

Chapter 11: INFRASTRUCTURE FOR HUMAN WELFARE AND ECONOMIC GROWTH¹

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Mexico's infrastructure and housing sectors have shown improvements in a number of areas over the last six years, and there are segments where Mexico outperforms regional comparators. The number of new annual new housing units constructed has increased by over 40 percent, and road density, paved roads per worker and access to electricity services are all high by regional standards. There remain challenges, however, in terms of improving the quality of infrastructure and in closing gaps in access, especially in rural and indigenous communities. A reform program that focuses on seven areas is discussed in this note: (i) refocus public spending on areas that the private sector cannot finance; (ii) use incremental resources released to focus on maintenance and rehabilitation, strategic infrastructure bottlenecks and extension of basic services and housing for the poor; (iii) improve the design of investment programs through the budget process; (iv) increase private financing for infrastructure to leverage public resources; (v) revise the design of public sector credit enhancements for public-private partnerships; (vi) strengthen arms-length regulation of tariffs and service quality; and (vii) improve accountability and information on performance outcomes.

INTRODUCTION

1. **Mexico's infrastructure and housing sectors are in transition as the country recognizes that better provision of these services is necessary to reduce poverty and inequality, accelerate economic growth, improve international competitiveness, and advance territorial integration.** The process involves allocating investments more efficiently as well as generating additional resources through more effective institutional frameworks, enhanced service delivery, and adequate pricing policies. And it involves a break with the past, when rents accruing to the public sector for housing and infrastructure were often distributed primarily to assure political support for the governing party.

2. **Mexico has been spending a substantial amount of fiscal resources on infrastructure and housing, but the amount is not high by world standards.** In 2003, the Government of Mexico spent about 1.2 percent of gross domestic product (GDP) on infrastructure investment and maintenance (electricity, transport, water supply, and sanitation), and provided 0.7 percent of GDP on untargeted consumption subsidies for the electricity sector. In the same year, the Government also spent 0.11 percent of GDP in housing subsidies through the federal budget (an amount dwarfed by the off-budget implicit subsidies of the national housing funds).²

¹ The discussion of the electricity and transport sectors in this note draws largely from the *Mexico Infrastructure Public Expenditure Review*, World Bank (2005).

² Off-budget implicit subsidies from INFONAVIT and FOVISSSTE represent around 96% of total subsidies for housing. A recent study estimates that US\$ 239 million were allocated through implicit subsidies from INFONAVIT in 2005 for its

3. **The overall impact of this spending on the quality and coverage of services has been mixed.** Mexico has a reasonable level of infrastructure coverage relative to other countries in Latin America (as it should, given its comparable wealth) and some sectors - including rail and ports - perform reasonably well by international standards. Overall, however, the quality and reliability of infrastructure services are generally below what could be expected of an upper-middle-income country, and costs are sometimes high. This reduces the standard of living of Mexican citizens and impedes international competitiveness. Many poor Mexicans still lack access to basic services and adequate housing. Currently, only about 25 percent of the households earning less than four minimum salaries (70 percent of the total population) can access formal finished housing markets. The country spends almost double what the United States does on transport as a percentage of GDP, and prices of fuel and electricity in Mexico are among the highest in the world.

4. **Looking forward, present spending levels may be sufficient for Mexico to achieve universal coverage for safe water, sanitation and electricity, to modernize and complete its major transport corridors, and to improve the overall quality and reliability of service. But this will require substantially improved expenditure efficiency, a much more strategic use of the private sector, and better targeting of subsidies.** Maintaining current government spending levels on infrastructure at between 1 percent and 1.25 percent of GDP, Mexico would remain around the Latin America average in both infrastructure coverage and expenditures, but it would not reach the level of infrastructure per capita of the other OECD countries or faster-growing East Asian countries (such as Korea, which just a few decades ago trailed far behind Mexico in terms of infrastructure endowments).³ In terms of housing, more effective use of on-budget and off-budget subsidies could have a significant impact on the quality of and access to housing for lower income households. For Mexico to close the housing gap in the near term, increased fiscal resources will be needed.

5. **In many ways, Mexico is between two worlds and there are two worlds within Mexico.** Some infrastructure projects perform at the highest OECD standards, while infrastructure quality on average lags far behind these standards. Within Mexico, some states have high quality road networks and near universal access to basic services, while some rural municipalities have indicators that more resemble the poorer countries of Latin America. This note provides an overview of coverage, quality and efficiency of infrastructure and housing, reviews sectoral performance and presents a set of recommendations for reform. The note focuses on the transport, electricity and housing sectors, key areas for investment, both to address gaps in access for particular populations and for the impact of these sectors on growth and competitiveness. Water and sanitation services are also critical in this regard, but are addressed in a separate policy note on the broader water sector.

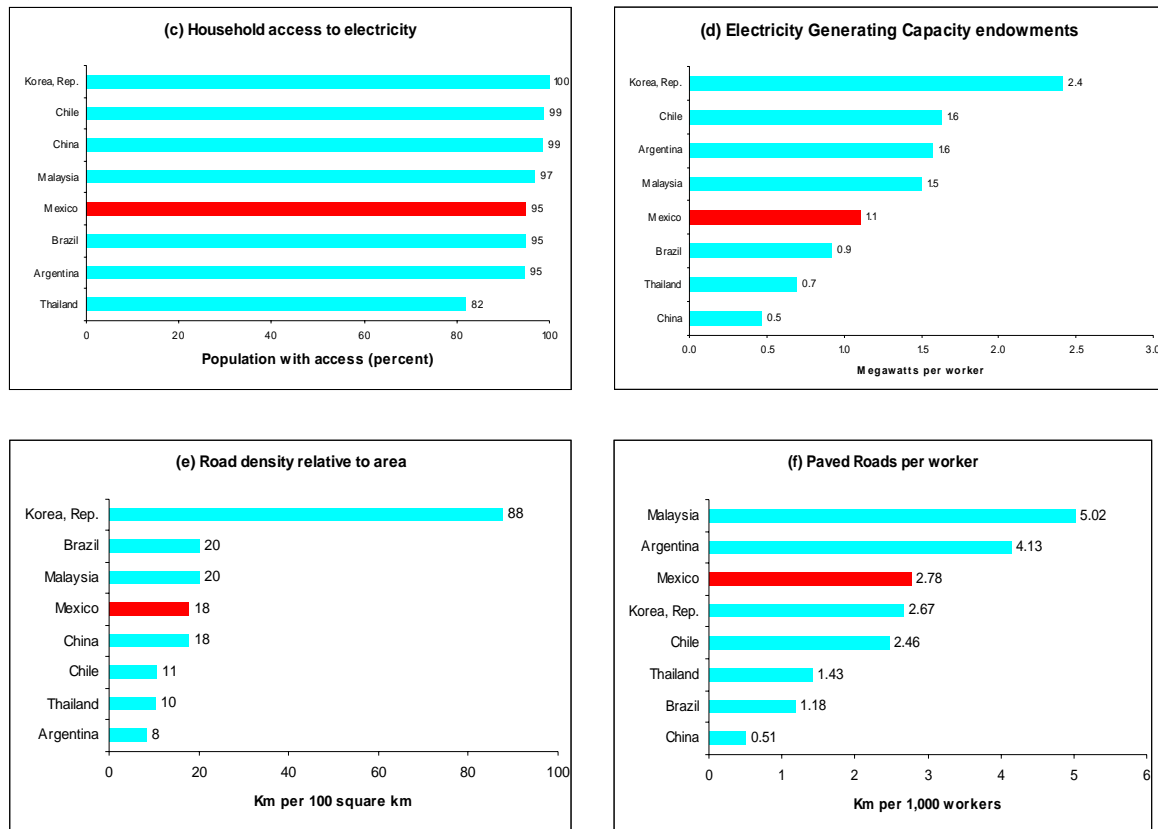
new loans that year, using INFONAVIT's break even rate of return as the comparator benchmark. Additional studies using market rates as reference, estimate implicit subsidies from INFONAVIT and FOVISSSTE in 2005 at as much as US\$ 2.5 billion on their total net outstanding debt.

³ In 1960 Korea had less than half Mexico's paved road density; today it has 11 times more. In 1969, Korea had one-third the power infrastructure per capita of Mexico; today it has about three times as much.

INFRASTRUCTURE SERVICES TODAY: COVERAGE, QUALITY, AND EFFICIENCY

6. **Mexico has made steady progress in increasing the coverage of electricity and roads over recent decades, reaching levels among the highest in Latin America (see Figure 1).** Household access to electricity services, at 95 percent is among the highest in the region. Road density and paved roads per worker surpass regional infrastructure leaders such as Chile.

Figure 1: Electricity and road coverage in Mexico among highest in the region



Source: World Development Indicators database, most recent available years

7. **There has also been a dramatic increase in new house construction during recent years.** Between 2002 and 2005, annual creation of new formal sector houses increased by over 42 percent, growing from about 480,000 units per year in 2000 to 680,000 units in 2005. The Fox government is likely to hit its target of 750,000 new units per year, approximately the rate of annual new household creation.⁴

8. **For productive infrastructure, the greatest challenges are to improve service quality and operating efficiency, rather than coverage.** Large industrial users ranked the average quality of Mexico's infrastructure strong for Latin American but lagging some of the major East Asian economies in the World Economic Forum survey (2006). The gap was widest for the quality of electricity supply and the narrowest for ports and railroads (Table 1).

⁴ Source: Comisión Nacional de Vivienda, www.conafovi.gob.mx.

**Table 1: Comparative Survey on the Quality of Infrastructure, 2006,
Selected Countries**

Country	Overall Infrastructure Quality*	Port Infrastructure Quality	Railroad Infrastructure Quality	Electricity Supply Quality
Argentina	3.35	3.41	2.28	4.00
Brazil	2.85	2.68	1.83	4.99
Chile	5.11	4.88	2.66	5.62
China	3.44	3.69	3.79	3.90
Colombia	2.80	2.90	1.36	4.72
Indonesia	2.53	2.44	2.43	3.47
Malaysia	5.68	5.75	5.04	5.79
Mexico	3.63	3.40	2.37	4.06
Philippines	2.67	2.70	1.68	4.02
Thailand	5.04	4.67	3.59	5.48
United States	6.08	5.69	5.11	6.26
Sample average	3.78	3.68	2.90	4.48

*“Overall infrastructure” includes quality indicators from other sectors not shown above (that is, air transport and information and communication technologies).

Note: Survey-based subjective evaluation on a scale from 1 – “underdeveloped and inefficient” to 7 – “as developed and efficient as the world’s best.”

Source: WEF (2006).

