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ABBREVIATIONS

CABEI	Central American Bank for Economic Integration
CAF	Andean Development Corporation
CREMA	Integrated rehabilitation and maintenance contracts
EAP5	South East Asian countries
FIRII	Fund for the Financing of Technical Cooperation for Initiatives for Regional Infrastructure Integration (Infrastructure Integration Fund)
FOMAV	Road Maintenance Fund (Nicaragua)
GDP	Gross domestic product
GNP	Gross national product
HDM-4	Highway Development and Management Model
IDB	Inter-American Development Bank
IFC	International Finance Corporation
IIRSA	Initiative for the Integration of Regional Infrastructure in South America
MFAs	Multilateral financial agencies
OECD	Organisation for Economic Co-operation and Development
OVE	Office of Evaluation and Oversight
PCR	Project completion report
PPMR	Project Performance Monitoring Report
RMF	Road maintenance fund
SEA	Strategic environmental assessment
SECOPT	Ministry of Communications, Public Works, and Transport (Honduras)
SNC	National Roads Service (Bolivia)
SOPTRAVI	Ministry of Public Works, Transport, and Housing (Honduras)
TC	Technical cooperation
WB	World Bank

INTRODUCTION

This study assesses the engagement of the Inter-American Development Bank (hereinafter the “IDB” or the “Bank”) in road infrastructure development in Latin America and the Caribbean from 1990 to 2009. It looks only at Bank support delivered for the development of **intercity roads** and **highways**, including national and departmental highways, which accounted, on average, for 79% of the Bank’s transportation lending and 69% of its loan approvals over that span. The report is organized into three chapters. Chapter I presents the evaluation **frame of reference**, highlighting the challenges that come with the road subsector’s unique features and the specific regional environment in which the Bank was providing financing and assistance. In its review of the **relevance and positioning of the Bank’s action**, Chapter II examines the main strategies and tools used to address road sector challenges. Chapter III evaluates the **effectiveness of the Bank’s engagement** in achieving the sector objectives pursued, from the perspective of case studies of the seven countries that received the bulk of Bank support (Bolivia, Brazil, Colombia, Guyana, Honduras, Nicaragua, and Peru). The Executive Summary that follows this introduction sets out the evaluation’s **conclusions and recommendations** regarding the main strategies pursued.

The road sector challenges the Bank set itself in the framework of its Ninth General Capital Increase (document AB-2764 and annexes, May 2010) are enormous. Transport infrastructure expansion is one of the stated cornerstones of its “Infrastructure for Competitiveness and Social Welfare” strategy. More specifically, the proposed results matrix calls for the Bank to scale up its involvement in intercity highway development to take in 52,000 kilometers of such main roads in 2012-2015, more than double the 22,000 kilometers that came in for Bank support in 2005-2008. With that in mind, OVE has produced this evaluation of the Bank’s engagement in highway development over a span of nearly two decades, to identify lessons and experiences on which the Bank can draw to solidify its leadership in the region’s road subsector and deliver effective support for road infrastructure development to underpin the region’s competitiveness and well-being.

EXECUTIVE SUMMARY

Early-1990s diagnostics of the state of the road infrastructure of Latin America and the Caribbean highlighted four major challenges. First, low road density meant poor connectivity within and beyond country borders. Second, the region's main roads were of poor quality, a result of low rates of paved roads and inadequate maintenance practices. Third, the road subsector institutional bases were steadily deteriorating and the planning and management tools in place were too weak to tackle the sector's problems. Lastly, the combination of skyrocketing vehicle ownership rates and poor quality roads was making road travel more dangerous. The magnitude and relative prominence of each of these challenges obviously varied from one country to another, but during the fiscal crisis of the 1980s the problems had become generalized and more acute across the region.

Over the span covered in this evaluation (1990-2009) the Bank essayed a variety of strategies to help countries remedy this state of affairs. Its work to devise intervention strategies was constrained by the particular technical and economic features of road systems. Because of the difficulty in introducing market incentives for road operations, the Bank could not, in its work in that sector, look to the kinds of models and reforms being pursued in other infrastructure networks (power, water supply, and telecommunications), which were focusing on reframing the State's role and engaging the private sector.

The Bank's transportation policy (OP-731) has remained unchanged since its 1981 adoption; it was ratified in 1994. By virtue of the policy's flexibility, the Bank has been able to adapt its activities to very diverse country-specific environments and to the changes that have unfolded in the sector over the nearly three decades the policy has been in place. The biggest policy change during the period reviewed here, which was associated with the eligibility of expenditure items (document GN-2331-5, 2004), gave the Bank greater latitude and enabled it to increasingly finance recurrent maintenance costs.

Funding for highway projects and programs made up the bulk of the Bank's transport sector support in 1990-2009, accounting for 79% of its transportation lending and 9% of overall lending. Over those years the Bank approved 118 loans (US\$14.3 billion) and 98 technical-cooperation operations (US\$62.3 million) to finance highway construction, rehabilitation, and maintenance and help revamp and strengthen road asset development and management agencies. Over 90% of the loans financed public investment in roads and highways; only 15 loans went to the private sector. The bulk of the Bank's highway lending went to seven countries (Bolivia, Brazil, Colombia, Guyana, Honduras, Nicaragua, and Peru), which received 59% of the loans and 49% of total lending for this subsector. In the other countries in the region, the Bank's engagement was sporadic and often negligible.

Viewed against the magnitude of the investment required to extend, upgrade, and maintain the region's road networks, the Bank has in most countries been a marginal provider of road finance. Consequently, strategies and programs need to be designed to maximize the Bank's value added and enhance its development effectiveness in this sector.

The development objectives pursued in the Bank-funded operations identify the main development impacts of road improvements for the region. Virtually all the operations mention competitiveness improvements, regional and national integration, and more rapid

socioeconomic development as their development objectives. However, absent any model to meaningfully correlate the project activities to the proposed development objectives and lacking appropriate indicators, the approved operations have low evaluability. Until such a model is devised and built into project designs, the development impact of work done on particular highways or highway segments cannot be ascertained, much less attributed. In these conditions the development objectives become simply statements of intent, with no possibility of gauging the development impact of the projects.

At the “purpose” level the projects’ stated objectives speak to the region’s most pressing road infrastructure challenges: expand thin road infrastructures and improve the poor road quality that is making transportation inefficient; make road maintenance less susceptible to public budget shortfalls; help build up solid, effective institutions that can insulate the sector from political changes and equip these agencies to efficiently plan and manage road assets; and bring down the region’s high road traffic accident rates. However, in many cases the lack of quantifiable or appropriate indicators, absence of baselines, and poor quality of post-project data made it difficult to measure project outcomes vis-à-vis the above-mentioned main challenges.

The focus of the Bank’s support to improve the stock and quality of major roads was the widening or extension and rehabilitation of existing roads. Public initiative and budget funds continued to be the primary source of road finance. Efforts to engage the private sector in highway management and administration were confined to a handful of countries and roads, basically the most heavily traveled highways with the greatest economic potential, which pointed up the subsector’s constraints for attracting private enterprise. New road construction projects were less frequent and clustered in a few countries that essayed private participation models, not always successfully. There is no specific information, other than the fact that many of the road infrastructure in many of the region’s countries is thin compared to other regions, to explain the low priority given to new road investments.

On the matter of assessment methodologies and preinvestment studies, overall the Bank has experienced serious constraints for economic appraisals of highway projects because it has had too few data of the right kind for reliable calculations and because road system development and improvement externalities are difficult to identify. The Bank has done more work on adapting social and environmental impact assessment methodologies, and has contributed some project impact studies and helped build up competencies in road agencies. Lastly, the Bank has made a significant contribution both on the preinvestment finance side, by way of its Infrastructure Integration Fund (FIRII) and InfraFund, and to advance the regional infrastructure integration agenda through the spaces opened up by the Initiative for the Integration of South American Regional Infrastructure (IIRSA) and the Mesoamerica Project.

The implementation issues reported in Bank-funded highway projects, which created cost overruns and major delays, were more or less similar across all countries. The most frequently reported problems are missing or incomplete preinvestment studies, weak executing agencies, and flawed procurement processes for the selection and contracting of construction or maintenance firms. The latter problem was more acute in the smaller economies with their smaller construction contractor pools. A final frequently cited cause of

setbacks was the lack of timely availability of counterpart funds during the fiscal crunches some of the countries experienced.

The Bank delivered substantial support to countries to reduce road sector vulnerability to exogenous factors like political changes, budget cycles, and environmental factors, particularly those associated with natural disasters. Support for creation of dedicated road maintenance funds, institution-strengthening and development of planning and management capacity and tools, and design of risk management tools were facets of the strategies pursued. The gains achieved, though considerable, speak to the difficulties that stem from the road subsector's particular political economy and the complexity of institutional change processes.

Efforts supported by the Bank to ensure continuing road quality have had mixed results: although definite improvements have been achieved in road asset quality, there are sustainability weaknesses. On the positive side, a road maintenance culture has been steadily instilled, technical competencies for maintenance have been built up in some countries, and force-account roadwork and road administration has been replaced by an array of private-sector contract formats. But the creation of road maintenance funds (RMFs) and organizations technically and physically equipped to operate them has done little to reduce the sector's fiscal and political vulnerabilities. Securing approval of RMFs was an arduous task, requiring time and political will. In some instances the process was very protracted; in others it was stopped. In countries that did set up RMFs, after an initial period of progress and improvements in the quality of road assets, these facilities came under political and administrative pressures, with ensuing cuts in monies ultimately transferred to the Funds, expenditures on road activities other than maintenance, and institutional strategy changes that have limited the initial gains.

In recent years the Bank has been including more funding for maintenance in the highway projects it finances, to be performed via a variety of contracting formats ranging from unit price and quantity contracts to the more novel specified-performance models. This strategy allows it to ensure the medium-term quality of the roads rehabilitated and maintained, shielding them from fiscal and political pressures and developing and entrenching a better maintenance culture. But this model, too, faces serious sustainability challenges for the long run, to the extent that work that is by nature routine is reliant on external funds.

The evaluation found that while the Bank did deliver continuing and considerable support to build up institutional capacity in the subsector—a component of most of the operations it funded—overall that support did not fix institutional weaknesses. The best results were obtained in countries with the most solid road sector institutions; in countries where that institutional base was weakest, the competency-building and professionalization gains achieved were erased owing to frequent changes of authorities and high staff turnover. In the absence of adequate data and of incentives for efficient road asset planning and management, the Bank's support could not be effectively availed. In some countries the sector reforms of the 1990s, notably decentralization and private-sector engagement, overwhelmed road agencies' technical and regulatory capacity and triggered erratic, costly processes.

Until very recently the Bank's activities to address road assets' vulnerability to natural disasters focused on providing access to emergency funding to remedy the situation such shocks create. Over the course of the evaluation period, the Bank approved a total of 20 emergency loans, each with a sizable road component. In 2007 it began developing disaster prevention instruments, and in 2009 it approved the Integrated Disaster Risk Management Approach under which funding will be made available to countries to deal with reconstruction needs in the wake of natural catastrophes.

Lastly, given the magnitude of the safety problems affecting the region's roads, the actions were timid and concentrated in operations approved in the past several years, which included some technical measures to try to remedy those problems. The Bank recently unveiled a comprehensive action plan to improve road safety that addresses this concern from a cross-sectoral perspective and will engage all key road-safety stakeholders, the goal being to halve the number of road accident fatalities in the region in the next decade.

Recommendations

The following are the recommendations of this evaluation to make the Bank's highway lending more evaluable, relevant, and effective, in response to one of the prime mandates of the Ninth General Capital Increase:

- a. Update the Bank's road sector policy and produce action guidelines that are informed by the Bank's accumulated experience, take a comprehensive view of the road subsector, serve to identify and recognize its diverse objectives (market access and transport logistics, adding to road assets, spatial integration and extension) and select the best action instruments. This includes identifying intervention models fitted to country-specific challenges and realities and maximizing the Bank's value added.
- b. Scale up analytic work to deepen sector knowledge and advance creative ways of addressing the following issues:
 - (i) the road subsector's political economy and vulnerabilities, particularly political and fiscal impacts on highway investment and maintenance;
 - (ii) the limits and potential of private participation;
 - (iii) the construction and maintenance contractor market and its impacts on bid processes, costing, and delivery times;
 - (iv) the value added to project efficiency by Bank policies and requirements.
- c. Increase the value added and quality of preinvestment studies and improve project evaluability. This will mean improving the quality and reliability of the statistical base and of national investment systems, country-tailoring economic and socioenvironmental assessment methodologies, internalizing risks associated with road subsector vulnerabilities, and identifying results indicators with verifiable baselines and targets. This will improve project

design, minimize fiduciary and cost overrun risks, and provide for timely supervision to verify effectiveness.

