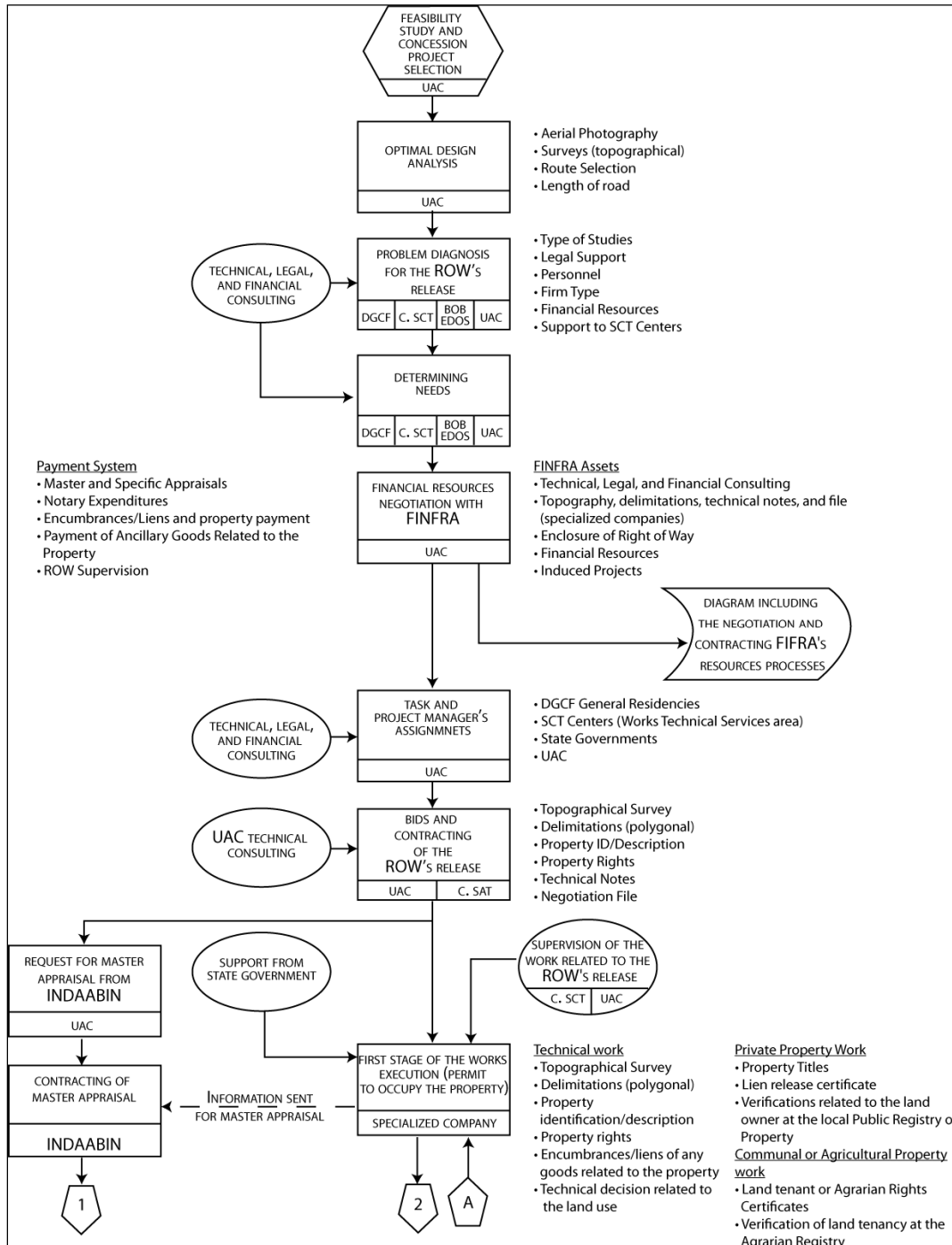


Figure C1: Mexico's Right-of-way Acquisition Process (Flow Chart I)

