



Sector Assistance Program Evaluation

Reference Number: SAP: IND 2007-09
June 2007

Transport Sector in India – Focusing on Results

Operations Evaluation Department

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – Indian rupee/s (Re/Rs)

Re1.00 = \$0.022

\$1.00 = Rs45.4387

ABBREVIATIONS

ADB	–	Asian Development Bank
ADTA	–	advisory technical assistance
BIMSTEC	–	Bengal Initiative for Multisectoral Technical and Economic Cooperation
BOT	–	build-operate-transfer
DFID	–	Department for International Development (United Kingdom)
EIRR	–	economic internal rate of return
FIDIC	–	Fédération International des Ingenieurs-conseils (International Federation of Consulting Engineers)
FYP	–	five-year plan
GDP	–	gross domestic product
GHG	–	greenhouse gas
IWT	–	inland waterways transport
JBIC	–	Japan Bank for International Cooperation
NHAI	–	National Highways Authority of India
NHDP	–	National Highways Development Program
OED	–	Operations Evaluation Department
OEM	–	Operations Evaluation Mission
PMGSY	–	Pradhan Mantri Gram Sadak Yojana
PPP	–	public-private partnership
PPTA	–	project preparatory technical assistance
PWD	–	Public Works Department
SARD	–	South Asia Department
SASEC	–	South Asia Subregional Economic Cooperation
TA	–	technical assistance

NOTE

In this report, "\$" refers to US dollars.

Key Words

indian transportation projects evaluations, indian roads highways water ports railways projects evaluations, indian policy evaluations, adb indian transport projects

Director General	B. Murray, Director General, Operations Evaluation Department (OED)
Director	R.B. Adhikari, Operations Evaluation Division 2, OED
Team Leader	N. Singru, Evaluation Specialist, Operations Evaluation Division 2, OED
Team Members	V. Buhat-Ramos, Evaluation Officer, Operations Evaluation Division 2, OED C. Roldan, Senior Operations Evaluation Assistant, Operations Evaluation Division 2, OED

Operations Evaluation Department, SE-7

CONTENTS

	Page
EXECUTIVE SUMMARY	iii
MAPS	xi
I. INTRODUCTION	1
A. Background and Rationale	1
B. Objective, Scope, and Methodology	1
C. Organization of the Report	2
II. THE TRANSPORT SECTOR IN INDIA	3
A. Overview	3
B. Institutional Structure	4
C. Transport Plans and Programs	5
D. Private Sector Participation	7
E. Regional Economic Cooperation	10
III. ADB'S STRATEGIES FOR THE ROAD AND RAILWAY SUBSECTORS	10
A. Evolution of the Strategy and Sector Positioning	11
B. Environmental and Social Safeguard Strategies	15
C. Sector Governance and Anticorruption Activities	18
D. Coordination with Other Development Partners	20
E. Assessment of the Relevance of ADB's Strategies	22
IV. IMPLEMENTATION AND OPERATION OF ADB-FUNDED PROJECTS	23
A. Lending Projects	23
B. Nonlending Projects: Technical Assistance	32
V. ASSESSMENT OF ADB ASSISTANCE	35
A. Relevance	36
B. Likely Effectiveness	36
C. Efficiency	37
D. Likely Sustainability	40
E. Likely Impacts	43

The guidelines formally adopted by the Operations Evaluation Department (OED) on avoiding conflict of interest in its independent evaluations were observed in the preparation of this report. G. Raghuram, Neville Weeks, Prashant Joshi, Bindiya Rawat, Lalit Chugh, and Imelda Baleta were the consultants. To the knowledge of the management of OED, there were no conflicts of interest of the persons preparing, reviewing, or approving this report.