- d. In light of the road subsector's political and fiscal vulnerabilities, the Bank's engagement should be sustained over time, maintaining a sector perspective and a long-term country presence. In particular, the recommendation is to consolidate institutional change processes through ongoing dialogue with line ministries, provide more opportunities for technical capacity building and sharing for those agencies, and sustain and deepen the policy dialogue with finance ministers.
- e. In consideration of the environmental vulnerabilities and to address the challenges of climate change and natural disasters, the Bank recently adopted the Integrated Disaster Risk Management Approach, which should make for more effective emergency responses. As an adjunct the Bank should pursue strategies to make road assets more resilient. The development and adaptation of road construction, rehabilitation, and maintenance standards and technologies is a key facet of such strategies.
- f. To help the region improve road safety, the Bank needs to develop and promote vehicles that can effectively address the magnitude of the problem. The proposals that came out of the Road Safety Initiative (Cancún, 2010) should be implemented in the near term to make sure that operations are evaluable and effectively monitored to deliver country-tailored support.

I. FRAME OF REFERENCE

1.1 The Bank has had a leadership role in the region's road subsector throughout the close to 20 years covered in this evaluation. Its overarching strategy has been to work with countries to build solid networks of highways and secondary and rural roads that are sufficiently integrated to move freight and people efficiently.¹ Up until the early 1980s the region was making impressive strides on this front, but the fiscal crisis of the following years and the institutional strategy subsequently pursued led to a deterioration in the region's road systems and road planning and management agencies that has only begun reversing in the last few years. The outlook today is mixed. The quality of major roads has improved, road agencies have become more professional, and both their importance and their failings are now better understood, but only a handful of countries have managed to reduce their road assets' characteristic vulnerabilities. In this first chapter we set out the frame of reference for positioning the Bank's road sector activity, including the main sector challenges and the conditions that determine the potential scope for Bank engagement.

A. The road subsector in Latin America and the Caribbean

1. The state of the region's road systems²

1.2 By 1990 Latin America and the Caribbean had lost its decades-long slight edge over the South East Asian countries (EAP5) in total road length, and the gap only widened during the period examined here (Figure 1, Annex I).³ On average the region's road infrastructure stock remained virtually unchanged at 0.17 kilometers per square kilometer whereas road stocks tripled in the EAP5 and increased close to 40% in the industrialized countries (Table 1, Annex I). Road quality—measured as the percentage of paved road—improved somewhat, from 22% to 29% of total road networks, but these averages mask considerable cross-country disparities that have to do with differences in size and spatial occupation patterns. Nevertheless, the improvements were felt regionwide, and in some countries (Bolivia, Colombia, Guatemala, Peru) the gains were considerable.⁴ The percentage of paved main roads topped 80% in the smaller countries like Barbados and Uruguay but was barely 20% in countries such as Chile, Ecuador, Colombia, and Brazil (Figure 3, Annex I).⁵

1.3 Maintenance funding shortfalls were a constant during the review period. As a result of unstable and inadequate resource allocations for maintenance, the region's roads remain in poor condition. Even with the quality improvements many countries have achieved in the past decade, between 40% and 50% of the region's roads are in a fair or poor state of repair. According to the most recent available data, there have been substantial, albeit unsustained, improvements in the state of paved roads in Central America (except Costa Rica), where 40% to 65% of roads were in good condition in 2007. In South America there is no uniform trend: Chile's roads are in good repair and Peru's are steadily improving; advances in some countries, such as Argentina and Colombia, have been inconstant; and in Bolivia it has proved difficult to remedy the poor road quality that has been the norm (Figures 6 and 7, Annex I).

- 1.4 One trend common to most of the region's countries over the review period was the separation of policy and regulatory functions from those of works execution. Road asset policy, regulation, and management was consolidated in specialized government agencies, whereas the road maintenance function that traditionally had been performed on a force-account basis was contracted out to the private sector using a variety of formulas including unit price and specified-performance contracts and microenterprises. Road hierarchies were devised, authority and responsibilities were apportioned across different levels of government, and private firms were brought into highway management, construction, and maintenance. The results of this shift varied from one country to another, having proved more successful in countries like Brazil, Chile, Colombia, and Peru than in countries with more fragile institutional environments and greater restrictions in the road construction and maintenance contractor markets.
- 1.5 Soaring vehicle ownership rates with no commensurate road system expansion and upgrades, including road safety improvement measures and investments, have driven up accident numbers and rates on the region's roads. Vehicle traffic in the region skyrocketed in the period examined here (Table 2, Annex I). On average the number of vehicles per 1,000 people jumped more than 40%. This increase was regionwide, the highest growth rates having occurred in Mexico (150%), Venezuela (52%), and Ecuador (42%). The reported road accident mortality rates of some Latin American countries, notably Argentina, El Salvador, and Mexico, were among the highest in the world (Table 3, Annex I).⁶ In 2000 the region led the world in traffic accident fatality rates per capita (close to 122,000 lives lost each year and between 20 and 50 serious injuries for each fatality).^{7,8}
- 1.6 As a corollary, perceptions of road quality are much worse in the region than in OECD countries and parts of Asia (Figure 5, Annex I).⁹ For Latin America and the Caribbean, the rating reflecting this perception averages 3.2 points, well below the OECD countries' 5 points and 5.5 in the EAP5. Here, again, there are marked cross-country differences within the region. Quality perception ratings are highest in Chile, El Salvador, Uruguay, and Guatemala, whereas ratings in the major economies like Brazil, Colombia, Peru, Argentina, and Venezuela are below the regional mean. One finding that stands out is that quality perception ratings in Paraguay and Bolivia are near the bottom of the list of 134 countries surveyed.
- 1.7 The literature suggests that insufficient road infrastructures and poor quality roads are impacting competitiveness and reinforcing poverty patterns in some parts of the region. On the competitiveness side the deficiencies mean high transport and inventory costs, which have taken the region's logistics costs to triple the levels in the United States, OECD countries, and Singapore.^{10,11} Moreover, because of the region's low road density, some vast geographic areas are not linked or integrated into national economies and societies, creating zones of exclusion where there is little State presence in production and trade. Lastly, the region's thin road networks are reinforcing poverty patterns, inasmuch as they leave close to half its rural

population with difficult, if any, access to formal markets and social services, fueling migration to the cities and increasing urban poverty and informalization.¹²

2. Road infrastructure financing

- 1.8 Road investments in Latin America and the Caribbean during the evaluation period were too low to fill in the gaps in existing road stocks, restore and upgrade service levels, or even guarantee that existing road assets would be maintained.¹³ Public investment in roads in the 1990s came to 0.35% of GDP, virtually unchanged from the 1980s rate of 0.30%. Though public investment picked up again from 2000 onward it still is far below the 1.5% of GDP that is viewed as the average required to restore service levels and close the existing gaps (Figure 11, Annex I).¹⁴ Here, too, there were substantial differences across the region. Public investment climbed steadily in Guatemala, Argentina, Brazil, and Colombia but continued to trend downwards in others including El Salvador, Honduras, Peru, and Uruguay (Figure 12, Annex I).
- 1.9 In the early 1990s the region began exploring different formulas to engage the private sector in road finance and management. Such private involvement as was ultimately achieved was confined to a few countries and discrete sections of highway and was erratic in most of the countries. By 2004 close to 250 road concessions were operating in Latin America, taking in roughly 36,000 kilometers of highways and clustered in a handful of countries (Figure 13, Annex I).¹⁵ Roads in Argentina, Brazil, Chile, Colombia, Mexico, and Uruguay constituted 85% of the kilometers under private operation. Even in countries that had been most successful in attracting private enterprise, the kilometers under concession were still a small proportion of total road length.¹⁶ Across the period examined here, private investment consistently trailed public investment regionwide, at a significant distance from 2003 onward. That trend has held in recent years, with public investment in roads outstripping private investment by a factor of four in 2007.
- 1.10 There are several kinds of constraints for private participation in highway finance and management. The first are structural, associated with the limited opportunities for commercial operation of roads or road subnetworks. For road network design reasons, very few of the region's roads are candidates for toll collection and these would have to carry at least 1,500 vehicles a day just to recoup toll collection costs. Considering also the desire to recover at least a portion of road maintenance costs, only 2% to 3% (by length) of the region's intercity highways and 20% to 25% of paved roads are feasible toll candidates without subsidies.¹⁷ At the present juncture, private participation prospects are tightly confined to particular highways or highway sections and to high-traffic countries.
- 1.11 On the contractual and regulatory side, issues involving traffic estimates, costs, and adequate toll tariffs have prompted frequent contract renegotiations. Difficulties in controlling such issues as contractual opportunism and building construction market price fluctuations into concession tenders are but two of the constraints for these ventures. The need to supplement toll revenues with direct government supports to

meet daily minimum traffic guarantees has in many instances created heavy debts to concessionaires and compromised future public budgets. Lastly, there have been problems in adapting contracts quickly in fragile fiscal and institutional environments, and some contracts ultimately were canceled.¹⁸

- 1.12 The limited funding allotments for road asset expansions and maintenance are a direct consequence of the political economy of this subsector that puts it at a disadvantage to others—even other infrastructures—when governments are apportioning budget monies. To preserve the engineering properties of roads and lengthen their service life, they need to be maintained before signs of pavement distress appear, or the roads will have to be rehabilitated. So long as maintenance is deferred, the costs associated with poor road quality are borne by individual carriers, who pass them on to the domestic economy through a process whose impact is not readily appreciable. Ultimately, when roads have deteriorated to a certain point, it is more economic and practical to rehabilitate them.

3. Road subsector vulnerabilities

- 1.13 The technical characteristics of road assets and the difficulty in building market incentives into road operations present unique difficulties for this subsector that leave it more vulnerable than other infrastructures to economic, political, and environmental pressures and impacts. Because the sector is so vulnerable, the gains it does manage to achieve often are short-lived, and it goes through repeated cycles of road rehabilitation, quality upgrades, fiscal or political crisis/natural disaster, and gains erased, only to start the cycle anew.
- 1.14 **Fiscal vulnerability.** The fact that roads are public goods coupled with structural constraints for own revenue generation from sales of services and the road subsector's distinct political economy make it heavily reliant on government budget transfers. The adequacy of traditional budget appropriations for the subsector thus depends on the public funds available. Changes in the national accounts have a magnified effect on the availability of those resources. Indeed, the contraction in infrastructure investment in 1980-1995, a major piece of the fiscal adjustment process, continued and became more acute even after the fiscal crunch had passed.¹⁹ By the same token, during the recent fiscal expansion period of the 2000s, GDP increases brought with them more than proportional increases in funding allocations to the road subsector, though still not high enough to make up existing shortfalls.
- 1.15 **Political vulnerability.** The second type of road sector risk is the interjection of short-term political goals to the detriment of the pursuit of sustainable, efficient investments for the long term. Though other infrastructures share this susceptibility, it is more serious for the road sector because it is so heavily reliant on public funding and requires repeated political approvals, and because difficulties in producing technical and economic assessments limit the decision scope. The subsector thus has to contend with recurring shifts in priorities, administrative corruption, staff turnover, and decisions made for short-term political gain.

- 1.16 **Natural disaster vulnerability.** As the number of natural disasters has soared in developing countries in recent decades, so too has their economic and social toll. Natural calamities cause severe macroeconomic impacts in the region's countries and their infrastructures are frequently damaged by events of varying magnitudes. Each year the region's infrastructure sustains many millions of dollars in direct, indirect, and secondary losses (including higher transportation costs) from floods, landslides, earthquakes, and other natural events. This impact is magnified as a result of deficient road design and construction standards, technical deficiencies in road siting, and the lack of adequate protective structures. The absence of disaster prevention and mitigation plans and inadequate natural resources management and land use planning accentuate this vulnerability.