9. **However, gaps in infrastructure coverage and quality do persist in poor, rural, and indigenous communities.** While these gaps are not large in international terms, addressing them is important in Mexico’s drive to reduce poverty and promote equality and integration. Table 2 below shows that while coverage is high in urban areas, the situation in rural Mexico is very different. While 94 percent of the population in urban Mexico has access to improved water sources, only 76 percent do in rural areas, and among the extreme poor this drops to only 42 percent. Coverage is particularly low for indigenous communities, in which 17 percent of the population lack electricity and 35 percent lack access to an improved water source (World Bank, 2006b). Overall, people living in poor municipalities, regardless of their urban or rural characteristics, are less likely to have access. Table 3 shows that 14 percent of the population in the country’s poorest municipalities lack access to electricity, compared with less than 0.6 percent in the country’s wealthiest. For housing, the poor have not benefited proportionately from the recent expansion in new housing. The expanded provision of finished units has largely served the middle and upper income brackets. These finished mortgage financed units are not accessible for families earning less than 4 minimum salaries (70 percent of the total population).

Table 2: Household Indicators - Electricity, Water, Floor and Sanitation (1992-2004)

		National			Urban			Rural		
		1992	2002	2004	1992	2002	2004	1992	2002	2004
Electricity	Connected	92.4	98.0	98.7	98.5	99.5	99.5	76.2	93.5	95.8
	Not connected	7.6	2.0	1.3	1.5	0.5	0.5	23.8	6.5	4.2
Water	Improved water source	80.7	89.9	90.1	92.2	96.2	94.4	50.3	70.6	75.6
	Non-improved water source	19.3	10.1	9.9	7.8	3.8	5.6	49.7	29.4	24.4

Source: WB staff estimation using ENIGH surveys (several years).

Table 3: Access to Basic Services by Group of Municipalities (2000)

	I (poorest)	II	III	IV (richest)	Whole Sample
% of population without electricity	13.99	3.21	1.32	0.63	4.79
% of population without improved water	28.86	10.03	4.04	2.07	11.23
% of population without sanitation	26.72	9.33	2.49	1.06	9.89
% of population living in loc. with less than 5,000 inhab.	77.02	36.28	7.95	2.75	30.97
Total Population	24.3M	24.3M	24.0M	24.7M	97.4M
# Municipalities	1,553	669	132	56	2,410

Note: Authors' elaboration based on Conapo information at municipal level. Percentages were weighted by population in the municipality.

Electricity

10. **The service quality of Mexico's main electricity provider, the *Comisión Federal de Electricidad* (National Electric Company, CFE), has improved but still lags behind international standards and client expectations.** For annual interruptions and distribution losses CFE's performance is poor and rated by business as lagging compared to the major Latin American economies (see Table 4 and Figure 2), and the service quality and operating efficiency of the other electricity provider, *Luz y Fuerza del Centro* (LFC), are even worse.

Table 4: Quality of Electrical Service, 1995-2003

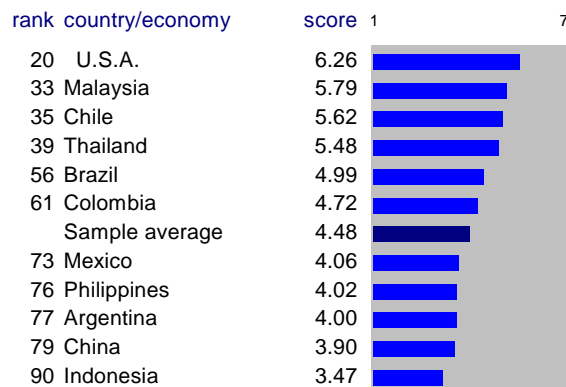
		1995	1998	2002	2003	2004	2005
Interruption of Service (min/customer)	CFE	242	225	124	120	89	
	LFC	—	374	144	135	119	113
Complaints (no./1,000 customers month)	CFE	14	10.7	4.2	4.1	3.8	3.9
	LFC	—	6.7	4.4	4.3	6.6	9.3
Connection time, new customers (days)	CFE	2.3	1.4	1.2	1.1	1.1	1.1
	LFC	—	10	5.5	6.0	6.1	6.3

Note: — = Not available.

Sources: Data provided by CFE's Subdirección de Control Financiero, and LFC's Subdirección de Finanzas.

Figure 2: Quality of Electricity Supply

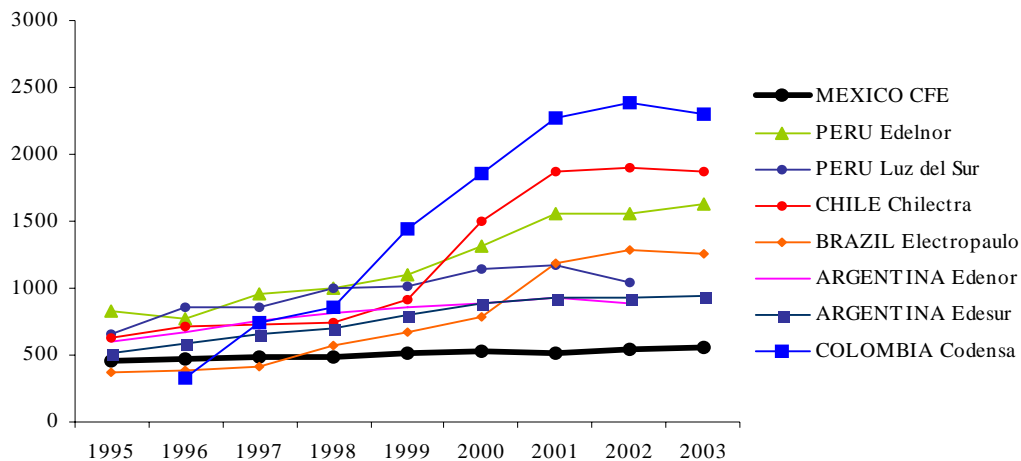
2.05 Quality of electricity supply



Source: WEF 2006

11. **Labor efficiency indicators for electricity in Mexico have also slightly improved, but remain below international benchmarks.** The total number of permanent employees (including *de confianza* [managerial and thus nonunionized] and *sindicalizados* [unionized]) has remained almost constant, while electricity demand and production have grown. When compared to selected Latin American privatized distribution companies, however, CFE has still performed poorly (Figure 3).

Figure 3: Number of Electricity Connections per Worker in Distribution Segment



Sources: CFE financial data; and Andres, Foster, and Guasch (2006).

12. **Access to electricity in Mexico has steadily increased over recent decades,** reaching levels significantly above the average for the region and other developing countries, with 95 percent of the population connected to the electricity grid (Table 5). This coverage expansion has favored the extreme poor and rural dwellers. For example, 90 percent of the extreme poor had access to electricity in 2002, up from only 63 percent in 1992 (World Bank, 2004a).

Table 5: Mexico's electricity coverage is comparatively high

National Coverage (%)	Mexico	Argentina	Brazil	Chile	Colombia	LAC Avg.	Philippines	Thailand	Indonesia
Electricity	95	95	95	99	93	88	80	82	53

Sources: World Bank (2004) East Asia report; data for Mexico in electricity coverage from INEGI (2002).

13. **Nevertheless, rural areas and indigenous communities remain underserved.** For example, electricity coverage in the predominantly rural Southern States (Chiapas, Guerrero, Oaxaca, Veracruz) reaches only half to two-thirds of settlements.⁵ Unelectrified localities are mainly small indigenous communities, generally living in extreme poverty, with populations below 1,000 inhabitants, located in remote rural areas.⁶ Addressing the low electricity coverage rate, especially in poor communities, is hampered by the current lack of appropriate mechanisms for extending access, such as a formal operational rural electrification program, which would consider off-grid solutions, rural economic development and sustainability issues.⁷

Transport

14. **In the transport sector, the need to improve quality is most evident for roads.** Under pressure from growing traffic volumes, Mexico's aging road network, particularly where run by states and municipalities, is in poor condition and badly in need of repair. Expenditure on maintenance falls far short of needs, often necessitating costly rehabilitation works. Urban areas face additional transport challenges as efforts to increase the coverage of urban roads and transport services are outpaced by motorization. In contrast, structural reforms in Mexico's railways and ports have permitted increased investment and improvements in the quality of service.

15. **As a result of insufficient spending on maintenance and modernization, the condition of many road assets is not satisfactory.** Many federal, state, and local roads are old and require either renovation or replacement, particularly with steadily increasing traffic. Road use has risen significantly over the last decade, with road transport by bus and truck currently accounting for 99 percent of domestic commercial passenger traffic and more than 78 percent of surface freight cargo. Following trucking deregulation in 1989, and the advent of the North American Free Trade Agreement (NAFTA), trucking activity has grown by 32.5 percent, and the authorized weight of vehicles was raised from 34 tons in 1960 to 66.5 tons in 1997.⁸ The number of personal vehicles (mostly cars) is growing at 7.6 percent per year, adding to the road infrastructure demand (World Bank, 2005).

⁵ There are still 2,600 localities of between 100 and 10,000 inhabitants without electricity in this region.

⁶ Initiatives led by the Indigenous People Development Commission focus exclusively on costly grid-extensions which favor communities with more than 1,000 inhabitants.

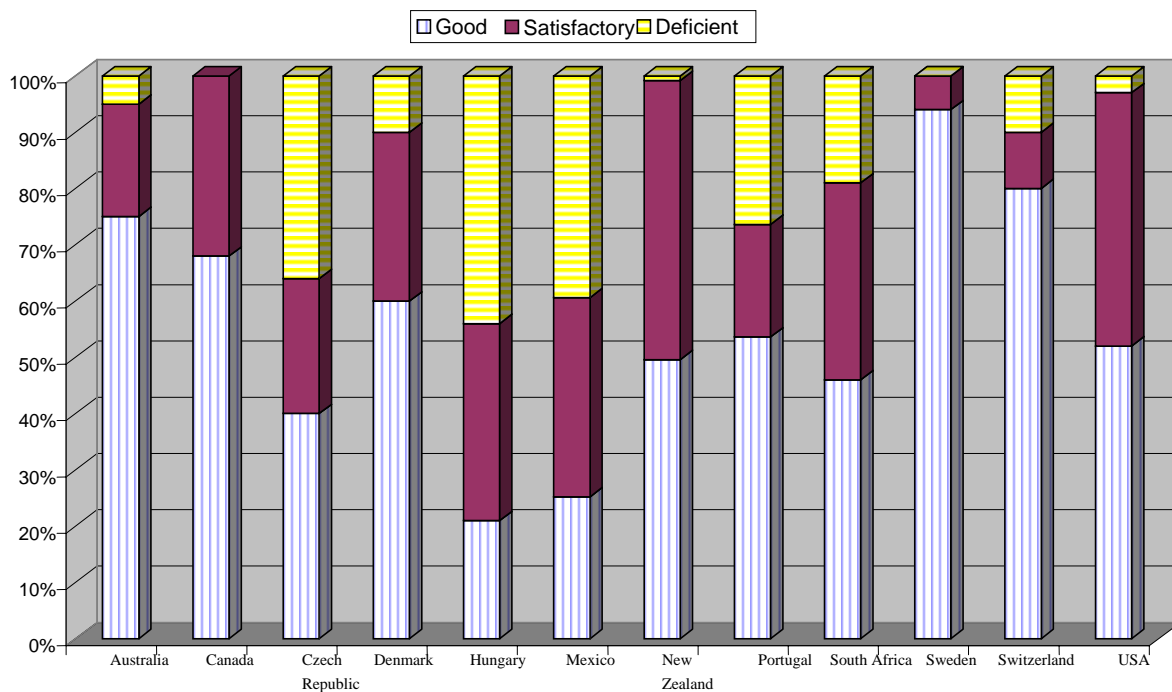
⁷ Sener is currently working with three southern states, as well as with World Bank and GEF support, to develop a pilot program along these lines.