VI.	ASSESSMENT OF INSTITUTIONAL PERFORMANCE	46
	A. Quality at Entry	46
	B. Contribution to Development Results	48
	C. Assessment of ADB Performance	48
VII.	OVERALL ASSESSMENT	50
	A. Assessment of ADB Assistance (Bottom-Up)	50
	B. Assessment of Strategic Performance (Top-Down)	53
	C. Overall Rating of All Levels of Performance	55
VIII.	ISSUES AND RECOMMENDATIONS	55
	A. Main Issues Identified	55
	B. Recommendations for Future Assistance	57
APPENDIXES		
1.	Asian Development Bank Loans and Technical Assistance	60
2.	Ports and Inland Waterways	64
3.	Evaluation Framework and Methodology	74
4.	Profile of the Indian Transport Sector	83
5.	Transport Sector Monitoring Framework	99
6.	Implementation Delays	104
7.	Strategic Positioning in the Transport Sector	122
8.	Assessment of Technical Assistance	127
9.	Evaluation Matrix	137
10.	Assessment of Achievement of ADB's Goals in the Transport Sector	140
11.	Sustainability of ADB-Assisted Projects	143
12.	Socioeconomic Effects of Road Improvements	152
13.	Evaluation Findings of Other Multilateral Agencies	164
14.	Photographs	165

EXECUTIVE SUMMARY

The Asian Development Bank (ADB) has been extensively involved in the Indian transport sector over the past 20 years: by the end of 2006, it had made 25 loans totaling \$5.28 billion to the sector, or about one third of ADB's portfolio of public sector loans to the country. ADB's support has gone to national and state highways, and rural roads; railways; ports; and inland waterways. Roads and highways accounted for 75% of ADB's loan investments in the sector. ADB also provided 27 advisory technical assistance (TA) projects for sector restructuring, institutional capacity building, system planning, tariff setting, and asset revaluation; and 31 project preparatory TA grants for transport project formulation. ADB has been the lead development partner in the Indian transport sector.

The task of evaluating the performance of this portfolio faced several methodological and practical challenges. Only 12 of ADB's transport sector projects in India have been completed; 11 others are ongoing. Future changes in implementation efficiency, policy, and unforeseen events will affect the final ratings of the ongoing projects. This sector assistance program evaluation assesses ADB's interventions in roads and railways. Ports (from which ADB withdrew after 1997) and inland waterways (to which ADB took a hesitant approach before its exit in 2006) are analyzed only briefly in an appendix. Projects and subsectors are rated on the basis of validated project completion reports, project performance evaluation reports, discussions with officials of ADB and the Government, field visits, and interviews with stakeholders. This report is based on facts drawn from close consultations with the Government officials and ADB staff.

Demand for Transport Infrastructure

Poor infrastructure, particularly in the transport sector, is widely recognized as a major constraint on sustained, rapid economic growth in India. The Government is making a massive effort to expand and improve the transport network to meet the high demand, but the billions of dollars needed exceed its funding capacity. Private investment must, therefore, complement public funding. Appropriate governance systems need to be put in place to build an enabling framework for the private sector. While recent experience shows that the private sector has responded to some projects under the National Highways Development Program (NHDP), the private sector has been less interested in projects in which there are concerns about financial viability or where it lacks experience in implementing public-private partnerships.

ADB's Strategy and Assistance Program

ADB's assistance has been aimed at helping the Government address the country's transport needs. At the beginning of lending to India in 1987, ADB placed emphasis on transportation systems and infrastructure. The loans approved in this period supported improvements in India's road, rail, and port transport networks, and in operating systems. In the early 1990s, ADB turned to institutional capacity building, agency restructuring, and policy reforms, including the promotion of private sector participation. Then, as the Government's priorities changed, so did ADB's operational strategy, reflecting the urgency of removing infrastructure bottlenecks and augmenting transportation capacity to reduce poverty through economic growth. Increasingly, too, ADB advocated ways of dealing with the related social issues (e.g., HIV/AIDS, trafficking of women and children, road safety, public awareness), although this focus was generally not reflected in the project implementation. This evaluation rates ADB's transport sector assistance to India from the strategic point of view by looking at

sector positioning, quality at entry, value added, contribution to development results, and ADB's overall performance.