B. The Bank's transportation sector policy

- 1.17 The policy that guides the Bank's transport sector work (OP-731) is reflective of the difficulty of designing policy approaches to address road sector institution issues and come up with specific recommendations on the strategy to pursue, which the Bank did do in its policy for other network infrastructures. In contrast to OP-708 (Public Utilities Policy) applying to the other infrastructures, which was revised following the Bank's Eighth Replenishment (1994), policy OP-731 that dated back to 1981 was ratified without change following the Eighth Replenishment. Policy OP-731 proposes that the Bank's strategy focus on strengthening of sector institutions and on maintenance and conservation of existing road infrastructure. In the latter regard the policy states that all Bank loan contracts for roads projects are to contain standard clauses requiring maintenance for at least 10 years. Furthermore, without precluding Bank support for new infrastructure development, the policy suggests that such contributions might be largely catalytic in nature, given the Bank's limited resource availability and the magnitude of the investment these kinds of projects require.
- 1.18 To supplement this sector policy, in 1982 the Bank adopted an Operating Policy for Maintenance and Conservation of Physical Works and Equipment (GP-105) which remains in force, its aim being to encourage the member countries to maintain and conserve their physical assets. This policy dictates that "the Bank shall not finance routine maintenance operations [...] The Bank will finance periodic maintenance" It further states that the Bank will emphasize the creation or improvement of road conservation and maintenance institutions, including specialized agencies in this field, planning, quality standard setting, and associated engineering and methodology matters. The Bank's Policy on Involuntary Resettlement (OP-710) adopted in 1998 and the Environmental Safeguards approved in 2006 (document GN-2208) are considered supplements to its sector policies given the nature of transport operations and their environmental and social impacts.
- 1.19 During the period examined here, the Bank scaled up its support for routine road maintenance and has been increasing financing for that work since the adoption of its new policy on eligibility of expenditures for Bank financing (document GN-2331-5) in November 2004. That policy removes restrictions on the use of

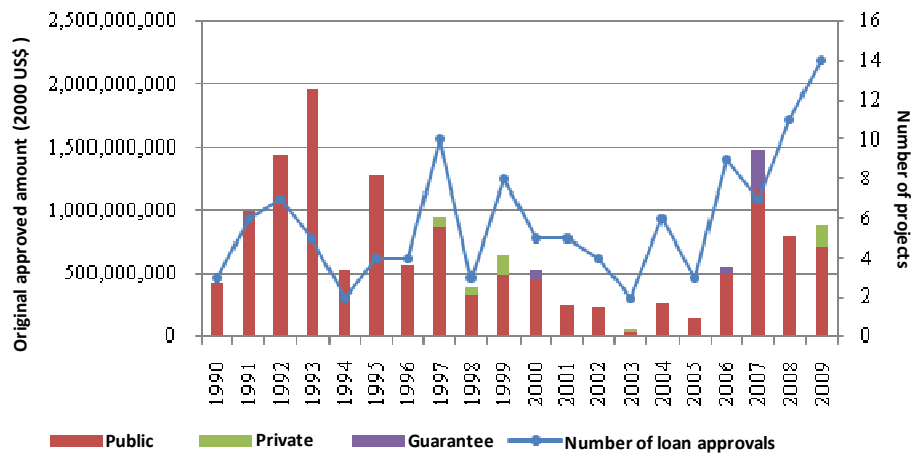
Bank loan funds for recurrent expenditures, thereby opening the door to finance routine road maintenance.²⁰

II. RELEVANCE, POSITIONING, AND EFFICIENCY OF BANK ACTIVITY IN THE ROAD SECTOR

- 2.1 From 1961 through 2009 the Bank approved 352 transportation loans totaling US\$29.84 billion, which made up 11.86% of its total lending.²¹ Roughly half (170) of these loans (US\$18.469 billion) were approved during the period covered by this evaluation (1990-2009). Intercity highway projects and programs accounted for 69% of the Bank's transportation loans over that interval, with 118 approvals totaling US\$14.338 billion (79% of lending by volume).²² Until very recently, major highway and rural road finance was the core focus of the Bank's transport sector activities (Figure 1, Annex II), but two factors limited its relevance in addressing the region's highway needs. First, the Bank's lending was modest relative to the subsector's requirements and also relative to countries' budget expenditure for major roads. Second, Bank-funded operations were clustered in a handful of countries, with only sporadic and marginal involvement in the large majority of countries.
- 2.2 The Bank focused its support on the most pressing road sector challenges and accurately identified the development impacts of the countries' deficient road networks. Most of its operations were aimed at remedying deficiencies in the region's highway infrastructure and helping countries reduce the fiscal and political vulnerabilities of their road assets. An array of country-tailored strategies and vehicles were deployed over the period reviewed here. The Bank also worked to adapt its products and devise new ones to address the environmental vulnerabilities of road systems and mitigate road transport impacts.
- A. The Bank's road sector portfolio during the review period**
- 2.3 Over the period examined here, the Bank approved 118 loans and 98 technical-cooperation operations (TCs) for intercity highway projects, totaling US\$14.338 billion and US\$62.3 million, respectively (Tables 1 and 2, Annex II).²³ Approvals by volume and number of operations were particularly high between 1991 and 1997, and then fell off sharply for some time. Highway project approvals picked up again in 2006 with an increase in project numbers, albeit in smaller amounts: the 2006-2009 average project approval of US\$90.6 million was less than half the US\$203.2 million 1991-1997 average. The 14 new loans for this subsector in 2009 (US\$879.8 million) marked a high for approvals in the review period, and included three private-sector operations (Figure 1).
- 2.4 The Bank's 1990-2009 loan and TC approvals were heavily concentrated in a handful of countries in the region. Brazil and Argentina accounted for most approvals by funding volume (27.9% and 14.7%, respectively) (Figure 3, Annex II).²⁴ Brazil also received the largest number of loans (24 operations, 20.3% of the total), while Argentina received only five. The other countries that came in for

substantial support in terms of numbers of approvals were Honduras with nine operations, Bolivia, Colombia, and Peru with eight loans each, Nicaragua with seven, and Guyana and Jamaica each with six approvals. At the other extreme are Barbados, Costa Rica, Mexico, Suriname, Trinidad and Tobago, and Venezuela with a single loan each across the entire evaluation period (Figure 4, Annex II). TCs likewise were clustered in a few countries. Bolivia received 15% of the volume of TC approvals over US\$150,000 (US\$9.2 million for 12 projects), followed by Guyana with 7% (US\$4.6 million, 7 projects). The Bank also approved 10 regional TCs totaling US\$4.8 million (Figure 10, Annex II).

Figure 1. IDB highway lending, 1990-2009



Source: From OVE/OVEDA.

2.5 By virtue of its support to the seven countries—Bolivia, Brazil, Colombia, Guyana, Honduras, Nicaragua, and Peru—that accounted for the bulk of approvals in the evaluation period the Bank became a leading partner on the funding side as well as in the sectoral technical dialogue for ongoing highway project approvals and monitoring. Those countries together received 59% of total loans (48% of total lending by volume) and 41% of TC operations (44% of the TC funding total). A comparison of Bank approvals per kilometer of paved road and per capita (Table 1) illustrates the magnitude of the Bank’s support, by those two yardsticks, to Guyana, Honduras, Nicaragua, Bolivia, and Peru, which in relative terms surpassed the numbers for the larger economies like Brazil and Colombia that came in for a heavier share of approvals generally.²⁵

Table 1
Intensity of IDB intercity highway financing (1990-2009)

	Number of loans	Number of TCs	Total approvals (2000 US\$)	Total approvals per km of paved road (2000 US\$/km)	Total approvals per capita (2000 US\$ per capita)
Bolivia	8	12	459,174,497.61	99,820.54	35.00
Brazil	24	7	4,002,473,877.13	33,559.78	21.21
Colombia	8	5	558,371,554.52	45,161.08	12.26
Guyana	6	7	162,101,759.36	324,203.52	229.88
Honduras	9	5	465,102,220.14	193,792.59	63.24
Nicaragua	7	-	261,581,362.66	107,249.43	49.83
Peru	8	4	1,050,030,550.56	97,414.47	37.01

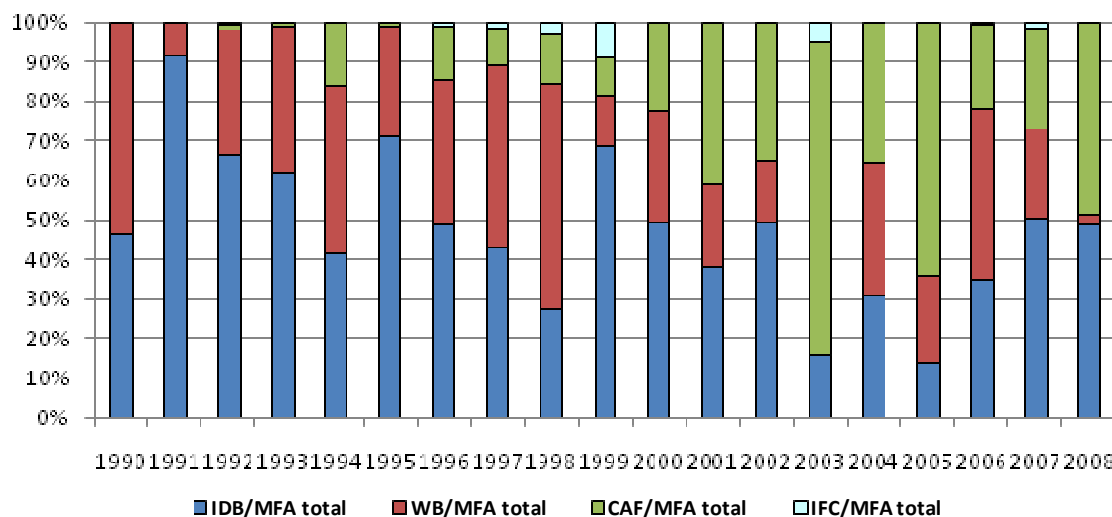
Source: OVE/OVEDA, WDI-IRF data.

2.6 Up until 2008 there was less private-sector engagement in the Bank's road sector activities than in its work with other infrastructures. Previously the bulk of its road lending had been to the public sector, with only nine private-sector loans (US\$313 million) approved for highway construction, extension, and long-term maintenance. In 2009, following a decade that saw a single private-sector loan approval (PE-0235 in 2003, US\$16.9 million), the Bank approved three loans totaling US\$172 million. Three of the 12 loans approved during the review period were canceled (17.6% of total approvals by volume), which left the Bank with five operations in Brazil and one each in Peru, Uruguay, the Dominican Republic, and Jamaica. Three guarantees totaling US\$471 million were approved over that same period, in Chile, Panama, and Mexico.

B. Bank activity in the context of multilateral financing

2.7 Throughout the 1990s the IDB and World Bank were the largest lenders for sector operations in the region, with the IDB having had a clear leadership role. The Andean Development Corporation (CAF) was just beginning to make its presence felt.²⁶ Two parallel processes were in evidence from 2000 onward. On one side, the World Bank's share in the region's road lending declined to nil by 2003, and IDB lending also dropped off sharply. These were years in which both the World Bank and the IDB were advocating a move from public to private infrastructure investment, albeit less so for roads than for other infrastructures. Meanwhile, the CAF boosted its regional presence to position itself at the fore and by 2003 was supplying 79% of total road finance to the region. Subsequently the transport finance market began to recover, and the IDB appeared poised to regain its former lead lender role (Figure 2).²⁷

Figure 2. MFA shares in intercity highway lending



Source: OVE/OVEDA, World Bank website and CAF data.

2.8 The IDB delivered close to half (43%) of all MFA transportation lending to the region during the review period. It also had the largest road lending share (85% of its approvals by funding volume were for intercity highways), whereas the CAF, its chief competitor in the region, had a more diversified portfolio with a heavy emphasis on urban transport. An overwhelming share of highway construction, rehabilitation, and maintenance was government funded, with the space for private finance being limited and confined mostly to ports and airports (with 35% and 31% shares, respectively)—a mark of the appeal of those kinds of ventures to private investors.

C. Objectives and relevance of Bank activity in the road subsector

1. Development objectives²⁸

2.9 In its road subsector work, the Bank identified—accurately, according to the literature—the main development impacts of the region’s deficient road systems, when it included competitiveness improvements, national and cross-border integration, and socioeconomic development as the prime stated development objectives of the operations it approved. Competitiveness enhancement figures as a development objective in 33% of projects; furthering national and regional integration is mentioned in 36.5% of operations, and in 22% the socioeconomic development objectives being pursued envisaged infrastructure improvements to enhance access to social services, among other aims.²⁹ The frequency with which each of these appeared as a project objective is roughly the same in all countries, regardless of their geographical location or road infrastructure endowments, and

remained virtually unchanged across the close to two decades examined for this evaluation.

- 2.10 The road project loan documents did not provide indicators with which to measure the operations' impact against their stated development objectives, nor did they specify conditions and constraints under which such impacts would be achieved or quantify the benefits of project activities. Until work on specific highways or road sections can be meaningfully correlated to the proposed development objectives, the latter will continue to be declarative, enabling no ex ante analysis or ranking of projects by anticipated development impact, or post-project contribution assessments.³⁰

2. Specific or purpose-level objectives

- 2.11 The stated specific objectives of highway projects approved during the period examined here speak to the region's most pressing road infrastructure challenges: scale up weak road infrastructures and improve the poor road quality that is making transportation inefficient; make road maintenance operations less vulnerable to fluctuations in the public finances; help build up solid, effective institutions that can insulate the sector from political changes and equip these agencies to efficiently plan and manage road assets; and bring down the region's high road traffic accident rates.
- 2.12 The most frequently appearing measures of transport efficiency improvements were reductions in personal and freight travel times and costs. Of the 104 investment loans approved for intercity highways in 1990-2008, 68 included both those impact indicators and 95 included at least one of them. These indicators' evaluation usefulness was limited by the absence of an explicit baseline in most of the projects.³¹ Furthermore, ex post measurements had been obtained for less than half the 51 completed projects for which a project completion report (PCR) had been produced.
- 2.13 The performance of two other specific objectives—road maintenance sustainability and institution-strengthening—is even less evaluable because for the most part no monitoring indicators are specified or the selected indicator cannot be used to measure the objective's intrinsic dynamic. Specifically in this latter case, the indicator cited in the majority of projects as a road maintenance sustainability measure is “percentage of the road network in good condition”—an indicator that can give only a snapshot depiction of road quality at a particular moment in time, which is far from a measure of the sustainability potential of the project or work performed. As for institution-strengthening objectives, the array of baseline situations and absence of appropriate measurable indicators and a baseline for the Bank's activities is a further evaluability constraint. With regard to road safety objectives, the safety improvement indicators provided in 44 of the 104 loan documents were more standardized and readily quantifiable, and many of the PCRs did supply data on changes in highway accident, injury, or fatality rates.