⁸ The trucking industry has a relatively aged fleet (17.5 years on average). In addition, the large number of owner-operators leads to inefficiencies and limits economies of scale, while at the same time providing only modest service quality and efficiency.

16. Considering 20 indicators of road quality—including operational standards, traffic, design features, security, and maintenance—only 61 percent of the highway system can be considered modern, with 39 percent requiring improvements.⁹ Only one-quarter of roads are in good condition, well below the almost 60 percent average for other OECD countries¹⁰ (see Figure 4). Overall, the maintenance and improvement of main federal corridors, although showing a positive trend, still lag behind demand. State and municipally controlled roads are in particularly bad condition, especially in rural areas.¹¹

17. Urban transport faces additional challenges due largely to Mexico’s high level of urbanization (around 70 percent) and the pressing demand for increased mobility associated with rising income levels. Motor vehicle ownership and use are growing faster than population, and are expected to continue to grow at 10 to 15 percent per year in the near term in key cities. The average distance traveled per vehicle is also increasing in all but the largest, most-congested cities. This growth exceeds the ability of cities to increase road space, resulting in congestion and a slowing of urban economies. Urban travel costs are high – representing 20 percent of daily expenses for low income people. Severe congestion, along with inadequate road design and poor traffic management contribute to the prevalence of road accidents, which are the fifth largest cause of death in Mexico.

Figure 4: Quality of the Road Network, 2000



Source: World Bank (2005) *Infrastructure Public Expenditure Review*.

⁹ Communications and Transport Sector Program 2001–2006.

¹⁰ See Guerrero (2004). The source of data is the World Road Association (PIARC).

¹¹ There is very little data on the quality of roads at the subnational level, which might be symptomatic of larger issues of quality in the sector at that level.

18. **Weak institutional capacity exacerbates the situation.** Some cities have shown improvement in recent years, such as Leon and Ciudad Juarez where emphasis was placed on developing strong planning institutions and a cadre of experienced staff. Yet for the majority of cities, this capacity is lacking, specifically in terms of transport supply management (streets, etc.) and demand management (bus route licensing), where currently the latter is primarily the responsibility of the state government. Public transport services provided by the various operational entities are neither physically, operationally, nor financially integrated, resulting in reduced system efficiency.

19. **Structural reforms, including privatization, have enhanced the quality and efficiency of service of Mexico's railroads and ports, which now perform reasonably well by international standards, but fall short of best practice.** The rail industry shows a diminishing number of accidents per kilometer, better use of assets (as shown by the higher number of tons per locomotive), improved service quality (as indicated by the lower number of losses and claims), and a more efficient use of fuel (Guerrero 2004). However, efficiency still falls short of levels achieved in the United States and other OECD countries. The port industry has posted significant increases in containers per ship transferred per hour, reducing the time ships need to stay in port. One problem for ports is the delays still experienced in moving cargo from terminal to rail or truck transportation. This is due not only to a shortage of physical infrastructure in port terminals, but also to weak trade facilitation procedures and to sub-optimal management of logistics chains by users and agents.¹²

Housing

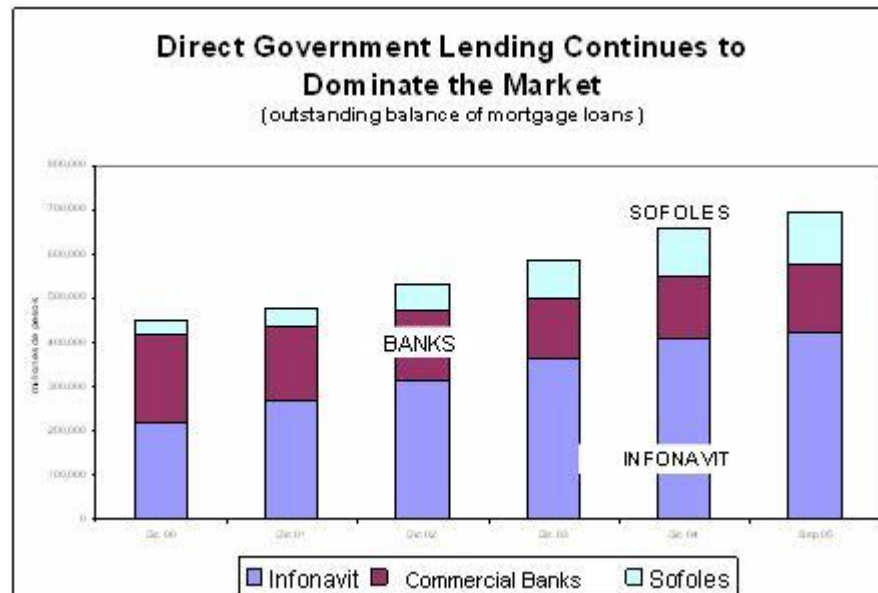
20. **The housing sector has seen major improvements over the last six years, providing efficient and increasingly competitive new housing to the middle and upper income segments.** The Fox administration will likely meet its goal of 750,000 units annually by 2006. However, the poor still face significant housing challenges, as much of the population lives in informal or precarious housing: of the estimated 22.2 million households in Mexico in 2000, 35 percent lived in overcrowded or substandard housing. Thirteen percent of houses lacked indoor plumbing, and 10 percent had roofs made of low quality materials. Rather than purchasing finished units and using debt financing to pay for the house, low-income households rely predominately on gradual and often informal self-construction paid for in cash from income and savings.

21. **Public and private lenders and subsidy providers together financed 678,343 housing units in 2005.** The 2005 results represent an impressive 42 percent growth over the number of loans and subsidies delivered in 2000. Though private sector housing finance is growing, the public institutions continue to fund the majority of housing. The system-wide mortgage portfolio grew 55 percent in pesos between 2000 and 2005, to reach 8.8 percent of GDP. This still remains small compared to other comparator countries (for example, 15 percent in Chile, 65 percent in the US and 45 percent in Portugal). The amount of outstanding loans from private specialized lenders, SOFOLs, grew as did Bank

¹² For details, see *Diagnóstico General sobre la Plataforma Logística del Transporte de Carga en México*, Instituto Mexicano del Transporte, (2003, SCT).

lending, though starting from a very small amount. Benefiting from operational reforms and legal advantages, INFONAVIT (a state owned provident housing fund) increased its dominance of the primary mortgage market, growing from 48.8 percent of outstanding balances in 2000 to 59.9 percent at the end of 2005 (see Figure 5).¹³

Figure 5:



Source: CONAVI

22. **Though improving, the formal housing finance system still does not meet the needs of poor households.** The vast majority of public and private sector financing targets those earning 7 minimum wages or more, representing the top quarter of the income distribution.¹⁴ Families earning three minimum wages or less have the most acute housing needs, most of which do not qualify for a mortgage loan. Of low income households, 80 percent work in the informal sector, leaving only 20 percent with access to the employment-linked, state-owned providential housing funds INFONAVIT and FOVISSSTE, the largest sources of mortgage finance. In 2005 INFONAVIT prioritized lending to households earning less than 4 minimum wages, which represent around 65 percent of their affiliates.¹⁵ Beyond the two housing funds, SOFOLs target both formal and informal households earning more than 7 monthly minimum wages (and as low as 5 minimum wages with the use of up-front subsidies), and commercial banks lend to formal sector employed households earning above 10 minimum wages.

¹³ Data on FOVISSSTE balances prior to 2005 are not available.

¹⁴ In Mexico, 27 percent of households earn 7 minimum wages or more. Source: INEGI.

¹⁵ Approximately 44 percent of FOVISSSTE member households earn less than 4 minimum wages. Though progress has been made, INFONAVIT products remain out of reach of many of its low-income affiliates. In 2005, in moving down market, INFONAVIT satisfied 3.4 percent of the demand of low income households, providing 145,133 mortgages with subsidized interest rates to individuals earning less than 4 monthly minimum wages. Source: INEGI, INFONAVIT, FOVISSSTE, with analysis by McKinsey & Co.

23. **Government housing programs have focused almost exclusively on the production of new owner-occupied housing, leaving aside existing housing or rental housing.** While there are some programs for renovation, approximately 83 percent of credits finance the purchase of houses, most of which are single-family residences, as opposed to apartments. There are no programs to support the development of rental housing, which could be an important alternative for households with incomes too low to afford the maintenance of a unit that meets building standards. Residential rental markets are weak in Mexico and suffer from tax bias in favor of owner occupied units. Current financing programs, in combination with long-standing problems with access to developable land, have contributed to suburban sprawl, increasing demand for expanding trunk infrastructure and increasing congestion and commuting times. Government programs need to be made neutral with respect to financing new or existing home purchases, as well as home improvement. At the same time, the government should continue its recent efforts to expand renovation of self-built and substandard housing by supporting housing microfinance loans, lease to own programs, and higher risk mortgage lending through cheaper SHF (and private) mortgage insurance products.

24. **Availability of urban land is a major bottleneck in the housing sector.** It is estimated that 24 percent of all households (3.5 million households) live on illegally occupied land. Household surveys undertaken in 31 low income settlements shows that 43 percent of households do not have formal property titles.¹⁶ Self-help housing is a key alternative for the poor, but urban land for it is largely excluded from formal land markets. Government interventions in this area have largely failed through unrealistically high zoning requirements and a concomitant failure to enforce these regulations. Market interventions that result in removing land from the market further limit supply. Other problems include inadequate and poorly planned provision of trunk infrastructure, weak local government capacity for strategic land-use planning, and cumbersome documentation and procedures for titling and registry. In addition, the regulations surrounding *ejido* land (lands under communal ownership) continue to contribute to land informality - as *ejido* land is informally converted from rural communal use to urban use - but the previously mentioned factors play an increasingly important role. The size and spatial distribution of the various types of informality in Mexico are not fully known, which makes this a significant issue for research to support the design of titling programs, along with up-to-date and accurate data on land markets as a basis for policy and programs.