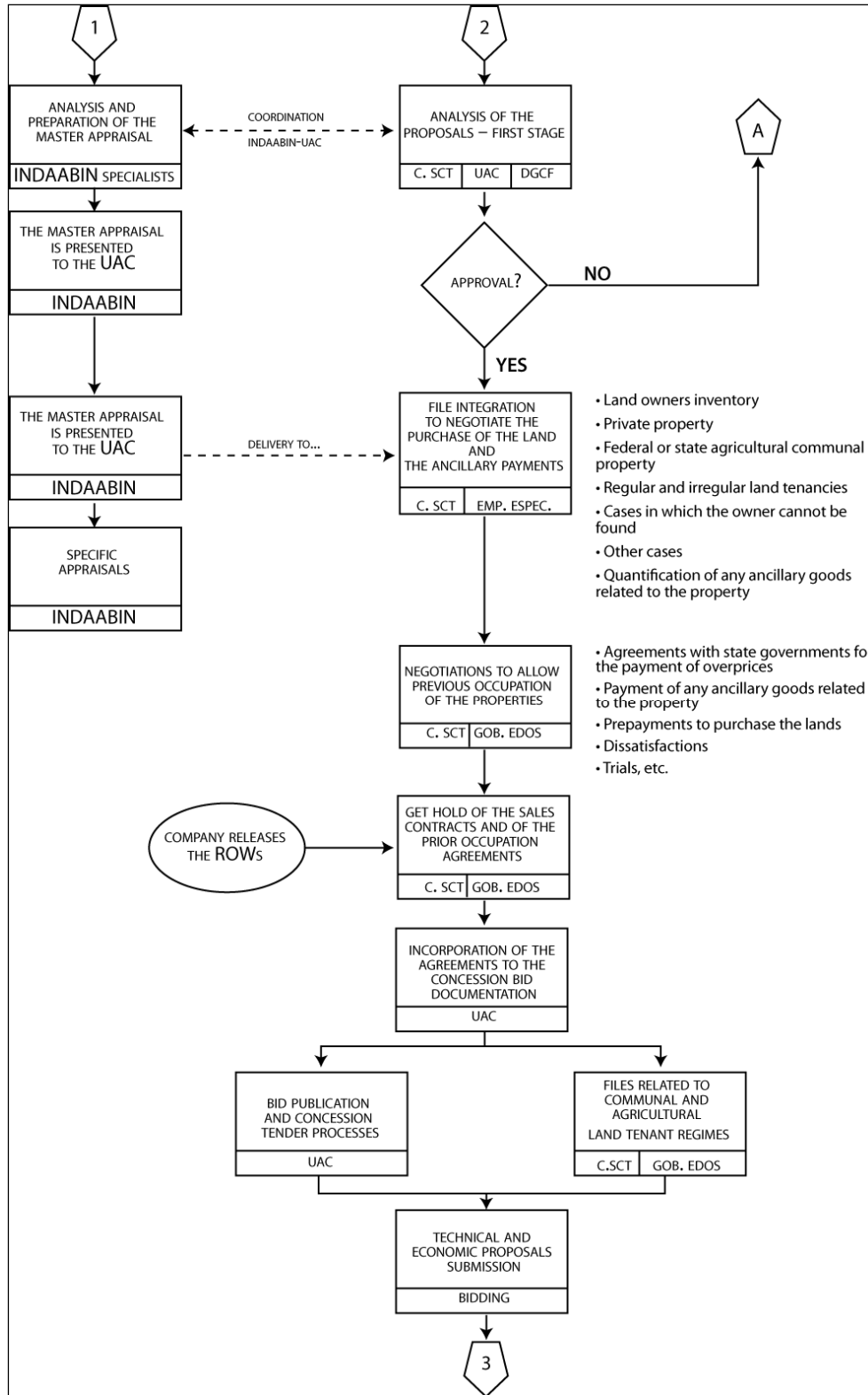


Figure C2: Mexico's Right-of-way Acquisition Process (Flow Chart II)