D. The Bank's positioning to help address sector challenges

2.14 To address the challenges reflected in its highway projects' specific objectives, the Bank adopted flexible action strategies, essaying a variety of intervention models tailored to specific needs and differences between countries and becoming a key player in this subsector. Overall, the Bank targeted much more of its support to the rehabilitation and maintenance of existing highways than to the expansion and construction of new roads; it promoted systems and practices to improve maintenance efficiency and sustainability, including the promotion and installation of load, weight, and size compliance checkpoints; and it helped strengthen road asset planning, regulatory, and management agencies and institutions. In the later years of the evaluation period, the Bank stepped up the frequency of actions intended to address the region's very serious road safety problem.

1. Enlarging road stocks and improving road quality

2.15 Most of the Bank's road lending in 1990-2009 was for physical rehabilitation work (87 of 118 project approvals), and the vast majority of operations were aimed at restoring roads to their original condition. Thin road infrastructures and the need to expand them were not the focus of Bank action over that period. And, other than the fact that Latin America and the Caribbean has a smaller road infrastructure endowment than other regions and countries, there is insufficient information to have made a case for road asset expansions under the current institutional framework. The Bank provided relatively little funding for new road construction and explored highway financing and management models involving private operators, most notably in ventures in Chile, Mexico, Peru, Colombia, and Brazil and, unsuccessfully, in Honduras and Bolivia.³²

2.16 As vehicles to scale up the region's highway infrastructure and bolster regional integration activities, the Bank supported the creation of two initiatives specifically designed to spur integration infrastructure planning and development: the Initiative for Integration of Regional Infrastructure in South America (IIRSA) for the South American region and the Mesoamerica Project, formerly called the Puebla-Panama Plan, that takes in the Central American countries and Mexico. The core objective of both initiatives is to create spaces for engaging in dialogue and seeking common ground, in order to come to consensus decisions on investments and other activities needed to propel regional integration infrastructure development. The transport sector, and highway networks in particular, figure prominently in the two initiatives, both on the financing side and for consensus building around the idea of integration corridors that countries have individually sought to finance.³³ Twelve of the Bank's intercity highway loans in the 1990-2009 period examined here were approved under the IIRSA and nine under the Mesoamerica Project.

2. Reducing fiscal vulnerability

2.17 The second major challenge addressed in the Bank's highway operations was the lack of timely road asset maintenance, a result of this sector's high vulnerability to budget fluctuations. Accordingly, the Bank included in its loans and TCs activities

to help instill a sustainable maintenance culture, anchored in institutions with the financial means and technical capabilities to ensure that roads are properly maintained. Activities explored to that end were the creation of dedicated road maintenance funds, various formulas for private-sector engagement in road maintenance, and the creation of technical agencies equipped to efficiently manage road asset maintenance.

- 2.18 The Bank partnered with most of the other multilateral financing agencies (MFAs) and bilateral agencies to promote and establish road maintenance funds (RMFs), virtually all of them funded through motor fuel taxes and earmarked for road maintenance, which in reality could be considered a type of “shadow toll” for road use. An RMF component figured in 16 projects during the evaluation period, most of them loans approved in the past decade, with the exception of one 1995 Guatemala loan (Table 1, Annex III). The largest amounts of Bank funding for RMFs went to Nicaragua, Guatemala, Jamaica, Honduras, and Haiti, with smaller supports to Bolivia and Peru (Figure 1, Annex III). Creating an RMF proved to be a slow, complicated exercise in virtually all the countries given the difficulty of achieving political agreements to give road maintenance priority over other expenditure—primarily social spending—and a curtailing of budget discretionality begrudged by the executive branch. The process went much more quickly in Guatemala than in Honduras. Following protracted discussions an RMF was set up in Nicaragua but never became operational. Despite much effort an RMF for Panama has yet to move beyond the discussion stage (see Annex III).
- 2.19 One last trend in road maintenance management in virtually all countries during the review period was the move from force-account to privately contracted road maintenance. The Bank actively advocated this approach and played a decisive role in that effort in the Central American countries, Haiti, Guyana, the Dominican Republic, and Jamaica. An array of contracting formats were essayed to replace the force-account system, ranging from quantity and unit price based models to the more novel medium-term specified-performance contracts with private firms. The degree of private participation varied as well, from simple unit price contracts to integrated rehabilitation and maintenance contracts (known as the “CREMA” system, from their Spanish name) that increase the private operator’s autonomy and share of responsibility over a longer term, with full or partial cost recovery via toll revenues.³⁴

3. Reducing political vulnerability

- 2.20 One of the strategies that came in for most frequent Bank support was the pursuit of a more efficient, autonomous institutional model or arrangement for the road sector. The aim was to reduce road sector operations’ susceptibility to “political interventionism” and the ensuing loss of technical expertise and decision-making failures in the sector, and ultimately efficiency losses. To that end the Bank helped devise and pursue changes in the road sector institutional base and funded activities to build up capacity in road asset planning and regulatory agencies and equip them

with technical and methodology tools for more efficient and effective decision-making.

- 2.21 The most frequent focus of Bank support for institution-strengthening in the 1990-2008 period was the buildup of road sector planning and regulatory capacity at the national level (in 70% of loans, with a slight uptrend in annual approvals of projects containing such a component)³⁵ and in subnational agencies with those same mandates (in 19% of loans). In particular, the Bank assisted in the creation and strengthening of specialized organizations in charge of RMFs (COVIAL in Guatemala, FOMAV in Nicaragua); these organizations, which have a measure of autonomy, plan, supervise, and administer road maintenance operations. They have been given responsibility for developing Programmed Maintenance Plans, instituting monitoring models and Geographic Information Systems (GIS) to track the state of roads, professionalizing and building the technical skills of personnel tasked with that work, and promoting associated periodic accountability reporting. Those types of activities were most likely to figure in Bank projects (as part of an institutional strengthening package) in countries where the above-mentioned RMFs had been developed.
- 2.22 The Bank also helped build up road authorities' capacity to assess and monitor the environmental impact of road and highway development. According to the analysis findings, 17 of the 104 loans approved in 1990-2008 contained components to fund environmental management capacity strengthening in the environment ministry or the transport sector authority's environmental impact management unit.

4. Reducing environmental vulnerability

- 2.23 Until very recently the Bank's only effective avenue to mitigate the often devastating impacts of natural disasters on road infrastructures was emergency lending to help countries manage the aftermath of such catastrophes. Over the period examined here the Bank approved 20 emergency loans totaling US\$870.3 million, three of them (US\$41.8 million, 4.8% of the total) specifically for road infrastructure repairs or rebuilds; 38.7% of the other lending went to the road subsector, mostly via components to rebuild highways and bridges.
- 2.24 During the review period, the Bank adopted a number of products and policies to help the region with disaster prevention and preparedness. Its new Disaster Risk Management Policy (document GN-2354-5) approved in 2007 superseded the previous Policy for Natural and Unexpected Disasters (OP-704). Over that same interval, several grant facilities for disaster prevention were approved, among them the Disaster Prevention Fund and the Multidonor Trust Fund for Disaster Prevention and Risk Management. In 2009 the Bank developed new financing vehicles as part of the Integrated Disaster Risk Management Approach to help improve long-run fiscal planning and management of the costs of natural disasters. An effectiveness assessment will be done later of these still early-stage vehicles.

5. Making roads safer

- 2.25 Despite the region's very high road accident rates, relatively few of the Bank's loans addressed that concern, and most were approved in the last five years of the review period. The Bank included activities directly aimed at improving road safety in 24 loans, over half of them (13) approved between 2002 and 2009. Rather than taking a comprehensive approach to the issue of road safety, these operations for the most part funded piecemeal measures to build protective structures, signage, and signals and pay for equipment upgrades for traffic regulation and compliance authorities. The Bank's private-sector operations were the first to include funding for road safety improvements and tighter compliance monitoring and supervision of associated variables. The projects with Brazil, in particular, helped bring in highway assistance technologies using Traffic Operations Centers along the road network, coupled with better lighting and other traffic safety improvements.³⁶
- 2.26 The Bank's support during the evaluation period to make the region's roads safer was modest relative to the magnitude of accident tolls. To address this challenge it has recently (2009-10) developed a road safety initiative with the goal of halving road accident fatalities in the region over the next decade. Its areas of focus include building road safety components into all transportation projects approved by the Bank and securing sustainable financing for road safety measures; maintaining ongoing country policy dialogues that engage government authorities, civil society, and the private sector; working with governments to improve national road safety policies; and improving road quality.

E. Methodology constraints and contributions

- 2.27 The relevance of the Bank's highway development support and its value-adding potential are closely associated to the technical value added in project preparation, the quality of assessment methodologies used, and the tailorability of Bank loan products available to the region.
- 2.28 For its operations to be relevant and evaluable, the Bank must be able to add value at the preinvestment stage. The new project cycle approach (CS-3734) calls for shorter project preparation times to improve Bank efficiency. Since highway investment projects are complex and typically have long lead times, the quality of investments to be funded will be determined largely by the quality of in-country analysis, hence the need to improve national road-asset investment systems. The Infrastructure Integration Fund (FIRII) and InfraFund, and the tapping of those facilities early on, are fundamental to produce ready projects that can meet the new project cycle timelines.
- 2.29 On the matter of assessment methodologies, the Bank has encountered serious constraints for economic appraisals of projects, and has worked more on adapting social and environmental impact assessment methodologies. For economic appraisals of road projects, the HDM-4 model³⁷ is the tool of choice for cost-benefit analysis of intercity highway projects, but most of the region's countries have serious constraints for the use of this methodology. For one thing, it requires a

reliable current database, and most country databases are very weak. Consequently, baselines for traffic projecting are calculated using very weak and not always explicit assumptions and thus are unreliable. Furthermore, road development externalities, particularly in road network extension projects, are not duly taken into account.³⁸ In such circumstances investment decisions and priority rankings have more to do with the subsector's political economy than with the findings of rigorous economic analysis, and better sensitivity analysis is needed.

- 2.30 The social and environmental impact assessment of highway projects also presents major challenges, particularly given their multiple and often hard to estimate long-run impacts. To address that issue, the Bank has incorporated strategic environmental assessments (SEAs)³⁹ in a number of integrated highway corridor projects. The SEA guidelines that it completed in April 2009 see this assessment approach as a flexible management tool readily adaptable to political-institutional contexts not just of countries but of the decision culture as well.⁴⁰
- 2.31 With regard to the contributions of IIRSA and the Mesoamerica Project to development of planning and assessment methodologies for the region's road assets, previous OVE evaluations of those two initiatives concluded that both had created valuable opportunities for deepening consensus around integration highway corridors and spurred the interest of MFAs that are lending for such corridor ventures.⁴¹ However, these initiatives have two fundamental limitations. First, they offer no intervention models or benchmarks against which to measure the regional integration impacts of projects. Second, no specialized finance products have been developed specifically to support the development of integration infrastructure and properly distribute its costs and benefits, with one exception: the Infrastructure Integration Fund (FIRII) that is providing grant funding for preinvestment studies for integration infrastructure. Thanks to FIRII support, economic and environmental impact assessments have been done of ventures around which there already was cross-country consensus, and Bank lending for this sector has revived in recent years.

III. EFFECTIVENESS OF THE BANK'S ACTION

- 3.1 The Bank's road sector impact in each country in Latin America and the Caribbean is determined largely by the intensity of its support and its duration over time. Over a near-two decade span, it approved fewer than three loans in each of thirteen countries and one or none in six countries. The other seven—Bolivia, Brazil, Colombia, Guyana, Honduras, Nicaragua, and Peru—accounted for fully 59.3% of loan approvals and 48.3% of lending. The Bank's effectiveness and lessons learned can be expected to be most appreciable in the countries where it was most prominent as a source of road financing and maintained the closest policy dialogue.
- 3.2 The Bank's work in the above-mentioned seven countries selected for closer review was driven by the countries' own agendas, adapting to sector strategies and the learnings from new products and vehicles essayed. The case studies provide a

picture of the broad spectrum of situations existing across the region, and each examines country-specific constraints and gains. Though each case study is unique, all center on an assessment of what the Bank's road subsector operations accomplished toward the specific objectives most frequently set out in its projects: improve road asset quality, reduce the sector's vulnerabilities, and improve road safety (see Annex IV).

A. Effectiveness in selected countries

1. Bolivia

- 3.3 The Bank pursued two central aims in the highway projects it funded in Bolivia. The first was to help extend and integrate the country's road network to connect its fragmented territory and improve cross-border links. The Bank partnered with other financing agencies (CAF, the World Bank, the Brazilian development bank BNDES, and other bilateral lenders) to fund an ambitious program to build and enlarge major highway corridors and support a broad institutional reform agenda to reduce the sector's very high political vulnerability.