Some transport projects exhibited weaknesses in quality at entry. Development objectives were poorly defined, and capacity building was not given enough attention. Developing a realistic reform agenda for state roads and railways that the Government could lead and ADB could support has been a challenge. ADB's projects included broad reforms that were less realistic, and had to be fine-tuned during implementation.

The Government has criticized the application of ADB's environmental and social safeguards in the transport sector as involving high transaction costs and contributing to implementation delays that offset potential benefits. Unfamiliarity with ADB's requirements, lengthy litigations, conflicts with local laws and procedures, and duplication of activities have been attributed as the underlying problems. Hence, government officials and ADB staff tend to avoid projects with significant environment or resettlement issues. Such sensitive projects are locally funded and apply domestic safeguard systems. In the process, overall development effectiveness suffers, and ADB's position as a trusted development partner in designing and implementing complex projects is diluted.

ADB contributes to development results through a combination of policy and project initiatives. Its strategy of selecting projects in relatively poorer states is appropriate. ADB's transport portfolio has helped remove bottlenecks and has enabled broad-based economic growth and job creation. These are prerequisites for reducing poverty. Moreover, ADB has coordinated with other development partners as needed. Formal and informal coordination meetings with the World Bank and the Japan Bank for International Cooperation were less frequent in the past, but have become more regular now, especially during country programming missions. The recently begun tripartite portfolio review meetings between ADB, the Ministry of Finance, and implementing agencies are seen as effective in addressing implementation bottlenecks.

Strategic Assessment

ADB's support to India's transport sector has been relevant to the country's needs. The interventions address national and state concerns. The evaluation found that (i) ADB's strategic positioning and selection of priority areas are significant and appropriate to the country's needs; (ii) ADB's assistance has contributed to improving the quality of the road and railway infrastructure; and (iii) ADB's value added is significant in promoting policy development, institutional strengthening, private sector participation, and compliance and public awareness of social safeguards. The main weaknesses identified are poor project design; limited enforcement of safeguards; and lack of progress in addressing some key policy issues, particularly in the railways sector.

Implementation of ADB-Funded Projects

Delays in implementation are a systemic problem common to projects funded by the Government, ADB, and other development partners. Like ADB-funded projects, World Bank-sponsored road projects in India are similarly delayed. Contributing reasons relate to complex Government procedures and weaknesses in the construction industry. Among the problems faced by the Indian construction industry are the following: (i) only a handful of the major Indian contractors can undertake large infrastructure projects, and all of these contractors have full order books; (ii) qualified professional engineers with road and railway construction experience

are scarce; and (iii) commercial risks, security issues, and poor living conditions make it difficult to staff projects in remote areas.

Roads and Highways. Only four ADB-funded roads and highways projects have been completed; eight are ongoing. All the projects were significantly delayed at the start because of difficulties setting up implementation units, acquiring land, and obtaining environmental and government clearances. Implementation delays of 18–30 months, combined with delays in loan effectiveness averaging 12 months, suggest that (i) ADB is bringing transport projects prematurely to the Board for approval, and (ii) implementation schedules are not realistic. ADB has recently set up a system of screening projects for readiness based on a checklist of activities to be completed. This could help in resolving the start-up problems, although the checklist could be further fine tuned.

Unfamiliarity with ADB's procedures and the transition within the Government leading up to the establishment of the National Highways Authority of India (NHAI) contributed to these delays in the 1990s. But problems with procurement procedures, land acquisition, and environmental clearances persist and continue to affect project implementation. ADB has yet to resolve the causes of the delays in implementation and to set realistic implementation schedules. Delays in the ongoing projects are likely to be shorter—an average of 2 years—but could be prolonged by several unresolved implementation issues. Main factors contributing to the delays in implementation were:

- (i) **Project preparation and administration:** (a) inadequate or inaccurate project preparation especially detailed project reports; (b) inadequate technical resources in executing agencies and implementing agencies; (c) land acquisition and removal of encumbrances from the right of way; (d) delays in preparation and approval of resettlement plans; (e) unclear environmental assessments and lack of familiarity with the requirements of environmental safeguards; and (f) lack of advance procurement planning.
- (ii) **Contractors' performance:** (a) lack of experienced engineering staff, both for consultants and contractor—this results in poor performance by an overstretched supervision consultant and/or contractor; (b) poor mobilization of equipment; and (c) cash flow problems of contractors.