25. **The growth of urban slums in Mexico reflects the failures in land and housing markets and related government programs.** The improvement of urban areas in Mexico, in particular those inhabited by the poor, have been supported by the social ministry's, SEDESOL's, Habitat program and FAIS (a budgetary category of *Ramo* 33) fiscal transfers.¹⁷ Through grants to municipalities, the Habitat Program focuses on introducing improvements to urban infrastructure in slums, together with the delivery of social services and community development actions to improve quality of life and better integrate the neighborhoods with the surrounding city.¹⁸ The Habitat Program is the only large scale,

¹⁶ Source. Secretaria de Desarrollo Social.

¹⁷ *Ramo* 33 is a budget allocation that aggregates all the earmarked transfers to subnational governments.

¹⁸ The Habitat Program has eight types of interventions: (i) social and community development; (ii) opportunities for women; (iii) security for women and their communities; (iv) urban upgrading; (v) urban and environmental initiatives and

national urban upgrading program in Latin America¹⁹. Habitat's investments are better targeted to the poor than those of FAIS/*Ramo* 33, but the resources provided by FAIS/*Ramo* 33 are much larger.²⁰ While Habitat scaling up has been strong, more detailed evaluations would be important to strengthen the Program. Independent evaluations of Habitat have been general in nature and lack quantifiable information on results. Early evaluations point to the need for strengthening municipal capacity for planning and executing strategic investments directed to poor communities, to reduce political interference in the selection of investments, and to increase community participation in the design of projects. Based on the lessons learnt from other national slum upgrading programs (e.g. Thailand's Baan Mankong program or Indonesia's Kampung Improvement Program), there is a clear need to reorient and refocus Habitat into a comprehensive and long-term slum upgrading program.²¹

INVESTMENT: HOW MUCH IS SPENT AND NEEDED

26. **Public investment in Mexico has fluctuated substantially with the federal political cycles, with peaks in years of Presidential elections (1994, 2000) and Congressional elections (1997, 2003), although the cycle is less clear after 2001.** Over and above the political cycle, public investment has increased some since the collapse that followed the 1994–95 crisis.

27. **Infrastructure investment has not kept pace with the noted increase in overall public investment.** In fact, the infrastructure share of public investment declined from about 39 percent to 28 percent (Table 6).²² (PEMEX investments were increasing strongly.) Nevertheless, the absolute amount of resources invested in water and sanitation, transport and electricity increased from MxP64 billion (2003 pesos) in 1998 to MxP83 billion in 2003, or from 1.1 percent of GDP to 1.2 percent. The modest increase in public infrastructure investment is mainly attributed to roads and water supply and sanitation. In electricity, direct public investment declined, while quasi-public investment through *Proyectos de Impacto Diferido en el Registro de Gasto* (Projects with Deferred Impact in the Budget Registry, PIDIREGAS) increased until 2002, but dropped significantly in 2003.

improvements; (vi) land for social housing and for urban development; (vii) urban planning and local development agencies; and (viii) urban equipment and image of the city.

¹⁹ IDB supports a similar program in Brazil. The Habitat-Brazil which has yet to be implemented on the same scale as Habitat. Additionally, Brazil never had a consistent national program of support to municipal infrastructure along the lines of FAIS/*Ramo* 33.

²⁰ The 2006 federal budget allocates MXP 25 billion for FAIS (*Fondo de Infraestructura Social Municipal*), in contrast, this same year the Hábitat program received MXP 2 billion. There is not data to compare allocation of resources, however to the extent that FAIS is spent throughout the municipality and Habitat is restricted to the poorest urban areas predefined by SEDESOL it can be assumed that it is better targeted.

²¹ This may entail some form of titling; basic infrastructure, social sectors, public safety; and access to finance. Some elements of FONHAPO's subsidy programs that are directed towards the poorest like *Piso Firme* could also form part of this program as can other credit and subsidy programs for home improvement within slums.

²² These estimates cover roads, ports, railroads, electricity, and water and sanitation. Schools, health infrastructure, urban transport, housing, airports, irrigation, and gas are examples of sectors that are not included in these estimates.

Table 6: Public Infrastructure Investment, 1998-2003

	Billion 2003 Mx Pesos	As a Share of Public Investment	As a Share of GDP
1998	64	39%	1.06%
1999	64	36%	1.02%
2000	69	31%	1.04%
2001	68	32%	1.02%
2002	84	34%	1.26%
2003	83	28%	1.23%

Source: World Bank calculations based on agency reports.

28. **In contrast, spending in the housing sector has increased over recent years.** Public and private investment in housing increased from (Mxp) 59,000 million in 2000 to 183,205 million in 2005, which represents an increase of almost 185 percent. Most of this investment has been directed to finance finished housing, the share of which has even increased from 93% of total housing finance in 2000 to 97 percent in 2005 and largely targeted households earning more than three minimum wages. In contrast, the relative share of investment in progressive housing or infrastructure (including land) - housing solutions that favor the lower income segments - has declined from 3 to 1 percent and from 0.4 to 0.1 percent respectively.²³

Distribution of Spending

29. **Across infrastructure sectors, public spending is heavily weighted toward new construction and upgrading, while regular maintenance activities are underprovided.** In roads, federal maintenance expenditures have been insufficient to keep the network in good condition. In the electricity sector, the approved budgetary resources for maintenance, operation, and repair have been on average 30 percent below the amount requested by CFE. In water and sanitation, investment favors new construction, and insufficient maintenance affects the quality of service. This all points to substantial future investment requirements for rehabilitation, and highlights the need for better incentives and funding mechanisms to promote better management of existing assets.

30. **The Mexican Government does not calculate total public investment in infrastructure, but World Bank estimates in recent studies suggest that public spending on investment and maintenance in roads, water and sanitation, and electricity was around MxP 82 billion in 2003, about 1.2 percent of GDP.** This does not include the electricity subsidies, mentioned earlier, which are for consumption purposes, but it does include the quasi-public financing for the electricity sector done through the PIDIREGAS financing scheme. About half of this investment is for the electricity sector, and a quarter is for roads. The remainder is mostly for water, with a very small amount allocated to ports and rail.

²³ Data from *Anexo Estadístico de Sexto Informe de Gobierno 2006*, along with data from CONAFOVI.

31. **Spending in housing is weighted toward the middle income segments.** The housing sector is dominated by the provision of finance for finished housing by public funds that provide more than 60 percent of housing finance through subsidized loans. The majority of the poor population is either not affiliated to these funds²⁴ or does not benefit from them given their low income level.²⁵ This results in a strong bias towards middle and higher income segments. The most important federal program for low income housing is the *Tu Casa* subsidy program, but this program remains small – representing around 12 percent of the total number of subsidies delivered (including implicit and explicit subsidies) during the first semester of 2006 - and has suffered from important operational constraints at local level.²⁶ The expansion in recent years of investment in middle and higher income segments needs to be complemented with higher investment levels in low-income housing solutions, such as progressive housing and infrastructure financing.

Future Investment Needs

32. Making estimates of future investment needs is fraught with difficulties—it depends on sectoral goals in terms of quality and coverage, and requires assumptions about future prices and demand growth. Nevertheless, this note offers a series of estimates associated with different policy goals.

33. **By modestly increasing expenditures on maintenance and investment, Mexico should be able to improve the quality of its infrastructure and achieve some key policy goals (such as universal coverage in water and sanitation and electricity, and the completion of major road transport corridors).** Indeed, investment and maintenance needs estimated by Mexico’s infrastructure agencies (*Secretaría de Energía--SENER*, *Comisión Federal de Electricidad --CFE*, *Secretaría de Comunicaciones y Transportes --SCT*, and *Comisión Nacional del Agua--CNA*) for electricity, roads, water, and sanitation, respectively) are modest at around MxP 83 billion for 2006. Adding sufficient resources to adequately maintain networks and slightly accelerate the completion of major policy goals (such as universal coverage in water and sanitation and electricity) increases this estimate somewhat to about MxP 102 billion. Depending on GDP growth performance, this would represent 1 percent to 1.25 percent of GDP.

34. **Such a rate of spending, however, would not allow Mexico to reach the level of infrastructure per capita of other OECD countries or faster-growing East Asian countries.** Indeed, countries like the Republic of Korea, which trailed behind Mexico in terms of infrastructure coverage in the 1960s, invested over 3 percent of GDP per year on average in infrastructure over recent decades—as have China, Indonesia, Thailand, and other competitors that are catching up rapidly and surpassing Mexico in terms of infrastructure quality and coverage. This highlights the urgency of reallocating untargeted subsidies—such as the 0.7 percent of GDP currently spent on electricity consumption

²⁴ Estimates from recent studies suggest that only 24% of the population in need of housing (including improvements) is affiliated to INFONAVIT or FOVISSSTE.

²⁵ The share of housing loans to below 2 MW households affiliated to INFONAVIT and FOVISSSTE during 2005 was 8% and less than 0% respectively.

²⁶ During this period the *Tu Casa* program reported the highest number of subsidies delivered for comparative periods since the program was launched.

subsidies—toward productive investment and maintenance, and of improving expenditure efficiency more generally. Moreover, responding to the need for increased resources and, most important, increased efficiency in the use of these resources, will require new and different uses of private sector participation and refined credit-enhancement schemes to attract financiers, investors, and operators to Mexico’s infrastructure market in a more cost-effective manner.

35. Looking at individual infrastructure sectors, the primary financing challenge for the road sector will be to ensure adequate funding for rehabilitation and maintenance of the existing network. While the new concession scheme and public–private participation program (known as the PPS) could hope to leverage private investment in the highway program, current annual levels of financing will have to increase by 30 to 40 percent in order to fund maintenance and rehabilitation needs and bring all roads in the primary federal and state networks to fair-to-good condition. The expansion of multiyear, output based rehabilitation and maintenance contracts, which are bringing good financial results and increasing roads quality of service, would help achieve this goal in a cost-effective manner.

36. In other infrastructure sectors, a mix of improved efficiency of spending and additional resources could improve performance. For electricity, the challenge is to find new financing instruments that will mobilize large amounts of money, given the shortcomings of the current PIDIREGAS scheme and other structural constraints in the sector. In terms of housing a substantial increase in spending is called for to begin to address the needs of the lowest income segments and the housing demand backlog. Spending needs to shift toward supporting land, services and gradually constructed housing rather than the current focus on finished financed housing to middle income households.