***Bolivia: Territorial integration** The Bank's prime work focus in its Bolivia highway projects was to help fill the huge gaps in the country's road stock that, by the early 1990s, was one of the most underdeveloped in the region, with a density of just 0.04 kilometers of road per square kilometer and only 20% of the main road network paved. This weak territorial integration within and across Bolivia's borders was a stiff barrier to its economic competitiveness and to poverty reduction. The country's rugged terrain, weak road sector institutions, and low financing capacity were compounding factors.*

The Bank's engagement was extensive. With its support, work was done on more than 600 kilometers of roads (roughly 5% of the main road network), about half of it new construction or expansion and the rest rehabilitation of roads in poor condition. In all, the Bank approved 8 loans and 12 TCs during the review period, partnering in each program with other finance agencies.

As a result of that effort, public highway investment rose from 30% of total public investment in 1980 to 45% in 2005, roughly 3% of GDP. But the sector's vulnerability to political changes and budget shortfalls has kept the road network in precarious condition.

3.4 The Bank was a pioneer in supporting and developing environmental management in road projects. The 1990 Patacamayo-Tambo Quemado project, the first to feature a relatively complete environmental assessment, introduced such focuses as environmental compliance monitoring, community engagement, protected area consolidation, and environmental management in road asset administration and development agencies. In the case of the Santa Cruz-Puerto Suárez highway project (2002), the environmental and social impacts were of such magnitude and complexity that they were addressed in a separate operation, which was not particularly effective. Problems in implementing the SEA recommendations, institutional weaknesses that hampered the environmental mitigation programs, and implementation variances created lengthy delays and schedule slippages in both projects. The planned pre-construction mitigation activities had to be carried out with other funding or were canceled. In fact, one highway section was completed before the associated socioenvironmental mitigation activities even began.

3.5 Cost overruns and delays in road infrastructure works delivery were a constant in Bank-funded projects in Bolivia. The list of reasons includes the lack of adequate data and shortcomings in investment planning and assessment tools; low technical caliber of preinvestment work, which necessitated changes in the originally planned works and investments and created slippages and cost overruns

- (particularly severe on the Santa Bárbara-Cotapata highway section);⁴² delays in works tendering and the need for contract renegotiations owing to contractor market distortions; and weak country institutional capacity coupled with unsatisfactory Bank monitoring and supervision, despite the audit and supervision arrangements that had been built into the operations.
- 3.6 Despite massive efforts, Bolivia's highways still are under-maintained, and work to conserve or improve road quality is always susceptible to fluctuating public budgets. The Bank supported an array of products and approaches to make road maintenance more sustainable, in some instances tying its loan disbursements to assurances of maintenance funding. Even so, the gains won were modest and short-lived. In light of that low success rate, around 1999 the Bank began including funding in its loans for routine maintenance under private contracts, delivered by specialized organizations. Since then it has gradually increased its lending to finance the contracting of road maintenance firms. In 2007, to address the risk that the gains achieved might be erased, the Bank approved a loan targeted almost entirely to maintenance of Bolivia's main highway corridors under specified-performance contracts (Performance-based Road Maintenance Program, BO-L1015) in a bid to instill a new comprehensive approach to road upkeep and revitalize the maintenance culture.
- 3.7 The successes posted in reducing the political vulnerability that weakens road sector decision making and impedes efficient resource use were short-lived as well. Support for development of tools, mechanisms, and solid institutions was a component of virtually every Bank loan to Bolivia, as well as the prime objective of four TC operations. In all, the Bank lent over US\$13 million and delivered some US\$2.5 million in technical cooperation to help strengthen Bolivia's highway administration and management institutions. The initial capacity buildup of the National Roads Service (SNC) was followed by a failed decentralization program (1998-99) that resulted in the loss of SNC personnel and the competencies they had developed. Subsequently the Bank supported the creation and technical capacity building of a new road planning and management agency, the Bolivian Highway Administration, and the development of road asset and road maintenance plans to systematize decision-making and shield it as much as possible from political winds. However, the sector's vulnerability to political changes continues to impede the consolidation of an effective institutional base.

2. Brazil

- 3.8 The main focus of the Bank's program with Brazil was to support decentralization of highway responsibilities and transfer of highway management to private operators to afford road quality assurances over the long term. During the evaluation period, the Bank approved 24 highway project investment loans: 15 to support decentralization and rehabilitation of roads that were state government responsibilities, 5 as direct financing to private concessionaires,⁴³ and 4 to finance federal highway rehabilitation work. Seven TC operations also were approved over that period.

Brazil: Decentralization and private participation

By the mid-1990s Brazil's road infrastructure was steadily deteriorating because of low investment and poor maintenance. To address that situation a program was launched to rehabilitate federal highways, transfer them to the states, and then concession out their management to private firms. The goal was the transfer of 30% of the federal highway network to the private sector, 7,093 kilometers by the federal government and 11,050 kilometers by state governments.

That transfer of highways both from the federal government to the states and from the states to private operators took far longer than originally planned, and after being instituted in 14 states the process was shelved. Likewise, the concessioning process was halted in 1999 and not revived until 2008, even though the privately operated roads were acknowledged to be in better condition than the others. That decision was the result of a series of factors such as contract design and formalization issues, constraints for identifying new roads that would attract users prepared and able to pay tolls, and a growing perception of regulatory restrictions that kept private investors away.

3.9 Timetable slippages were an issue in a large percentage of the Bank-funded investment projects at the federal and state levels alike, caused by problems with timely counterpart fund availability during the early-1990s fiscal crisis and flawed project designs that created setbacks and cost overruns. According to the PCRs for five completed state highway projects (Ceará, BR-0253; Santa Catarina, BR-0355; São Paulo, BR-0295; Bahia, BR-0278; and Rio Grande do Sul, BR-0251), the transportation efficiency and road safety gains achieved in those operations were close to the original goals, whereas there were substantial differences in ex ante and ex post internal rate of return calculations. The fact that the variance was considerable in virtually every project raises legitimate questions about the methodology and data used for the ex ante and ex post project calculations.

3.10 The Bank's involvement in financing private ventures was very relevant to mitigate the regulatory risks of concessions and, in particular, risks associated with changes in investments and tariffs over the life of a concession. The works called for in the four financed operations were delivered and the Bank's contributions were disbursed satisfactorily except in project BR-0306, which was kept on the watch list because of issues of thin traffic. Since the Bank's funding was canceled early on owing to changes in the financial market, there is scant up-to-date ex post information.

3.11 With regard to approvals of projects intended for subsequent transfer to the private sector (BR-0150 and BR-0216), there is no evidence of any undertaking between

the federal and state governments for that handover. Neither project achieved its institutional component's objective relating to that transfer, though the physical works targets were delivered. The two projects pioneered support for the country's prime strategy to transfer rehabilitated highways to the states, then immediately transfer them over to private concessionaires. The project had set specific targets for the concession process, namely toll station construction and drafting of contract terms for the transfer, but in the end the toll stations were not built, and the lack of counterpart funding created lengthy slippages.

3.12 Owing to the complexity of the Brazilian government's road sector strategy, the objectives pursued in the Bank's country strategy and projects ultimately had to be rescaled (see text box "Brazil: Decentralization and private participation"). After more than 15 years, barely 2,000 kilometers of roads are being privately operated, just 25% of federal highways are in good repair, and the country needs to invest an

estimated US\$5 billion.⁴⁴ The Bank's support for road infrastructure rehabilitation and sector institution reforms proved to be highly relevant given Brazil's pressing investment needs, but its support for private-sector engagement was affected by a lack of political support that hindered the taking of thorny and publicly contentious decisions. In such circumstances, even though the Bank consistently fitted its strategy to the country's strategy, structural reforms were put off and the constraints for private participation in highway operation and management were spotlighted.

Colombia: Support for public-private partnerships

Colombia's highway network performance in recent decades has been driven by two concurrent processes: decentralization of road management and re-hierarchization of roads, and private-sector engagement. In each of them, chapters of progress and high hopes have alternated with serious problems that set back the initial prospective gains. This prompted course corrections and in some instances reversed the quality gains already won.

Issues in the first road concessions had to do with sector agencies ill-equipped for monitoring and compliance work, regulatory weaknesses, and contractual imperfections, including an over-emphasis on speed in contract awards. In the first 11 concession ventures, concessionaires were given minimum revenue guarantees based on traffic forecasts that never materialized: the result was some US\$52 million in debt to concessionaires by 2005. Designers of the second- and third- generation concessions addressed the aforementioned problems through regulatory and contracting improvements and development of effective oversight and compliance capacity.

Actual achievements during the private concessioning exercise were more modest and slower in coming than the original targets, which had called for 30 roads to be concessioned to private operators on a BOMT (Build-Operate-Maintain-Transfer) basis.

3. Colombia

3.13 The Bank was heavily engaged in Colombia's highway sector, having supported core processes in that sector's development: revamping of institutions, decentralization of road system responsibilities and management, and private-sector engagement to bolster road infrastructure expansion and maintenance. In all, the Bank approved eight loans (US\$597 million) and five TCs (US\$3.5 million) for Colombian highway projects as well as three consecutive "Programs to Support Private Participation in Infrastructure Concessions" that contained a highway component. Only one of those projects, intended to rehabilitate Colombia's main highway corridors, was completed during the review period.

3.14 The transport corridor loan's effectiveness was limited by issues associated with flaws in the ex ante technical appraisal and in the design of the institutional support component. The highway program's ultimate outputs differed from the original proposal because by the time the final designs were produced the condition of the roads had changed. Likewise, the ex post economic evaluations of Bank-funded highway segments showed smaller gains than the ex ante estimates because of cost overrun issues and overly optimistic and hence inaccurate estimates of the traffic the highways would carry. The program's budget line for institution-strengthening was not used because the government had other funding sources for that purpose.

3.15 Support to involve the private sector in road asset expansion and management was one of the Bank's core areas of focus. It approved three consecutive loans for Programs to Support Private Participation in Infrastructure, one TC to fund the Public-Private Partnership Program for highway corridors, and one direct private-sector loan,

subsequently canceled. The first operation (1996) helped structure "first generation" road concessions; by mid-August 2002 a total of 14 such ventures had

been set up in Colombia. The aim of the “second generation” concessions being to better distribute risk, they required more detailed concession studies and project designs.⁴⁵ The private-sector engagement process was relaunched in 2004 to create “third generation” concessions designed to remedy problems identified in the first two generations, via activities to bolster regulatory frameworks, build up public-sector capacity to administer private concessions and ventures, and promote these processes at the national, departmental, and municipal levels.

- 3.16 The aim of the second phase of the Program to Support Private Participation (2004) was to design and structure road maintenance funds (RMFs) and finance consulting assignments for highway concession project preparation. The original proposal was to set up three RMFs with private participation, but ultimately the RMF strategy was dropped because of changes in Colombian government road maintenance policy that gave priority to public-private partnerships for public works contracting. Consequently, the later-year areas of focus under that Bank operation were urban transport and airports.
- 3.17 Colombia has gone through a lengthy and costly learning exercise to remedy pitfalls and problems in the selected contracting models. Though the Bank has been Colombia’s steadfast partner all along that process, a number of factors have limited its road subsector relevance and effectiveness: an incomplete understanding of the most suitable contracting models; weaknesses in analyses of the institutional and fiscal implications of moves to engage private enterprise in this sector, and a lack of current data and management plans and tools, among others. Two new operations approved in 2008 are intended to overcome those constraints. The first loan is financing the third stage of the two operations mentioned earlier to build up institutional capacity and develop regulations and technical expertise; it will modernize transportation regulation and bring new management technologies into this sector. The second operation would consolidate support for road sector decentralization by developing technical and institutional tools to deliver efficient, continual support to the departments for road and transport management.

4. Guyana

- 3.18 Since 1990 the IDB has been Guyana’s leading partner in road rehabilitation and maintenance. Five of the six loans approved for that subsector were financed out of the Bank’s Fund for Special Operations along with seven associated TCs for preinvestment work. Despite some implementation efficiency issues early on, these operations have done a great deal to improve the state of repair of Guyana’s roads and the pace of road project delivery.
- 3.19 The two concluded projects (GU-0005 and GU-0056) experienced major slippages owing to executing agency weaknesses and design issues associated with the poor quality of previous studies and the lack of reliable preinvestment studies, and recurring consultant selection and contracting issues, which showed up in investment cost overruns. On the institutional capacity building side, the first project posted some definite successes—a new internal audit office and road safety

unit and a road maintenance management system in place. Especially noteworthy was the Works Service Group created out of the project execution unit as the organization in charge of the Ministry of Public Works' investment program. Consequently, the second project executed more efficiently, capitalizing on the enhanced technical expertise the country built up in its Works Service Group authority. Though the PCRs suggest that these two projects may have achieved their stated objective of reducing travel times and costs, the evaluation team found no substantiating data.