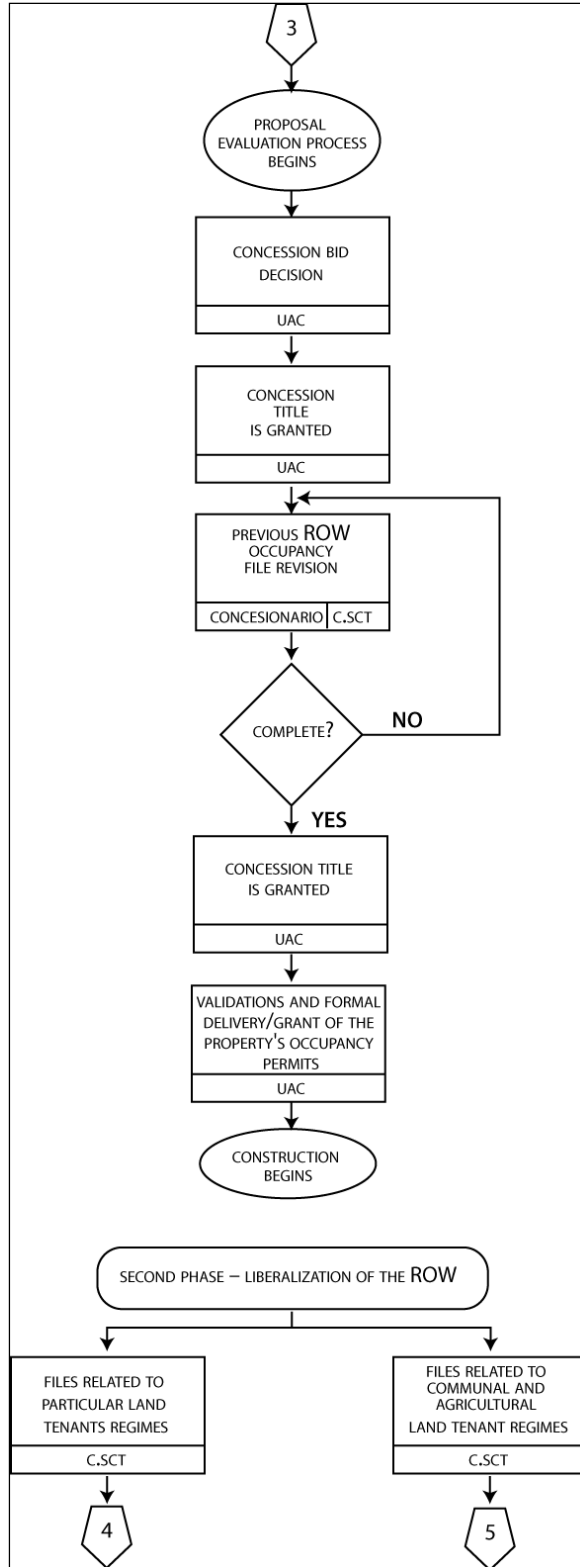


Figure C3: Mexico's Right-of-way Acquisition Process (Flow Chart III)

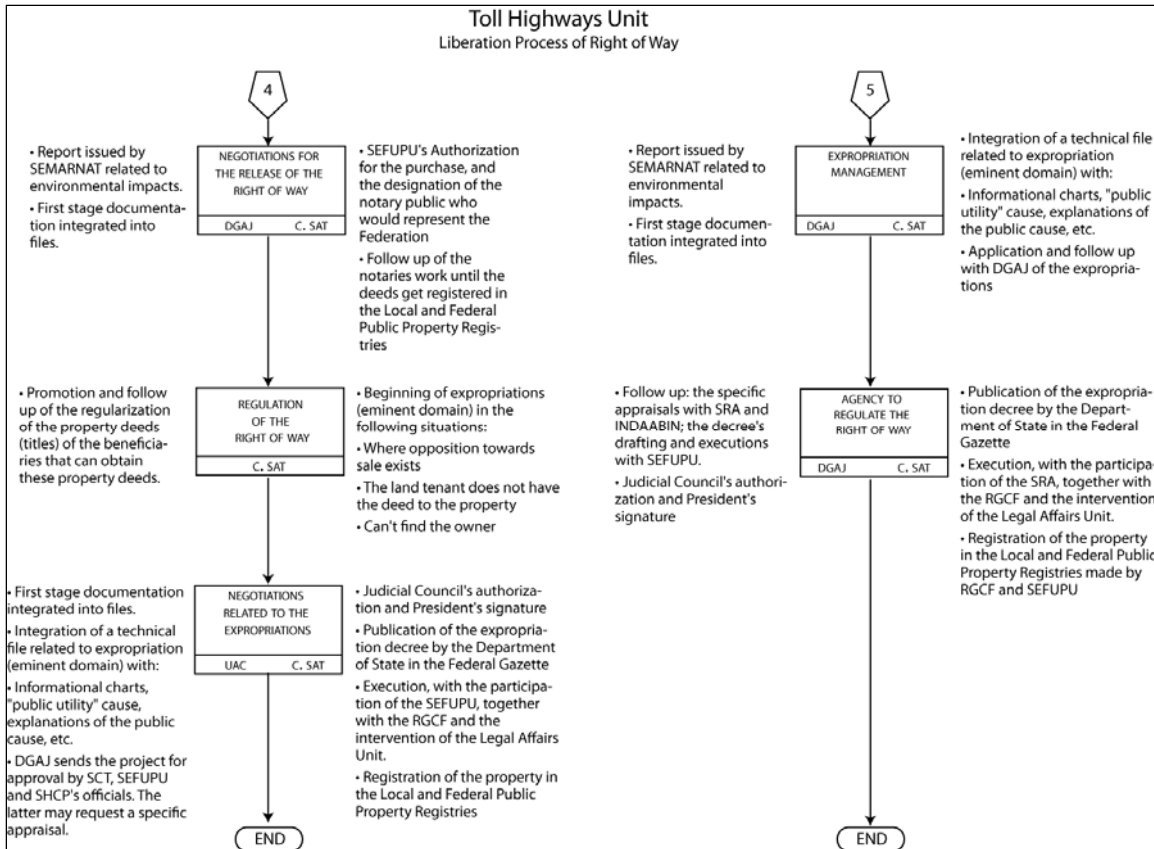


Figure C4: Mexico's Right-of-way Acquisition Process for Toll Units