TARIFFS, SUBSIDIES, AND COST RECOVERY

37. Mexico lacks a coherent national policy framework for setting—and linking—infrastructure tariffs, subsidies, and cost-recovery goals. An office in the SHCP Undersecretariat of Revenue sets the electricity tariffs.²⁷ The office strives to follow technical considerations of the sector in setting the rates, but political factors loom large in the final determinations, and there is no multisector strategy to assure that an adequate package of safety-net programs are well targeted to the poor, and that the rates give appropriate incentives for conservation. Similarly, in the case of housing subsidies, the national housing council, CONAVI, is charged with housing policy including subsidies, in collaboration with FONHAPO. In practice a large amount of subsidies affecting the quality and quantity of housing come from off-budget sources (INFONAVIT and FOVISSSTE) and from urban programs (HABITAT and FAIS/*Ramo* 33), over which CONAVI has little control over the structure or targeting of assistance.

38. Pursuit of cost-recovery tariffs, which would reduce the strain on public finances and facilitate private participation, would be more feasible if subsidies were targeted to low-income groups. Moreover, although socially directed infrastructure tariffs

²⁷ This same office sets the water abstraction charges owed by the local water operators and those enterprises drawing water from the source.

and subsidies can contribute to poverty reduction, through expanding access to basic services and reducing charges, such subsidies are not usually the optimal way to help the poor. As more efficient antipoverty programs, such as *Oportunidades*, widen their coverage, Mexico could consider phasing out generalized utility tariff subsidies (as they already did with food subsidies) and shift to poverty targeting cash transfers.²⁸

39. **The absence of overarching subsidy policies —and the multiplicity of federal, state, and municipal stakeholders involved—produces a wide variation in the degree of cost recovery and subsidies across sectors and regions.** Tariffs are set well below costs for some areas and users—even those who could pay. The most common form of user subsidy in Mexico is through low tariffs for certain consumer categories in electricity, water supply, and sanitation. These are usually financed directly or indirectly from the federal budget, but some subsidies are funded by states and municipalities. One of the major subsidies—in electricity—is financed through the nonpayment of *aprovechamientos* (levies) due by CFE to the Federal Government. Subsidies through the *Fondo de Inversión en Infraestructura* (Infrastructure Investment Fund, FINFRA) are indirectly paid by the Federal Government in the form of foregone dividends for subordinated equity.

40. **Subsidies for infrastructure services absorb significant public resources in Mexico, encourage inefficient resource use, and do not effectively target the poor.** For example, subsidies (for operations and consumption) in the electricity sector amount to about 1.1 percent of GDP and are highly regressive. Federal programs in the electricity sectors disproportionately benefit richer states, municipalities, and households, for which improved cost recovery and tax revenue mobilization could easily finance part of their infrastructure. In the case of housing, the current subsidy system increases inequality; as low-income households and those employed in the informal sector receive little or no support while those employed in the formal sector with wages between 3 MW and 7 MW receive relatively high subsidies.

41. **The Mexican Government has incorporated a modest degree of poverty targeting in its transfers to subnational governments,** mostly through FAIS/*Ramo 33*. In 2002, 47 percent of the investments funded by FAIS were used in the electricity, water and sanitation and transport sectors. About half of it went to water and sewerage, with the remainder split equally between rural roads and electricity distribution to rural and marginal areas. However, the majority of federal infrastructure spending, subsidies, and transfers are not targeted for poverty reduction, and the distribution strongly favors the wealthier states and localities. Non-FAIS federal spending for water and sanitation in the wealthiest eight states in 2003 was two and a half times higher per capita than in the poorest eight states (Barocio 2005).

Electricity

42. **In electricity, average tariffs still fall short of covering costs, despite steady nominal increases over the past 15 years.** Substantial subsidies are applied in varying proportions to different categories of users. Tariffs for commercial and industrial users are

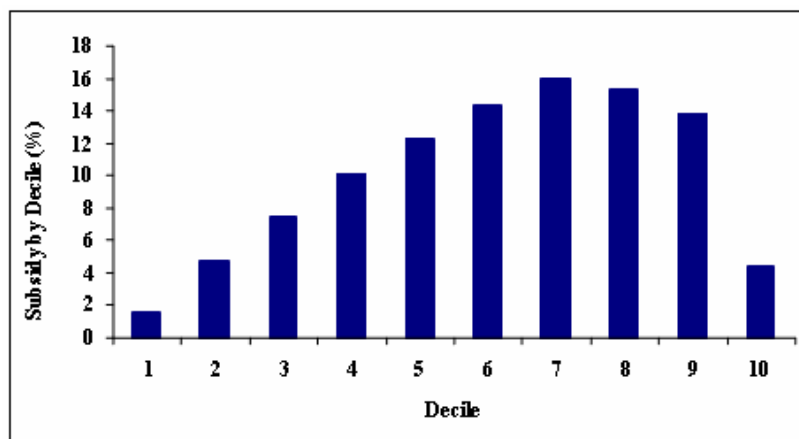
²⁸ See Chapter 4 for more details on cash transfer programs.

set near levels allowing full recovery of the cost of supplying these consumers. However, average residential and agricultural tariffs covered only 42 percent and 28 percent of cost, respectively, during 1997–2003 period.²⁹ The incidence of residential subsidies stemming from current tariff structures is regressive, benefiting mainly the upper-income households and richer states.

43. **Residential tariffs are well below the OECD average, while industrial tariffs are higher than the average of OECD countries and the United States.** Independent sources indicate that peak industrial electricity tariffs are more than four times higher than the costs of producing electricity on-site with diesel-based thermal plants.³⁰ High industrial tariffs have led to an increasing trend toward self-supply by industries during peak hours. Compared with the electricity tariffs in other Latin American countries, commercial tariffs are among the highest tariffs in the region, while industrial and residential tariffs are close to the regional average.

44. **Residential electricity subsidies are highly regressive:** Upper middle income households (income deciles 6, 7, and 8), receive the majority of the consumption subsidy (see Figure 6). The electricity subsidies also go mostly to the more economically developed regions. The vast majority of the subsidy—over 90 percent—is not a lifeline for the poor and encourages inefficiency, especially in hot regions in the summer, which benefit from highly subsidized rates. Poverty criteria are absent in the determination of regional electricity tariffs. International evidence suggests that tariffs that are geographically differentiated on the basis of even crude assessments of marginality are mildly progressive. Meanwhile increasing-block tariffs,³¹ which are common in Mexico and in many other developing countries, benefit mainly the better off because the middle blocks are also subsidized and non poor households tend to consume more than the poor.

Figure 6: Distribution of Electricity Subsidies by Household Decile



Source: World Bank (2005).

²⁹ For 2005, cost recovery for residential and agricultural tariffs was 39 and 28 percent respectively, and 86 and 85 percent for commercial and industrial tariffs.

³⁰ Instituto Tecnológico de Estudios Superiores de Monterrey (2004), quoted in World Bank (2005).

³¹ With an increasing-block tariff, consumers face a low volumetric per-unit price up to a specified quantity (or block), and then for any amount consumed over this quantity, they pay a higher price up to the limit of the second block, and so on.

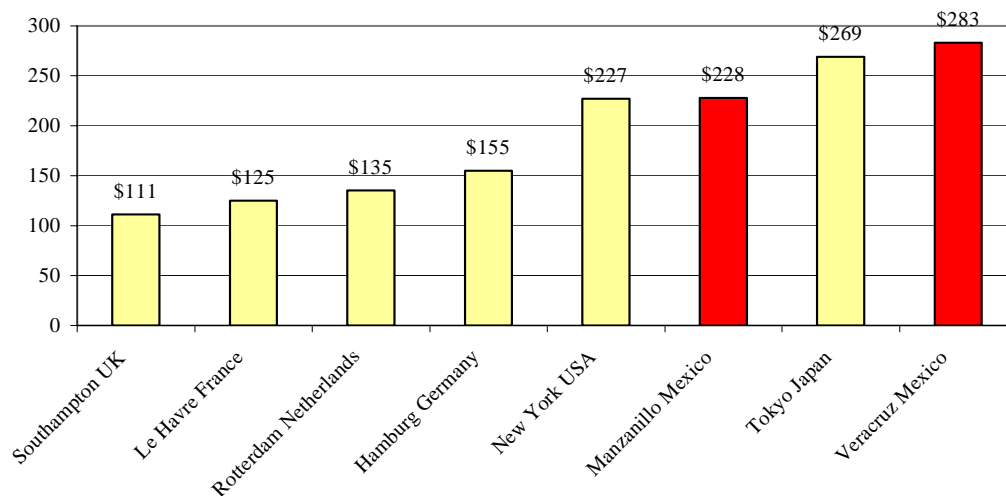
Transport

45. **Toll-road tariffs are high by international standards and despite reductions in the late 1990s, high fares have kept the use of many toll roads below capacity.** Estimates suggest that toll tariffs would have to be reduced significantly to have a real impact on traffic patterns. This is largely due to many free roads that compete with toll roads for freight and passenger traffic. After the substantial reductions of the 1990s—from 12 to 2 Mexican pesos per truck and kilometer in constant prices in the case of roads owned by *Fideicomiso de Apoyo al Rescate de Autopistas Concesionadas* (FARAC)—tariffs have been stable since 1998.

46. **Toll setting has been based mostly on financial needs, for which FARAC debt weighs heavily, rather than economic considerations which incorporate demand patterns and country competitiveness concerns.** The FARAC technical committee is currently looking at an overall review of toll levels and structure.³² At major ports, which are commercial enterprises, and railways, which are largely privatized, charges cover the full costs of good-quality service, demonstrating that such models can work in Mexico.

47. **Costs for railway services are higher in Mexico than in Brazil or the United States, which is partly explained by cargo characteristics.** In the United States and Brazil, minerals account for a majority of the cargo that can be transported at a lower unit cost. In Mexico, due to the relatively low share of cheap bulk cargo and the scattered origin and destination patterns, train operation is necessarily more costly. Nevertheless, the lack of competition among concessionaires, due to the ineffectiveness of interchange rules and insufficient intermodal competition, also contribute to high tariff levels.

Figure 7: Post Tariff for a 2,800 Twenty-foot Equivalent Unit (TEU) Ship (thousand dollars)



Source: Instituto Mexicano para la Competitividad (2003).

³² For an analysis of road toll-setting criteria, see R. Carruthers and R. Basu, “The Theoretical and Practical Basis for Setting Road Tolls,” World Bank, Transport and Urban Development Department, 2004.