- 3.20 During the evaluation period, more than half of Guyana's main highways (252 kilometers of the 500-kilometer total) were rehabilitated with Bank assistance, and MFAs and other international cooperation providers supplied funding to maintain the rehabilitated roads. Counting support received from other finance agencies, virtually the entire 500-kilometer highway system was rehabilitated. This alone is a signal achievement for the subsector. However, in the absence of reliable databases about the state of the country's roads, this affirmation cannot be substantiated or the impacts measured. A Routine Maintenance Management System has been instituted to replace force-account maintenance of the country's main highways with private contract maintenance. As a further gain, the country now has fairly stable and technically competent core delivery capabilities. At this writing some 330 kilometers—roughly 70% of Guyana's highway system—are being maintained under the Routine Maintenance Management System. The other 30% are being rehabilitated or the first steps have been taken for their rehabilitation, including funds for subsequent maintenance.
- 3.21 The Bank has played a prominent role in road infrastructure rehabilitation in Guyana, and to judge from its planned new operations it stands to have an impact on expansion of the current road stock. So long as international cooperation funding continues to flow into the country, its main highways likely can be kept in good repair and systems and capacities can be maintained. However, one outstanding concern for the Bank's intervention strategy is the subsector's sustainability. The risk is that when external cooperation flows end, Guyana's highways would again be under-maintained and the work to date could be undone.

5. Honduras

Honduras: An uphill task

The Bank has been a key and enduring partner in Honduran highway development. During the evaluation period, it approved nine loans (US\$461 million) for work on main highways, two of them specifically to rehabilitate infrastructure damaged by natural disasters or events. The sector's three most serious vulnerabilities (public budget shortfalls, political changes, and natural disasters) were in evidence throughout the review period, undermining country efforts and limiting the effectiveness and sustainability of Bank-backed activities. A string of events—a severe fiscal crunch (1993), Hurricane Mitch's devastating effects on road infrastructure (1999), and a shift in road sector priorities following political changes (2006)—have kept the country's highway network in precarious condition.

By 2009 the state of Honduran highways was rated very poor and the country did not have the resources to rehabilitate them. Road travel also has become more dangerous: Honduras reported higher road accident rates in 2008 than in 2007. In May 2009 the World Bank approved the second stage of a loan to rehabilitate Honduran highways and improve their management. Among its objectives are, once again, capacity strengthening of the Public Works, Transport, and Housing Ministry and the Road Fund. The target—roughly the same as at the start of the review period—is to have 75% of the highway network being maintained by the end of the project. These kinds of approvals point up the circle of successive interventions with financing to attain similar goals but without assurances of long-run sustainability because the sector's vulnerabilities have not been overcome.

3.22 During the first years of the period examined here, the priority of the country and the Bank was to rehabilitate road assets that had suffered severely as a result of the political and economic crisis that beset all of Central America during the 1980s. Loan HO-0040 (1991) marked a shift in the Bank's strategy since it focused strictly on road rehabilitation, widening, improvement, and maintenance, with no new road construction. The program's institutional component called for a restructuring of the Ministry of Communications, Public Works, and Transport (SECOPT) to outsource road maintenance operations to private firms, most of them managed by former Highway Department personnel. The program also was to help devise a stable funding vehicle akin to the Road Funds. The strategy pursued was supported by parallel CABEL, World Bank, and bilateral loans.

3.23 The program's ultimate rehabilitation and maintenance targets were 83% of highways in good condition and 67% of maintenance operations privatized. The Bank-backed US\$202 million investment program was executed in its entirety. A further US\$100 million was expended, most of it World Bank funding to bolster the IDB's strategy. This massive planned investment by Honduras in its paved road stock improved the roads' service levels, leaving 60% of them in good repair by 1998. That was the maximum achieved, and though it undershot the original 82% target it marked a vast improvement in the state of the country's highways.

3.24 Counterpart funding shortfalls following the severe fiscal crunch of 1993 created major slippages in the investment program. Incomplete or flawed project designs and complicated works and consulting service procurement and contracting procedures also contributed to the near-two year setback in the program's implementation. On the institutional side, the Ministry of Communications, Public Works, and Transport (SECOPT) was reorganized and decentralized to become the Ministry of Public Works, Transport, and Housing (SOPTRAVI). Its staff was slashed and all design work, supervision, construction, and periodic and routine maintenance were privately outsourced. In 1993 the Honduran Congress passed the Road Maintenance Fund Act, but budget constraints held up the Fund's rollout and it did not become

operational until 1999. This situation also undermined SOPTRAVI's technical knowledge base as low salaries caused an exodus of skilled technical staff, severely shrinking the ministry's institutional capacity.

Road Maintenance Funds

In the early 1990s the acknowledged chief concerns about the region's road sector were the deterioration of road networks as a result of mounting budget shortfalls and the shrinking capacity of government road asset planning and management agencies. Exploring ways to remedy those two problems has been a constant in the Bank's road sector engagement. The strategy it pursued to that end was two-pronged: help countries set up dedicated routine road maintenance funds (RMFs) and create specialized agencies with technically competent staff and the right methodology tools for efficient, timely road asset maintenance.

RMF revenue sources were motor fuel tax proceeds, public budget appropriations, and toll receipts. The specialized agencies set up, with a degree of operational autonomy, to run RMFs were managed by boards on which government authorities and the RMF beneficiaries and funders were represented.

Creating RMFs proved to be a protracted, complicated process in virtually every country, given the difficulty in achieving political agreements to give road maintenance priority over other expenditure, and a curtailing of budget discretionality begrudged by the executive branch. Nevertheless, thanks to the advances achieved, maintenance work became more consistent and efficient and road asset quality improved in every Central American country where this strategy was pursued.

The model has been less successful on the sustainability side because of issues with timely availability of funds and their use in road rehabilitations for which they were not intended. It would appear that an even greater monitoring and strengthening effort will be required if the gains achieved are to be preserved.

3.25 By 1999 past gains had been reversed: once again the road network had deteriorated, leaving only 33% of it in good repair. Hurricane Mitch, in particular, devastated the nation's road infrastructure. In the second stage of its support the Bank therefore focused on recovering, once again, some of the previous-period gains, approving two emergency loans (HO-0143 and HO-0164) for that purpose. Though the Bank's emergency assistance was positively rated for physical target achievement, it took two years to arrive owing to delays in eligibility declarations and subsequently because detailed engineering designs were lacking for projects slated for financing. Missing or flawed engineering designs created setbacks and cost overruns and prompted frequent renegotiations. Compounding the problem were bureaucratic delays in satisfying Bank and Honduran government procurement and administrative requirements, which according to the PCRs for these operations pushed up costs. SOPTRAVI's weak institutional capacity complicated execution of the emergency loans: the project execution unit had been all but dismantled and SOPTRAVI was underequipped to manage an operation this complex and problematic.

3.26 To address the issues of institutional weaknesses and severe loan implementation slippages, the Bank approved an innovation loan for the Program for Sustainable Institutional Strengthening of the Road Sector (HO-0116, 2002). The diagnostic assessment done for that operation found SOPTRAVI to be underequipped for road asset planning and management and, in particular, for execution of emergency works, some of which had taken more than double the scheduled time to deliver and came in at double the budgeted cost. The institutional strengthening program helped the Bank's emergency operation execute more efficiently but did very little to sustainably strengthen road sector institutions. Though the outputs were developed as planned, the change in government held up their approval and implementation, and the ensuing staff turnover erased the technical capacity building gains that had been achieved. The 2006 political changes brought with them shifts in priorities and arrested the ongoing institutional change processes. Once again the country found itself with a loss of technical expertise and difficulties to keep up budget

appropriations for the Maintenance Fund.

6. Nicaragua

- 3.27 In early 1990 Nicaragua launched a program to rebuild its road network, which had fallen into severe disrepair during the previous decade and had left that country with the thinnest road density and poorest-quality roads in Central America. To assist that endeavor the Bank approved seven loans totaling US\$261.6 million. From an initial focus on rural and secondary road rehabilitation, the effort moved to rehabilitation of the Pan American Highway and, more recently, expansion and rehabilitation of Central American integration corridors under the Mesoamerica Project (echoing the Honduran experience).
- 3.28 Across the period examined here, the Bank also supported institution-strengthening in Nicaragua's road sector and, in particular, pushed for creation of a Road Maintenance Fund (FOMAV) to make the sector less susceptible to budget swings and enhance road network sustainability. The total FOMAV-maintained road length increased steadily from 2003 to 2009, but despite that enormous finance effort, a combination of budget constraints, unsteady institutions, and natural disasters have muted the impact on the condition of Nicaragua's roads, which remain in deplorable state, with just 15% rated in good condition in 2008.
- 3.29 Creating a Road Maintenance Fund in Nicaragua (2000) proved to be a slow, complicated exercise because of difficulties in achieving political agreements to give road maintenance priority over other public expenditure, primarily social spending. Activities to make road maintenance sustainable figured in every Bank road loan approved for Nicaragua during the evaluation period, including funds to be expended via FOMAV or even as conditions precedent to implementation. It was 2005 before the Nicaraguan Congress enacted a motor fuel tax to feed FOMAV.⁴⁶ Progress has been slower than expected, and the high vulnerability of road maintenance to changes in government and budget constraints was passed on to FOMAV.
- 3.30 The institutional shortcomings of executing agencies, lack of the requisite project studies and final designs, difficulties in coordinating with the partner financing agencies, and slow tendering and procurement processes are the chief reasons for the large time slips and cost overruns reported in Bank-funded road projects. Moreover, turnover in technical staff and at the most senior executive levels makes it hard to preserve an institutional memory in the road sector and severely limits institution-strengthening gains. Indeed, the actual gains on that front having been meager. As a result of electoral cycles, the sector continually has to contend with personnel and strategy changes.

7. Peru

- 3.31 The Bank's strategy for its road-sector activity in Peru during the evaluation period evolved through two distinct stages associated with the country's political cycles. In the first stage, up until the early 2000s, the Bank's support focus was a public

- investment program to improve the quality of Peru's highways, along with a mostly unsuccessful effort to engage the private sector in highway management and operation. During the second stage, starting in 2002, the Bank's operations helped the Peruvian government further the decentralization program relaunched in 2003, pursue public-private partnerships to expand and upgrade major highway corridors, and manage and maintain road assets more efficiently.
- 3.32 The US\$840 million in Bank lending during the first phase (1990 to 2001) for three projects—PE-0025, PE-0131, and PE-0197—focused on rehabilitation of the Pan American Highway, road agency capacity strengthening, and private-sector participation. The road-length rehabilitation targets in the loan documents were in every case below and different from the ones initially envisaged, owing to approval delays and the effects of natural disasters that forced a shift in priorities. Because of those setbacks, what had originally been intended to be maintenance work became rehabilitation work instead, and the maintenance targets could not be reached because costs had been underestimated at the outset. Furthermore, the third loan was slashed by half in the wake of the country's political and financial crisis that prompted two reformulations of the operation (2001 and 2003). All the loans had institution-strengthening components; the last of them included substantial funding for the private concession process. Two acknowledged successes over this period, made possible with Bank support, are the creation and strengthening of the national road transport agency PROVIAS out of the loans' executing agencies⁴⁷ and development and implementation of highway management plans and tools. The progress made on engaging the private sector in highway management and operation was modest at best.
- 3.33 Increases in public infrastructure investment in the 1990s took Peruvian numbers closer to the comparable-country average but fell short of the country's investment requirements. The road sector's very high susceptibility to budget shortfalls, natural disasters, and political changes also was much in evidence: the budget deficit was the main reason why a portion of the proceeds of active loans was canceled toward the end of the 1990s. Peru's road infrastructure also was severely damaged by the 1998 El Niño event.⁴⁸ Compounding those problems, a serious political crisis in 2000-2001 led to high turnover at the Ministry and all but halted execution of the Bank's loans until 2003. And when southern Peru was struck by an earthquake in 2001, the government had to repair and rebuild roads that had not been on the priority list. Consequently, by the end of the 1990s, Peru's road density (kilometers of road per square kilometer) still was among the region's thinnest and its paved road stock one of the smallest.⁴⁹
- 3.34 Peru's road sector policy aim from 2003 forward was to further decentralization and foster public-private partnerships in order to create a virtuous dynamic that could fix physical infrastructure deficiencies and also ensure that road asset quality gains would be enduring. To assist with decentralization, a 2005 Bank loan funded measures to strengthen the country's secondary road network managed by the regional governments (Departmental Road Program, PE-0236), and a technical

cooperation operation (PE-T1063) helped build up institutional capacity in the Junín regional government. The Bank approved a private-sector loan in 2003 (PE-0235) and, more recently, a Conditional Line of Credit for Investment Projects (CCLIP) (PE-L1006) to rehabilitate and upgrade the national highway network and privatize its eventual maintenance under a variety of contract formats ranging from the integrated rehabilitation and maintenance (“CREMA”) model to contracts with microenterprises to draw on the wealth of experience built up in rural road maintenance.⁵⁰ The Highway Transport Sector Program approved in 2009 (PE-L1069) will be helping the country with short- and medium-range planning of highway transport infrastructure maintenance and improvements and institutional and technical capacity building in the Ministry and the program executing agency (PROVIAS Nacional).

- 3.35 The Bank is seen as a key partner in technical and policy dialogues around private-sector engagement. The private participation process began in the mid-1990s, picked up strong momentum from 2002 forward, and has been reaffirmed most recently in the Economic Stimulus Plan rolled out in 2008.⁵¹ Public-private partnerships have been the vehicle of choice for highway expansions in IIRSA corridors in parts of the region where capital and maintenance costs are high; as part of the arrangement, the government gives the private operator a 25-year minimum traffic (and hence minimum revenue) guarantee.⁵² This being a relatively novel model, it is too early to assess its sustainability and future prospects, which obviously will depend on the Peruvian government’s financial capacity to live up to its contractual commitments and on how non-concessioned roads are impacted. Experience has shown this model to be inherently fragile in terms of the road sector’s susceptibility to public budget shortfalls and regulatory weaknesses associated with the country’s minimal experience in this area. A number of Bank operations have sought to mitigate the latter contingencies, though the analyses done for recently approved projects did not gauge the risks and provide for appropriate risk management measures.

B. Lessons on effectiveness

- 3.36 The task of assessing the effectiveness of the Bank’s support for intercity highway development is both complex and severely constrained by several factors. To begin with, the Bank’s operations do not include appropriate impact indicators for all the specific objectives pursued, and even where indicators are provided, there frequently are no baselines or post-project measurements. Second, road system data are fragmented, out of date, and generally unreliable, which limits the possibility of using public data sources to ascertain impacts. Third, the Bank’s highway lending is modest relative to country investment requirements, and since most projects also received funding from other sources, attribution becomes problematic if not impossible. A further challenge is the country specificity of road sector needs and issues and the attendant spectrum of options and constraints that determine the effectiveness of the Bank’s engagement, which complicates the necessary abstracting and generalizing task.

- 3.37 The Bank demonstrated that it could adapt ably to country circumstances and policy shifts and learn from experiences in advocating and supporting particular strategies and products. That high adaptability enabled the Bank to keep up a fluid policy dialogue and, in some countries, an ongoing presence. However, frequent course changes on issues like decentralization of functions, responsibility distribution across government agencies, the role and importance of private initiative, and dedicated road finance funds have limited the effectiveness of the Bank's engagement and impeded the consolidation of institutional change processes that are inherently long-run undertakings.
- 3.38 The Bank's effectiveness was severely constrained by successive political changes, budget cycles, and natural disasters in most of the region's countries. These three vulnerabilities, characteristic of the road infrastructure subsector, were the most frequent risks in Bank-funded operations and efforts to mitigate them were insufficient, which limited and at times ultimately reversed expected or actual project achievements. The difficulties in building solid, technically capable, efficient institutions, the low long-run sustainability that continues to be the norm in routine road asset maintenance, and the slim gains in natural disaster risk prevention and management speak to political economy issues in the subsector and its continuing challenges.
- 3.39 The evaluation found that while the Bank did deliver continuous and considerable support to build up institutional capacity in the subsector, that assistance did not remedy institutional weaknesses. The best outcomes were obtained in countries with the most robust institutions; in countries where the institutional base was weakest, the capacity-building and professionalization gains achieved were erased owing to frequent changes of authorities and high staff turnover. In the absence of adequate data and of incentives for efficient road asset planning and management, the Bank's support could not be effectively availed. In some countries the sector reforms brought in overtaxed the technical and regulatory capacity of the agencies in charge, triggered erratic, costly processes, and did little if anything to reduce the sector's vulnerability to political changes.
- 3.40 The majority of completed projects experienced timetable slippages and cost overruns, whereas there was little variance from original goals involving the travel time and cost reductions that were to come with improved roads. The impact of this situation on the internal rate of return of the projects was not apparent. The evaluation team's general observation was that internal rate of return calculations, both ex ante and ex post, had been done without quality control of the estimates and the correlation between assumptions, costs, and benefits. The frequency of changes and corrections raises further questions about the validity of the economic appraisal methodology used as a project decision making and ranking tool.

Contractor market issues

Weaknesses in the road construction, rehabilitation, and maintenance contractor market, which were worse in countries where local rules include barriers to entry of foreign firms, are one of the most frequently reported causes of schedule slippages and cost overruns in the implementation of Bank projects approved over the review period. Varying degrees of contractor market problems are cited for 75% of the 59 projects approved in the countries selected for this evaluation for which monitoring and follow-up data are available (PPMRs and PCRs).

Tendering delays and cumbersome negotiation processes were some of the problems reported. Cases in point are Bolivia projects (BO-L1011, BO-0200), where tenders were called off because of a dearth of contractors and consulting firms with the requisite technical expertise or financial capabilities, and Honduras (HO-0116, HO-0164) where protracted, complicated, difficult to supervise processes created major timetable slippages.

Other issues were mid-execution contract renegotiations and rewrites, mostly because of changes in the state of roads between design and work startup (PE-0236), contractor opportunism during the bid phase (NI-0068), and underestimated completion times and implementation costs (CO-0058).

These issues came up most frequently in countries with weaker contractor markets (Bolivia, Honduras, Guyana, and Nicaragua) where the tendering of construction work affords fewer advantages.

3.41 Cost overruns and time slips in road works delivery were a constant in Bank-funded projects. The following factors had the strongest impacts on costs and completion times:

a. The poor quality of previous and preinvestment studies, which necessitated changes in the originally planned works and investments and completion schedules.

b. Delays in tendering and consulting firm contracting; renegotiations of the scope, duration, and cost of works; contractual distortions and constraints associated with opaque contractor markets.

c. Weak agencies and organizations in charge of executing the loans and unsatisfactory Bank monitoring and supervision, despite the audit and supervision arrangements that figured in the programs.

d. Shortfalls in counterpart funding owing to budget constraints and the loss of political support, which meant shifts in sector priorities and strategies.

3.42 Efforts supported by the Bank to ensure continuing road quality have had mixed results: although definite improvements have been achieved in road asset quality, there are sustainability weaknesses. On the positive side, a road maintenance culture is being instilled, technical competencies for routine maintenance have been built up and specific financing vehicles devised for that work, and, overall, highway quality has been improved through components in the Bank's loans to outsource maintenance to specialized firms. But the question of how to preserve these gains once the flow of external funding ends has yet to be resolved.

3.43 The activities pursued to increase private participation in highway operation, administration, expansion, and maintenance have been very effective, but have not been able to overcome constraints for public-private partnering in this subsector. The Bank's support was effective in replacing force-account highway construction

and maintenance with an array of private-sector maintenance contract formulas, from unit price and quantity models to the more novel medium-term performance-based approach. Less effective were operations to involve the private sector in highway system expansion and management, with the lower success rate here reflecting the constraints and risks associated with such ventures. The Bank's limited effectiveness in that area had to do with structural and political economy

factors as well as an incomplete understanding of the most appropriate contractual approaches, lack of key data and suitable management and supervision tools, and inadequate risk analyses derived from the sector's regulatory weakness and the public finance implications of some of the contracting models selected.

IV. REFERENCES⁵³

- Archondo-Callao, R. 2004. Economically Justified Levels of Road Works Expenditures on Unpaved Roads. World Bank, Transport Notes Series No. TRN-2. November.
- Asian Development Bank. 2003. Road Funds and Road Maintenance. An Asian Perspective. July.
- Bull, A. 2003. Mejoramiento de la gestión vial con aportes específicos del sector privado. Natural Resources and Infrastructure Series. ECLAC. Chile.
- Bull, A. 2004. Concesiones viales en América Latina: situación actual y perspectivas. ECLAC.
- Bull, A., and G. Zietlow. 2003. Los Fondos de Conservación Vial en América Latina. Primer Congreso Regional de Fondos Viales. San Salvador. July.
- 2006. Contratos de Conservación Vial por Niveles de Servicio o por Estándares. Experiencias de América Latina.
- Calderón, C., and L. Servén. 2004. The Effects of Infrastructure Development on Growth and Income Distribution. World Bank Policy Research Working Paper No. 3400.
- Calderón, C., W. Easterly, and L. Servén. 2002. How Did Latin America's Infrastructure Fare in the Era of Macroeconomic Crises? Central Bank of Chile Working Papers No. 185.
- 2003. "Latin America's Infrastructure in the Era of Macroeconomic Crises." In William Easterly and Luis Servén, eds., *The Limits of Stabilization: Infrastructure, Public Deficits and Growth in Latin America*. Palo Alto, CA, U.S.A.: Stanford University Press.
- Colamarco Patiño, B. 2008. Address to the XVII Meeting of the Council of Iberian and Ibero-American Road Directors. Address by the Minister of Public Works. April 2008.
- ECLAC. 2003. Las concesiones viales en América Latina: logros y desafíos. Facilitation of Trade and Transport in Latin America and the Caribbean (FAL) Bulletin No. 208. December.
- Fariña Renes, J., and I. Prior Remiro. Concesiones de Carreteras en América Latina. PricewaterhouseCoopers. Madrid.
- Fay, M., and M. Morrison. 2005. Infrastructure in Latin America and the Caribbean: Recent Developments and Key Challenges. The World Bank. Finance, Private Sector and Infrastructure Unit, Latin America and the Caribbean Region. Report No. 32640-LCR.
- Feinberg, R., and M. Meurs. 2007. "Market Reform and Infrastructure Development in Transition Economies." *Review of Development Economics* 12 (2), 237-247, 2008.
- Fischer, R. Comments on "Latin America: High Logistics Costs and Poor Infrastructure for Merchandise Transportation." Centro de Economía Aplicada, Universidad de Chile.

- Gonzalez, J. A., J. L. Gausch, and T. Serebrisky. 2007. Latin America: Addressing High Logistics Costs and Poor Infrastructure for Merchandise Transportation and Trade Facilitation. San José Consultation.
- Guasch, J. L., and J. Kogan. 2001. Inventories in Developing Countries: Levels and Determinants - A Red Flag on Competitiveness and Growth.
- Harral, C. 1988. Road Deterioration in Developing Countries: Causes and Remedies. The International Bank for Reconstruction and Development. A World Bank Policy Study. ISSN 0258-2120. June.
- Inter-American Development Bank. 1998. Review of Traffic Safety, Latin America and Caribbean Region, Volume 1 Accident Statistics and Safety Inventory. Transport Research Laboratory and Ross Silcock. November.
- International Road Federation. World Road Statistics 2006. Data 1999 to 2004. Imed Ben Hamadi, Puja Pouezat, and Andy Bastienne. Geneva.
- World Road Statistics 2008. Data 2001 to 2006. Imed Ben Hamadi and Sumanth Chittajallu. Geneva.
- Jacobs, G., A. Aeron-Thomas, and A. Astrop. 2000. Estimating global road fatalities. Transport Research Laboratory, Crowthorne, TRL Report 445.
- Leipziger, D. 2004. The Status of Infrastructure Reform in Latin America (presented to the Planning Workshop on Infrastructure in East Asia: The Way Forward, Manila, 15-16 January 2004).
- Liu, Z. 2005. "Transport Investment, Economic Growth and Poverty Reduction." Journal of Transport and Infrastructure, The Asian Journal 12(1):16-31.
- Organization of American States. 2001. General Study on the Vulnerability of Road Segments to Natural Hazards of the Pan American Highway and its Complementary Corridors in Central America. Working Document. Prepared with the support of the Department of Transportation of the United States of America. March.
- Overseas Development Institute (ODI). 2000. Poverty and Transport (a report prepared for the World Bank in collaboration with DFID).
- Porter, M. E., and K. Schwab. 2008. The Global Competitiveness Report 2008-2009. Switzerland, SRO-Kundig.
- Republic of Chile. 1997. Organización Administrativa y Sistemas de Gestión del Mantenimiento (M3). Version 2.
- Roberts, P., K. C. Shyam, and C. Rastogi. 2006. Rural Access Index: A Key Development Indicator. The World Bank Group. March.
- Ruster, J. 1997. A Retrospective on the Mexican Toll Road Program (1989-94). World Bank. Finance, Private Sector and Infrastructure Network. Public Policy for the Private Sector, Note No. 125.

Sánchez, R. 2003. El pago por el uso de la infraestructura de transporte vial, ferroviaria y portuaria, concesionada al sector privado. Natural Resources and Infrastructure Series. ECLAC. Chile.

Sánchez, R., and G. Wilmsmeier. 2005. Provisión de infraestructura de transporte en América Latina: Experiencia reciente y problemas observados. Natural Resources and Infrastructure Series. ECLAC. Chile.

Servén, L. 2008. Infraestructura y desarrollo en América latina: avances y retos. “Infraestructura 2020” Seminar. ECLAC. Chile.

Shilling, J., K. Chomitz, and A. E. Flanagan. 2007. The Nexus Between Infrastructure and Environment: From the Independent Evaluation Offices of the International Financial Institutions. Independent Evaluation Group.

Thomson, I. 2001. El desarrollo institucional del transporte en América Latina durante los últimos veinticinco años del siglo veinte. Natural Resources and Infrastructure Series. ECLAC. Chile. March.

Vega Araya, E., and M. Vega Araya. 2005. Vulnerabilidad ante desastres naturales. ¿Cómo actuar? Centro de Integración de Economía y Ecología (CIECO), Costa Rica. September.