48. **Port tariffs are generally higher than international benchmarks when all charges are considered.** Tariffs for port infrastructure use include two main categories: charges to vessels and charges to cargo. International comparisons are of limited value, since these two concepts are not homogeneous across ports. Mexico charges low tariffs per transferred ton on ports (US\$1.4 in Veracruz compared with US\$6.68 in Los Angeles). However, tariffs are much higher when all charges are considered (like shore-to-terminal cargo handling or customs agent payments), as shown in Figure 7.

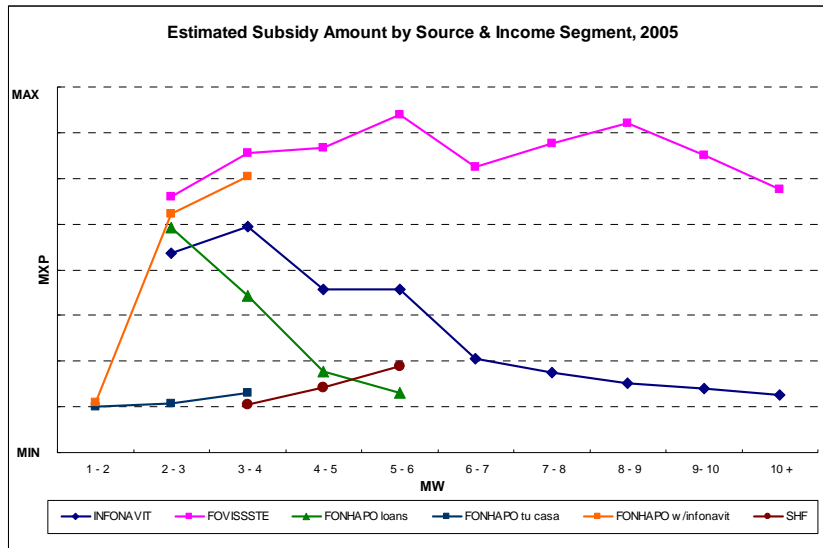
49. **In urban transport, there is no clear subsidy policy, although some subsidies have been provided for urban rail mass transit such as the Mexico City and Monterrey subway systems.** As systems modernize, the Government should assess the appropriateness of a rational subsidy policy. Sprawling urban metropolitan areas are making the journey to work excessively long and costly, particularly for many of the very poor. Surveys of commuters in Mexico City have shown that 20 percent of workers spend more than three hours traveling to and from work each day, and that 10 percent spend more than five hours. Poor people's inability to access jobs and services due to transport cost and time is an important element of the social exclusion that defines urban poverty. Urban transport policy can help relieve this poverty, both by contributing to economic growth and by introducing a conscious poverty focus to infrastructure investments, to public transport service planning, and to fare-subsidy and financing strategies.

Housing

50. **There has been considerable expansion in the provision of up-front housing subsidies during the past few years, reaching more than 300,000 households during the period 2000 to 2005.** During this period, INFONAVIT, improved its performance dramatically, allowing growth in its subsidized portfolio. Accordingly, the implicit interest rate subsidies provided by INFONAVIT and FOVISSSTE continue to dominate public support for housing, making up 96 percent of subsidies to the sector. The number of upfront, on-budget subsidies issued through FONHAPO decreased in recent years due to administrative hurdles, competition with higher and more efficient subsidies through INFONAVIT and the difficulty of obtaining local government counter-part funding (a component of the *Tu Casa* program). CONAVI estimates of the amount of subsidies per agency (prepared in coordination with other major housing agencies) are presented in Figure 8.³³

³³ The method for the calculation of the subsidy for implicit interest rate subsidies was the present value of the cashflow difference between interest rates charged by the agencies for different income groups and an SHF calculated risk adjusted market interest rate for that income group. More recently INFONAVIT has changed the method of calculating the subsidy it provides, focusing on its internal cross-subsidization of mortgage for different minimum wage levels and comparing interest rates charged to a theoretical base rate for the institution, which is based on its costs of funds and actual risks, rather than a market rate. This method dramatically lowers the amount of subsidy, but not the number of subsidies issued.

Figure 8:



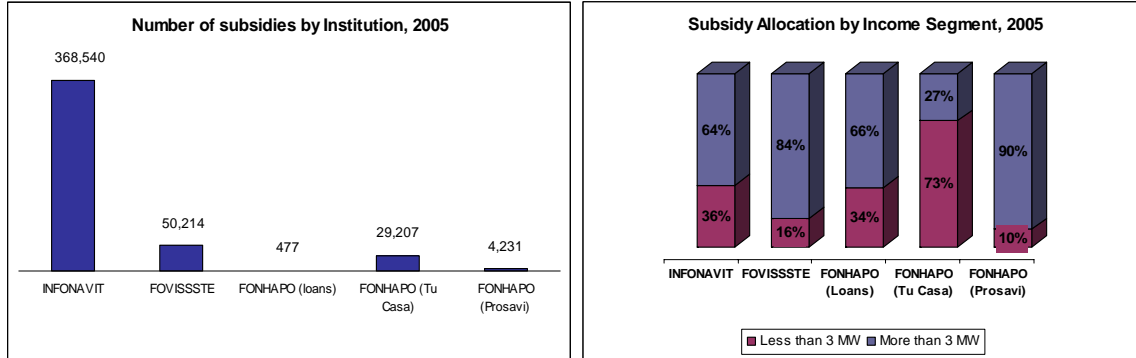
Source: Own calculation based on CONAVI data. Notes: Estimates are calculated using market rates as reference rates. Only federal subsidies are included. Data for Fonhapo /Tu Casa includes the up front grant plus the implicit interest rate subsidy.

51. **While subsidies have increased in recent years, on-budget expenditures continue well below what is needed to address the housing deficit.** The Federal Government spends about 0.11 percent of GDP on explicit housing subsidies targeted to low income households (i.e. excluding INFONAVIT and FOVISSSTE implicit subsidies). This is significantly less than the peak reached by Chile in the mid 1980s (1.3 percent of GDP), when it started its concerted and largely successful effort to eliminate its housing deficit. It is also lower than that of many countries in Western Europe. Moreover, the overall subsidy allocation is regressive. Given that INFONAVIT and FOVISSSTE provide interest rate subsidies linked to mortgage credits, subsidy allocation is in principle inequitable with amounts increasing with higher loan amounts (and likely incomes). INFONAVIT is compensating for this effect by increasing the interest rate for higher income brackets.³⁴ Even so, only one third of all subsidies benefits households below 3 MW, whether in number of beneficiaries or in total amount of subsidy (see Figure 9).³⁵ This outcome is related to the predominance of mortgage-linked subsidies for which low-income households do not qualify, and the focus on reaching Government’s new housing goals rather than stimulating the more affordable resale market.

³⁴ Current subsidized interest rates by income level are: 4% for 1 minimum wages, 5% for 2 minimum wages, 6% for 3 minimum wages, 8% for 4 minimum wages and 9% for 5 minimum wages and above. This latter rate is close to the current market rate for that income group.

³⁵ In reality, this figure is slightly higher since the *Tu Casa* federal subsidy amount is only half of the total subsidy received by beneficiaries, since the other half comes from local government.

Figure 9:



Source: World Bank calculation with data from CONAVI

52. **Expanding access of the poor to housing will call for more than harmonization of subsidy amounts across income groups.** The next wave of reform should contemplate moving subsidies down market, by introducing new instruments (e.g. mortgage payment buy-downs and payments for part of the mortgage insurance premiums), linking subsidies to resale housing and serviced plots, and conditioning funding on land management reforms and facilitation of permitting procedures. Current on-budget resources are insufficient to address the problem and should be scaled up. Off-budget subsidies provided through INFONAVIT and FOVISSSTE should be aligned with government subsidies. Efforts are already underway to strengthen micro-credit for housing and improve savings options. The scaling up of a more competitive and affordable housing microfinance industry could be supported by Government – for example through SHF – without necessarily channeling subsidies immediately through this network. Implementing such reforms will require strengthening CONAVI and the discontinuation of lending from FONHAPO.

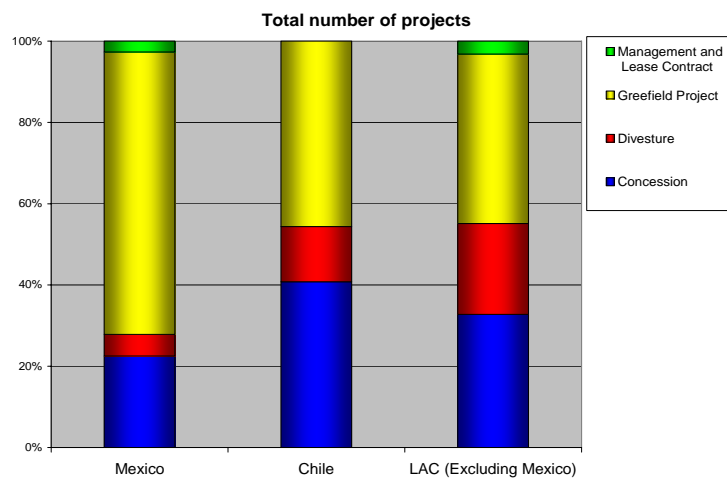
PRIVATE SECTOR PARTICIPATION—LIMITED AND COSTLY

53. **Since 1994 private sector participation and financing in transport, electricity, water, and sanitation in Mexico, while growing substantially over prior periods, remains lower than in its peers in Latin America** (Argentina, Brazil, Chile, and Colombia). Mexico was one of the first countries in Latin America to attract significant private participation in infrastructure (PPI), but after the collapse of the road-concession program in the early 1990s, PPI decreased and has remained modest since. Compared with other relevant countries, Mexico has not had significant private investment in energy and water distribution services. The energy sector (electricity generation through the PIDIREGAS) has attracted the most private financing, followed by transport, especially for railroads and airports.

54. **In addition, the approach to PPI in Mexico—particularly for the segments that provide service directly to retail consumers—has limited the efficiency gains that normally arise from private participation.** PPI in Mexico has mostly been in upstream, greenfield, activities such as electricity generation and highways. In contrast, in the rest of Latin America, PPI in roads, water and sanitation, and electricity has mostly taken the form

of concessions or divestitures for *existing* infrastructure and expansion of networks to serve additional segments of the population (see Figure 10). Mexico’s lack of reform of existing service providers has limited the efficiency gains that usually occur from involving the private sector in the operation of infrastructure services (improvements in commercial and technical efficiency). Moreover, PPI involvement has typically taken the form of “take-or-pay” agreements with substantial guarantees from the government. These implicit but costly forms of fiscal support have been necessary because private producers could not be enticed to sell their output to public utilities which were not, in and of themselves, financially viable purchasers or if creditworthy, were subject to government controls which raised the risk of lack of future payment capacity.

Figure 10: The share of PPI allocated to greenfield projects has been high in Mexico, 1990-2005



Sources: World Bank PPI Database; authors’ calculations.

55. **This is all the more surprising given Mexico’s good sovereign risk and credit ratings, its macroeconomic stability and general success in attracting foreign direct investment, and the depth of local capital markets.** Indeed, Mexico is probably one of the few developing economies today that could fairly easily attract substantial amounts of private capital for infrastructure.³⁶ The new private sector participation schemes being developed and implemented provide an opportunity to increase efficiency and reduce the scope of sovereign guarantees provided by the Federal government.

56. **Urban Transport in contrast has experienced more private involvement directly linked to users.** With the shift towards bus rapid transit systems (BRT, such as the Federal District’s Metrobus), urban transport improvements are increasingly deploying a model of infrastructure being provided by the public sector, with private supply of the vehicles. For example for stage I of the Leon BRT, bus owners and operators actively participated in the planning and fundamentally, in the financing of the system. The value of their contribution (mostly bus replacement) was estimated at MxP\$ 230 million Pesos – a

³⁶ Private flows to infrastructure in Latin America have collapsed since the peak year of 1997, partly because of the economic crises in East Asia and Argentina, but also because much of the more attractive divestiture operations (mostly in telecommunications and power) have already taken place.

significant contribution given the total Stage I system cost estimate of MxP \$430 million. Similar public-private partnership arrangements are planned for the proposed Stage 2 of the Leon system.

57. **In the case of housing finance, the system in Mexico is still largely dominated by public lending, though private lending has increased and the efficiency and competitiveness of public lending has improved.** SHF has been effective at sustainably fostering private lending to otherwise under-served households. SHF financing has permitted SOFOL loan balances to grow at 20 and 30 percent per year. As its liquidity window comes to a close in 2009, SHF's mortgage default insurance (MI) and financial guarantees will continue to provide a base for private sector growth.³⁷ Financial guarantees foster the growth of mortgage securitization, providing a funding source for mortgage lenders. In the last four years, the outstanding amounts of securitized loans in the Mexican debt markets went from less than US\$100 million to US\$1.1 billion in mortgage backed securities and US\$1.2 billion in securitized construction loans. As the private sector moves into moderate income lending, SHF should set its product parameters to increasingly address lower income segments.

58. **INFONAVIT still plays a dominant role in the housing market, though declining interest rates, increasing operational efficiency and progressive loan pricing has reduced its degree of crowding out.** Importantly, INFONAVIT has widened its cooperation with the private sector, providing its members with the ability to better leverage their INFONAVIT savings accounts for a combined public and private loan or use their savings as a down payment for a private sector loan. INFONAVIT should further explore means to extend these products to households earning less than 5 minimum wages.

INSTITUTIONAL CHALLENGES

59. **Achieving better quality, access, and efficiency in infrastructure services will require stronger institutional arrangements, with increased coordination and planning within and across sectors, and greater accountability.** The role of the Government in infrastructure planning has changed over time, shifting its focus from public investment programs to issues of strategic direction, decentralization, private sector participation, and financial support. The housing sector calls for similar efforts to clarify institutional roles between CONAVI, FONHAPO and SHF. FONHAPO has outlived its usefulness, and its responsibilities should be passed to CONAVI and SEDESOL. Over the long term, the conflicting roles of INFONAVIT and FOVISSSTE as pension funds, mortgage lenders and subsidy providers should be resolved.

60. **Central coordination is essential, given the cross-cutting nature of these issues and their economic and political impacts.** Disjointed decision making about funding allocations has contributed to sector outcomes not linked with national development priorities. The process is least fragmented in the electricity sector, which is centrally managed. In housing, the recently approved housing law gives CONAVI a wider mandate to exercise direct control over the on-budget subsidy programs and to coordinate housing

³⁷ MI helps to make mortgages affordable for moderate income households by reducing down payment requirements. MI promotes financial system stability by allowing for greater distribution of risk among system participants.

with urban planning. Exercising this role will allow better coordination of subsidies with national housing policy. Central budget funding should be used to prioritize activities that pursue the government's objectives of enhancing competitiveness and reducing poverty.

61. **Closer coordination between the planning processes of national and state governments and the annual budget formulation process is necessary to set more realistic and attainable goals.** Across all sectors and national and subnational government agencies, policy planning and coordination should be better linked.³⁸ One area to focus on is increasing the incentives and technical assistance for subnational planning. This is critical to the housing and transport sectors. There should also be better horizontal coordination among the various municipalities within metropolitan regions.

62. **To strengthen planning and link it more closely to budgeting (centrally and within sectors), the government could build on the annexes of the budget that project the future year outlays for individual investment projects, particularly in electricity and transport.** From this, one could project multiyear resource envelopes for programs and sectors (not just individual projects), which would include debt service and operations and maintenance.³⁹ Such envelopes would be indicative and need subsequent Congressional approval in each year's budget. CFE already follows this approach and the *Secretaria de Comunicaciones y Transportes* (Ministry of Communications and Transport, SCT) is moving in that direction. The use of multiyear resource envelopes also eliminates the need to divide larger projects into components that can be finished in a year or less, with the higher total costs that entails.

63. **The government could also strengthen the authority of the secretariats for transport and energy and housing authorities to allocate indicative multi-year budget ceilings within their sectors and monitor and disclose compliance with performance targets for the key agencies that report to them.** For the sectors that involve several levels of government, namely housing, roads and water, experience in the United States and other federal nations in the OECD shows the value of using matching grants, with multiyear projections and dependence on meeting performance standards.

64. **Being accountable and meeting performance standards requires systems for the evaluation of large-scale federally funded programs, with respect to their efficacy and efficiency in achieving measurable quality and sustainability of service outcomes.** An ex-post evaluation would provide valuable information on what strategies work and why—informing the design of future programs. Such evaluations can also help establish incentives for good performance and lead to greater transparency. This often calls for better data collection, as is the case in the housing sector.

THE WAY FORWARD—A BETTER USE OF PUBLIC AND PRIVATE RESOURCES

³⁸ Between 2001 and 2005 the Tu Casa subsidy program has allocated on average 32% less than its approved budget largely due to lack of coordination between FONHAPO and local governments.

³⁹ Annexes 4 and 6 of the budget give projections of investment outlays for several years of all electricity and road projects (hundreds) that are included in the budget for that year. Besides giving more detail than policymakers, Congress, or the public need to know, the annex tables do not give any indication of the expected flow of future investment totals, because most individual projects will end in the current fiscal year, so the future-year aggregates are always much less than half of the present year.

65. **We propose seven main recommendations in this note pertaining to public sector funding, private financing, and the overall institutional environment.** The following paragraphs present the general recommendations and the table in Annex 1 provides details by sector and theme.

Public Sector Funding

66. **First, public investment needs to make more effective use of taxpayer resources and to be more focused on areas that the private sector cannot finance.** This means reducing the role of the government in financing the electricity sector and toll roads, which have made substantial fiscal demands (many of them off-budget or contingent) and for which there is significant scope for increased private participation. The housing funds could expand their products that promote private participation – such as *Cofinanciamiento* and *Apoyo Infonavit* - for a larger proportion of their above 5 MW beneficiaries, while on budget subsidies should focus on the below median income groups. By the same token, this implies improving the efficacy of spending in traditional areas of public finance such as non-toll roads.

67. **Three sets of policy instruments—competition, financial markets, and regulation —could strengthen incentives for service providers to improve efficiency.** Competition is notably absent from the electricity sector due to the statutory monopolies of CFE and LFC.⁴⁰ In the housing sector, the public housing funds dominate the market, and have hindered the development of a diverse supply of housing solutions. By contrast, in transport, there are substantive competitive forces through intermodal choice, directly competing ports, and the presence of “free” roads in toll corridors. Private finance has been permitted in a few segments of infrastructure, but the structure and coverage of federal financial guarantees have muted the incentives for improving operators’ performance, as discussed below.

68. **Interim measures could improve efficiency and strengthen accountability for performance, without major changes in industry organization.** These include programs to enhance the autonomy and service orientation of public sector operators. In toll roads, the strategy should look at returning the current FARAC network to private concession, a process that will likely take several years. In the short run, improvements can be made through outsourcing FARAC’s toll-road maintenance. In housing, improving the corporate governance in INFONAVIT has improved efficiency and increased transparency and similar efforts could yield important results in FOVISSSTE.

69. **Second, the incremental public funding released through greater resource efficiency should focus on three areas: maintenance and rehabilitation, strategic bottleneck infrastructure segments, and extension of basic services and housing to the poor.** Additional resources need to be allocated on an ongoing basis to preventive maintenance and renovation, particularly for highways and electricity distribution, where the rate of return to such spending is much higher than to new investments. Examples of strategic segments of networks include electricity transmission, road links in the strategic

⁴⁰ For a more detailed discussion of regulatory institutions, see chapter 4.

corridors, and rail/highway urban bypasses. Such investments need not be large, but have important strategic value, and in some cases could be co-financed with the private sector.

70. **Devoting a greater share of federal resources to infrastructure for the poor does not imply an absolute increase in spending.** On the contrary, targeting retail subsidies in electricity (and water) to poor communities and poorer households in better-off urban areas would release substantial resources for other uses. Subsidies should focus in the first instance on facilitating access of the poor to the service and extending coverage in small localities. To the extent that consumption of these groups merits subsidization, it should be limited to satisfying minimum basic needs. In the case of housing, the current low levels of on-budget subsidies merit scaling up if the Government is to seriously attack the housing deficit in the three minimum wage segment and below. Though greater scale is called for, delivering service and housing to the poor need not be costly, and relaxing technical norms governing choice of technology and billing methods have proven their worth in other countries. Examples include off-grid energy solutions for electricity. Similarly, shifting the current bias for new housing towards programs that promote progressive housing and housing improvements and better targeting to poor households could represent a more efficient use of resources.

71. **Third, better design of investment programs and selection of projects would improve outcomes.** To improve the cost-effectiveness of federally funded programs and thus reduce the magnitude of subsidies from the budget, closer coordination is required along several dimensions: i) between sectoral agencies and the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público*, SHCP) to keep long-term sector development plans in line with budgetary and broader fiscal realities; ii) between the SHCP and sector ministries to weed out projects of questionable viability; iii) among sectoral agencies to ensure balanced sector development (for example, gas–electricity in energy, and multimodal planning in transport); and iv) across levels of government (for example, regional transport planning and coordination of housing finance and provision of urban land).

72. **Even with limited competition, regulation, and financial market involvement, the government could still discipline operators' performance by making the size and type of transfer dependent on improvements in efficiency and service.** Such performance-based allocation could be applied in sharing toll-road short and long term efficiency gains between the SCT and SHCP.