Velazco, A. 2009. Análisis de la Gestión del Presupuesto de Conservación de Carreteras en las Agencias Viales del Perú. May.

World Bank. Private Participation in Infrastructure (PPI) Database. February 2009 query. <http://ppi.worldbank.org/index.aspx>

World Bank. 2006. Safe, Clean and Affordable... Transport for Development. An Update of the World Bank's Transport Sector Priorities for the Period 2007-2015. Washington, D.C.

World Health Organization. 2004. World Report on Road Traffic Injury Prevention. Margie Peden, Richard Scurfield, David Sleet, Dinesh Mohan, Adnan A. Hyder, Eva Jarawan and Colin Mathers, eds. Geneva.

Zietlow, G. 2004. Road Funds in Latin America. German Development Cooperation. April.

¹ Since these road networks carry a huge percentage (over 80%) of the region's personal and commercial traffic, their reach and quality affect country competitiveness, national and regional connectivity and integration, and the population's quality of life.

² Annex I contains a detailed report on the region's road subsector.

³ L. Servén (2008), *Infraestructura y desarrollo en América latina: avances y retos*. “Infraestructura 2020” Seminar. ECLAC. Chile.

⁴ Source: Data from WDI, national ministries, *Datos Básicos Viales* and Instituto Vial Ibero-Americano, several years. See details in Annex I.

⁵ The lack of systematic, reliable data on the region's road infrastructure stocks, quality, and investment and the difficulty in coming up with benchmarking indicators for temporal and cross-country comparisons were constraints for the evaluation. Neither the Bank nor any other regional organization has a current, systematic database to be able to come up with benchmarks against which to assess and compare road subsector performance. The fact that each country has a unique geography and spatial occupation pattern was a further limitation. A singular feature of the road subsector is the lack of

adequate incentives for the costly process of gathering such data, inasmuch as this sector typically does not sell services. Compounding the picture is the difficulty in precisely identifying “major” roads or highways within a country’s total road stock, that being more a country-specific administrative categorization than a firm technical characterization.

6 WHO (2004).

7 World Bank and World Health Organization, *World Report on Traffic Injury Prevention* (2004). Latin America and the Caribbean continues to head the list in the 2020 forecasts at 31 fatalities per 100,000 people, up from 26.1 per 100,000 people.

8 With estimated losses of US\$17.1 billion to US\$34.5 billion annually in 1995-2007, according to reports that put the annual cost of road accidents in the region at 1% of GNP (Jacobs et al., 2000). However, according to a 1998 IDB report that puts the loss tally typically in the 1% to 3% of GDP range the toll could top US\$50 billion annually.

9 A subjective measure with values ranging from 1 (perception that the country’s road infrastructure is underdeveloped) to 7 (perception that road infrastructure is extensive and efficient), which encapsulates the indicators discussed earlier: road density and vehicle traffic (Porter et al., 2008).

10 Gonzalez et al. (2007). In 2007 logistics costs came to 18%-32% of aggregate regionwide sales; this includes incremental costs associated with infrastructure stocks and quality generally (not specific to transport infrastructure deficits).

11 In a 2001 study of inventory levels and costs in Latin American countries, Gausch and Kogan found that Latin American raw materials stocks were up to five times larger than U.S. stocks; finished product inventories were 1.4 to 2.7 times larger. The annual cost of maintaining these inventory stocks exceeds 2% of GDP, assuming a 15%-20% financing rate.

12 See Roberts (2006), Liu (2005), and ODI (2000).

13 See Annex I for a detailed discussion of road infrastructure financing.

14 World Bank (2006).

15 For details see Annex III.

16 A. Bull (2004). *Concesiones viales en América Latina: situación actual y perspectivas*. ECLAC. Colombia and Uruguay have the highest proportions of concessioned roads as a percentage of total paved roads (24% and 20% respectively) but only 2.7% and 2.3% of the total intercity network. Chile has the highest proportion of concessioned roads to total intercity roads: 3.2% of its intercity road system (14.4% of the paved road total) is operated under concessions.

17 A. Bull, *op. cit.* (2004). *ADB, Road Funds and Road Maintenance. An Asian Perspective* (2003).

18 Mexico’s experience is very telling. After an ambitious concession program (1989-1994) that saw 52 toll concessions awarded for over 5,000 kilometers of highways, the government took back control of 23 of the roads and rewrote the contracts for the others. Colombia’s experience with first-generation concessions is particularly instructive (see Colombia case study, Annex IV).

19 C. Calderón, W. Easterly, and L. Servén (2002). *How Did Latin America’s Infrastructure Fare in the Era of Macroeconomic Crises?* Central Bank of Chile.

20 In its resolution approving the new policy and procedures, the Bank’s Board of Executive Directors resolved: “To establish that the eligibility of expenditures financed with investment loans will be determined based on the following criteria: (a) the expenditure is attributable to the project and has a positive impact on its development objective; (b) the project has an impact, acceptable to the Bank, on the borrower’s financial sustainability; (c) the borrower has the fiduciary capacity to guarantee that the resources are used efficiently and are used solely for the purposes for which the loan was granted; and (d) the project is technically, financially and economically viable.”

21 All figures in this report are in 2000 U.S. dollars.

22 See Annex II for an analysis of Bank projects over this period.

23 The evaluation looked only at operations over US\$150,000 (original approved amount).

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- 24 However, in the case of Argentina, a single US\$1.2 billion loan approved in 2007 (AR-L1014, Norte Grande Road Infrastructure Program) explains the high percentage for that country. This was the largest single loan approval in the Bank's history.
- 25 Other countries with considerable approval volumes relative to total paved road length or per capita were Costa Rica (but with a single and recent loan approval, in 2008); El Salvador (two loans, but mostly for rural roads, with sector institution-strengthening components that prompted their inclusion in this evaluation), and Guatemala, also with just two loans. Calculations done for the remaining countries reveal marginal, sporadic engagement.
- 26 CABI was not included in the analysis though it is a major provider of intercity road finance in Central America specifically.
- 27 The analysis in this section draws on available data for 1990-2008.
- 28 The analysis in this section draws on available data for 1990-2008.
- 29 OVE's classification of the objectives set out in loan documents was not exclusionary, i.e., a single project may have had objectives in two or more of these categories. Other stated project objectives were road infrastructure rehabilitation following a natural disaster (4.8%) and concessioning out roads to private operators (8.6%); some had much vaguer objectives that were not put into any of the aforementioned categories (10.5%).
- 30 For instance, some recent studies under the Initiative for Integration of Regional Infrastructure in South America (IIRSA) endeavor to develop methodologies to measure project impacts on regional production integration and logistics services, as a tool to assess the contribution of IIRSA projects to integration of production in their service area.
- 31 Even though data on the core baseline indicators are needed to assess projects using the HDM model, the project matrixes did not provide that information.
- 32 Constraints for private participation in highway construction and rehabilitation were discussed in Chapter I.
- 33 OVE recently produced evaluations of the two initiatives: Evaluation of the Puebla-Panama Plan (document RE-350) and Evaluation of the Initiative for Integration of Regional Infrastructure in South America (document RE-338).
- 34 Integrated rehabilitation and maintenance contracts (known as the "CREMA" system, from the abbreviation of the contracts' name in Spanish) consist of a one-year contract to rehabilitate road sections in poor repair and a contract for subsequent routine maintenance of a road subnetwork for two, four, or five years, performed by traditional contractors. Maintenance work is paid at a monthly lump sum per kilometer, varying by type of wearing course; rehabilitation work is paid on a unit-price basis during performance of the work or by lump sum, part of it spread out over the contracted maintenance period. This formula has been used in Argentina, Brazil, Colombia, and Uruguay (Alberto Bull and Gunter Zietlow, *Contratos de Conservación Vial por Niveles de Servicio o por Estándares. Experiencias de América Latina*) [Performance-based Road Maintenance Contracts. Latin American Experiences]. 14th IRF World Road Congress, Paris, 11 to 15 June 2001.)
- 35 Eight of the 11 intercity highway projects approved in 2008, for instance, had planning and regulatory capacity strengthening components.
- 36 Document RE-303. Evaluation of the Bank's Direct Private Sector Lending Program (1995-2003), Annex III. 2005.
- 37 The Highway Development and Management (HDM) system is a model developed by the World Bank and currently managed by the World Road Association. The HDM-4 model is essentially an engineering simulation tool for simulated project-level cost-benefit analysis of road improvements and analysis of optimum construction and maintenance strategies.
- 38 *El transporte como soporte al desarrollo. Una visión 2040*. V Congreso Nacional de la Infraestructura. Cartagena, Colombia, 20 November 2008.

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- ³⁹ The original definition of “strategic environmental assessment” includes a variety of focuses and methods and encompasses the review of the environmental consequences of certain policies, plans, and programs (European Union Directive 2001/42/EC, Strategic Environmental Assessment-SEA). As such, it encompasses complex development proposals of vast spatial and temporal scale that have significant strategic effects and exceed the capabilities of local authorities. But however many approach avenues SEA may afford, the international community is agreed on one point: strategic environmental assessment does not purport to supplant project-specific environmental impact assessment; rather, it supplements that exercise.
- ⁴⁰ A Strategic Environmental and Social Assessment methodology being developed under the IIRSA Initiative will allow assessments of broader-scope development proposals and take account of road infrastructure development externalities.
- ⁴¹ See documents RE-338 (IIRSA) and RE-350 (Mesoamerica Project, formerly Puebla-Panama Plan).
- ⁴² Though the loan document acknowledged the difficulties of building roads in mountainous terrain and budgeted a higher than usual proportion (20%) for contingencies, the construction period was plagued with problems, even though the Bank itself had funded the preinvestment studies and endorsed their findings, terming them complete and the best alternative for the ends being pursued. OVE. Bolivia, Country Program Evaluation, 2007.
- ⁴³ Does not include loans BR-0235 and BR-0307 Yellow Line Concession (1999), since this is a city access road.
- ⁴⁴ According to the proposal for loan BR-L1031 (approved August 2008), US\$3 billion would be needed for the federal highway system, another billion for roads managed by the National Transport Infrastructure Administration (DNIT), and a further billion for federal roads handed over to the states.
- ⁴⁵ As a result of these two processes, by 2004 a total of 465 kilometers of new highways had been built, 1,500 kilometers rehabilitated, 2,500 kilometers maintained under concession arrangements, and US\$2.6 billion in investment generated in the sector (loan document CO-0263).
- ⁴⁶ Prior to that point FOMAV could only operate as seed money was delivered in IDB and World Bank loans. This achievement is the fruit of Nicaraguan government lobby efforts with support from international finance agencies that work in this sector. The tax was expected to yield US\$12 million in revenues in 2006 once the law took effect. This marked a significant step forward for the road sector, the goal being to maintain 2,000 kilometers of the country’s road network in 2006. That should climb to around 7,800 kilometers once the tax intake target is reached in 2009. Other financing partners in the sector are the World Bank, CABEI, Nordic Fund, Denmark, Spain, OPEC, and the United States Millennium Account. The IDB coordinates closely with these partners in project selection and implementation.
- ⁴⁷ Transport Infrastructure Rehabilitation Program (PERT) and National Road Maintenance System (SINMAC).
- ⁴⁸ According to the proposal for the loan approved in 1998 (PE-0197), 6,392 kilometers of roads sustained damage (884 kilometers completely destroyed, along with 59 bridges). This is 8.7% of the total road system, which the loan document put at around 73,400 kilometers.
- ⁴⁹ A 2008 Instituto Peruano de Economía (IPE) study estimates the money that could have been saved had roads rehabilitated in the 1990s been properly maintained. In their analysis of Peruvian government outlays, the authors found that since 1992 the government had rehabilitated 6,008 kilometers of national highways (38% of the 1990 total national network) and 388 kilometers of departmental roads. These roads had to be maintained (annual routine maintenance and periodic maintenance at five-year intervals) to preserve those improvements. The IPE study found that routine maintenance had been done on only 61% of the kilometers that needed it and periodic maintenance on 21.4%. Moreover, according to the study, by 2006, 22.7% of the roads rehabilitated between 1992 and 2005 were no longer in acceptable condition. In the authors’ assessment, it is difficult to attribute this rapid deterioration to climate factors, so a more plausible explanation is a lack of maintenance coupled with piecemeal or very poor quality rehabilitations. The study looks also at maintenance

expenditure targeting by total road length per department and the state of road assets and finds no correlation that holds consistently over the analysis period.

⁵⁰ According to the PE-L1006 project loan document, road maintenance is to be funded by way of three-year contracts for the most heavily traveled highways, two-year contracts for medium-traffic roads, and one-year contracts with microenterprises for light-traffic roads.

⁵¹ Source: PROVIAS (National Public Transport Infrastructure Investment Authority—OSITRAN) National Highway System, 2009.

⁵² The Infrastructure Privatization Commission (PROMCEPRI) 1997-2000 Concessions Program called for private operation of 10 road subnetworks, totaling about 11,300 kilometers.

⁵³ Direct references to loan documents (design, PCRs, etc.) are not listed.