73. **For performance criteria to genuinely affect resource allocation decisions, future resource availability needs to be predictable, such as through multiyear resource envelopes and budget ceilings.** This is already done to some degree for large individual electricity projects and to a lesser degree for transport, but should be applied to entire programs. Even in the interim, as procedures and systems are established for performance-based budgetary allocation, multiyear budgeting for infrastructure would permit more effective planning and efficient program execution.

Private Finance

74. **Fourth, private finance for infrastructure could be mobilized to a much greater extent to leverage public resources.** While the present outlook for rails, ports, toll roads, and housing appears promising, this is not so for electricity, even in segments that have historically attracted significant private finance, such as thermal power plants. Concerns about operators' present and future creditworthiness, the Federal Government's future willingness to step in to cover subnational or public enterprise obligations, and the lack of arms-length regulation strongly limit investor interest. Rather than having taxpayers assume still greater risks to attract private finance, efforts should be directed at the source of the uncertainty: namely the likelihood of political interference in the capacity of the purchasing distributor to pay for the service. The new concession scheme for state highways goes in this direction. Similar innovation is needed in the electricity sector.

75. **Fifth, federal credit enhancements will be required to attract sizable sums of private funding from domestic and international sources, but their design and functioning need revision.** To date, projects under federal jurisdiction have generally been backed by full guarantees of cash flow (for example, PIDIREGAS for electricity) or equity returns (FINFRA). This requires the government to take on more risks than necessary, and hence carry commensurately larger contingent liabilities. Since the Federal Government has an investment-grade rating on sovereign debt, it could offer narrower types of guarantees in the form of negative covenants, such as insurance against political and regulatory risk. For subnational projects, negative covenants may also reduce financing costs, but the enhancements will also require some kind of security based on assets or cash flow. These could take the form of state-level revolving funds for transport and other local infrastructure services. Such risk insurance and backstopping facilities should also help shift private finance toward distribution networks that interface with consumers. In terms of housing finance, SHF has played a critical role in leveraging private investment, at first through second tier financing and more recently through guarantees and insurance. The next challenge will be to expand their support to SOFOLs for finished middle income housing to support for lower cost housing products, and to expand financial support to lenders providing micro loans for lower income segments.

76. **Sixth, arms-length regulation of tariffs and service quality is largely absent at present.** Improved regulation, especially in electricity, could improve the performance incentives for public sector providers, as well as set the environment for more effective private investment as the sectors open. Improving sector performance will require greater clarity and coherency in policy goals and instruments, institutional responsibilities for establishing and regulating service providers, and pricing policies commensurate with those goals. The goals should make explicit the major policy decisions, such as the desired levels of access and service quality, the required levels of investment and potential sources of financing, and how noncompliance with regulations would be sanctioned.

77. **Other modifications of institutional arrangements should be considered.** For investors and operators to take on some risks now borne by the government and Mexican taxpayers, greater predictability of future cash flows is required, which is dependent on how tariff and service standards are set and adjusted. For electricity, this implies empowering

the Energy Regulatory Commission to function as a sector regulator, with oversight of retail tariffs, service quality, and contracts between CFE and service providers, including private generators and gas suppliers. For railways, the SCT should clarify the rules for service access among carriers. For highways, the SCT should expand the current pilot program for multiyear, standards-based contracts for maintenance.

Overall Institutional Environment

78. **Seventh, moving forward on the above recommendations will require greater accountability and better information on performance outcomes.** There is little systematic information on whether projects have had good or bad results, and such information rarely has any budgetary consequences. Sectoral agencies and subnational governments are demanding greater autonomy in investment planning, execution, and financing. Effective accountability should accompany this autonomy. Indeed, without reliable, verifiable information on actual performance, it is risky to respond unconditionally to demands for more autonomy. Rather, increments to autonomy should depend on improvements in accountability. Better performance tracking and information disclosure will require measures like the following: regular reporting by subnational governments on the use of federal transfers, especially Ramo 33/FAIS; and strengthening the *Centro Nacional de Control de Energía*'s (CENACE's) and CRE's capabilities for measuring and reporting on service quality in the electricity sector. Such measures do not require large sums of money, yet they do require building institutional capacities among the concerned sectoral agencies and subnational governments, and sustained political commitment to transparency.

Proposal for a Short-Term Infrastructure Agenda

79. **The immediate priorities for the government would be those measures that preferably will use existing funds more efficiently, save money, or bring in more private sector funding.** Improving the selection of public sector projects, shifting spending toward maintenance, setting up agencies (or granting autonomy to existing ones) for arms-length regulation, and improving transparency could all start immediately.

80. **Improving institutions for transparency and accountability could also start immediately, but will take time to bear fruit.** Bringing more money in and improving targeting of consumer subsidies by electricity rates (closer to costs) on consumption by non-poor households and putting more efficient tariff structures in place will require strong political backing, and thus may be most feasible at the start of the administration. The case is similar for refocusing and increasing housing subsidies. Significant efforts to improve collections of existing tariffs should start immediately.

81. **A multiyear financing plan for infrastructure and housing subsidies (not just particular projects) should be incorporated into the next National Development Plan so that it will be a more practical guide for infrastructure and housing budgeting.** With such a plan and more resources coming in, it would then be appropriate to organize a sustainable increase in infrastructure investment and new housing starts.

82. **An improved regulatory framework will make it possible to attract more private sector participation without the sort of exorbitant guarantees that are common now, fully covering revenue projections.** The Government may replace these with partial-risk guarantee schemes to ensure, on the one hand, that the private sector has an incentive to be efficient and innovative and, on the other hand, that the Government fulfills its responsibilities as a partner of the private sector.

Annex 1: Principal Recommendations and Prioritization

The following table presents the principal recommendations for each sector, broken down by the main themes of this note. Although many of the recommendations may appear quite specific, they interrelate with one another in a number of ways to support increased competitiveness, territorial integration and improved social welfare.

Table A-1: Principal Recommendations by Sector and Theme

	Improving Service Efficiency and Quality	Public Finance: Allocation and Program Design	Private Finance and Credit Enhancement	Institutions, Information, Accountability, Coordination
Electricity	<p>Ramp up multiyear program to reduce transmission and distribution losses through modernization and maintenance of distribution networks.</p> <p>Strengthen capacity and public reporting on systems quality and technical performance (CENACE).</p> <p>Cost-effective technologies should be encouraged to promote access in rural areas.</p>	<p>Establish benchmarking and regulatory accounting.</p> <p>Redesign subsidies (reduce to minimum levels, focus on poor households and small agricultural users).</p>	<p>Increase flexibility of long-term power purchase agreements to reduce risks to CFE/Federation.</p> <p>Contain scope of PIDIREGAS and review structure to reduce burden on PSBR.</p> <p>Increase financing via carbon credits for intensification of natural gas, renewable energy and reduction in gas flaring.</p>	<p>Address LFC functional bankruptcy, to permit commercial operation.</p> <p>Empower CRE to function as regulator: oversight of tariffs, service quality, and contracts.</p> <p>Pursue options to permit buyers and sellers choice: power markets with multiple distribution companies (public or private) and independent transmission company.</p> <p>Consider options for introduction of private management and capital in distribution companies.</p>
Housing	<p>Link <i>Tu Casa</i> housing and Habitat urban infrastructure programs.</p>	<p>Scale up on budget housing subsidy programs.</p> <p>Link <i>Tu Casa</i> and other housing subsidies to local govt. reforms of urban land allocation practices and regulations.</p> <p>Revise subsidy structure in existing programs to eliminate bias toward new housing.</p> <p>Eliminate Fonhapo second tier financing programs for home purchase. Focus its resources on</p>	<p>Expand housing funds' products that leverage private finance sources (eg. <i>Cofinanciamiento</i> and <i>Apoyo Infonavit</i>).</p> <p>Expand SHF support to mortgage lenders that service lower income households and provide micro loans for lower income segments.</p>	<p>Resolve the conflicting roles of INFONAVIT and FOVISSSTE as pension funds, mortgage lenders and subsidy providers.</p> <p>Improve FOVISSSTE transparency and management.</p> <p>Improve the quality and quantity of data available on housing through improving CONAVI comprehensive housing database.</p>

	Improving Service Efficiency and Quality	Public Finance: Allocation and Program Design	Private Finance and Credit Enhancement	Institutions, Information, Accountability, Coordination
		<p>financing home-improvement/ expansion loans to complement capital grants for serviced lots.</p> <p>Move PROSAVI subsidy program toward lower income, but still mortgageable household segments.</p> <p>Provide capital grants for serviced lots.</p>		
Transport				<p>Strengthen coordination among modal agencies to facilitate efficiency gains from multimodal competition.</p> <p>Establish systematic ex post evaluation at project and program levels.</p> <p>Strengthen tripartite coordination at regional level through regional road councils.</p>
Ports				Strengthen oversight of API's planning to ensure port facilities and operations best meet future demand.
Highways	<p>Use multiyear, standard-based contracts to increase maintenance efficiency.</p> <p>Reinforce asset management capacities of states and municipalities.</p>	Continue to strengthen planning processes; demand and cost estimates; allocate resources on technical criteria.		
Toll Roads	Permit FARAC to outsource O&M to private firms. (short term).		Promote a gradual transfer of FARAC network to long term private concessions.	Set an institutional organization to cope with the new concessions, separating policy and planning from regulation and control.
Urban Transport	Promote use of public mass urban transport systems			Promote and strengthen urban transport planning institutes.

	Improving Service Efficiency and Quality	Public Finance: Allocation and Program Design	Private Finance and Credit Enhancement	Institutions, Information, Accountability, Coordination
	(e.g. DF, Leon BRTs) Strengthen traffic management (road safety, congestion pricing.)			Assign more responsibility for demand management to the municipalities rather than the state.
Multiple Sectors		<p>Institutionalize multiyear budgeting based on approved financing plans and future budget ceilings.</p> <p>Streamline budgetary release procedures and synchronize with local government budget cycles.</p> <p>Increase reliance on user fees and/or state/local own revenues.</p>	<p>Rebalance PPP and credit guarantees toward underserved subsectors.</p> <p>Reduce reliance on full federal guarantees, shift to partial off-take and risk guarantees.</p>	<p>Strengthen oversight capacity of subnational government, and accountability for use of unconditional transfers.</p> <p>Establish systematic ex post impact evaluation as a basis for future funding and program revision.</p> <p>Strengthen vertical coordination in planning, financing, and regulation.</p> <p>Improve coordination among sector agencies and SHCP on financing policies, investment priorities, and budget negotiations with Congress.</p> <p>For local infrastructure, establish state revolving funds for PPPs, disbursed on performance criteria.</p> <p>Revisit BANOBRAS business model: separate retail financing role from origination and guarantees.</p>

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