Railways. Delays in completion have extended up to 5 years for railway projects, largely because of procurement problems. The Indian Railways was perceived to be unfamiliar with ADB's procurement policy. This raises concerns about the adequacy of project management by the Indian Railways as well as ADB. While both initial projects increased, the Indian Railways' freight haulage capacity supporting the implementation of railway reforms is a key focus area of ADB's current program with the Indian Railways. However, implementation of the reforms have been slow and some aspects have been abandoned. Frequent staffing changes in both ADB and Indian Railways played a part in the delays, but slow decision making and implementation of reforms within the Indian Railways are the more deep-seated issues. Implementing structural reforms in a large, complex organization is difficult (the Indian Railways employs 1.4 million people), yet ADB gave inadequate value-added support in enabling the transfer of knowledge and best practices from other countries. The implementation difficulties experienced in the ongoing capital investment project are attributable partly to the Indian Railways and partly to ADB.

ADB-supported transport projects have not been efficiently implemented. Since most of the projects are ongoing, the performance in this respect could improve if effective steps are taken to resolve problems. But first, there must be major efforts and closer interaction between

ADB and the executing agencies to identify and resolve the problems. So far, ADB's efforts have focused more on loan approval than on good-quality project administration, i.e., on proactively identifying and resolving problems together with executing agencies. This lack of balance in ADB's efforts needs to be addressed to achieve better development results.

Relevance of ADB's Assistance

The assistance to the transport sector identified in the country strategies is relevant in maintaining focus on the priority areas defined within those strategies. This rating is based on several factors. First, the sector strategy is consistent with ADB's overall goal of pro-poor growth and with the country's evolving priorities. Expansion of physical infrastructure was the priority for both ADB and the Government at the start of ADB's involvement, and the strategy and projects at that time were in line with this thinking. Later, recognizing the growing importance of policy changes in improving the enabling environment for the transport sector, ADB broadened its focus to include institutional and policy reforms. Second, while continuing to focus on physical infrastructure because of the comparative advantage of its assistance, ADB has adjusted the assistance in light of the growing private sector participation. Third, coordination with other development partners has largely dealt with the geographic distribution of project areas. While the tripartite review meetings in recent years have been an improvement, the coordination need to extend as well to policy and implementation issues common to the other development partners. Overall, the performance of ADB's transport sector program in India is rated **relevant**.

Effectiveness of ADB's Assistance

Roads. ADB's road assistance is targeted primarily to increase capacity. Besides the capital investment, most of the projects have promoted private sector participation in rehabilitation and maintenance activities. This is a positive development. The benefits from the roads and highways projects include shorter travel times, savings in vehicle operating cost, and less congestion. Although a traffic count survey was not part of the evaluation, outcomes were assessed in a socioeconomic survey of a sample of projects that included national highways, state highways, and rural roads. National highways have a larger impact on the regional economy than on the local economy. Discussions with villagers served by the rural roads indicated that better roads improved connectivity, i.e., better access to markets, medical facilities, and education. Overall, the roads and highways projects are expected to increase transport capacity as ADB intended.

Private sector involvement in roads has been growing in the last decade. While this growth can be attributed mostly to policy changes introduced by the Government, ADB's TA also contributed. ADB's projects have assisted in setting up the NHAI, promoting build-operate-transfer contracts, and supporting Indian financial institutions in lending for privately-financed infrastructure projects.

Railways. ADB's assistance in the early 1990s generally helped to increase the capacity of rail infrastructure and, hence, railway revenues. Although there were limited improvements in the 1990s, the operating performance of the Indian Railways has improved in the last 2 years. Long-term, strategic benefits could come if ADB continues its recent initiative of taking the lead in supporting structural reforms in the Indian Railways. However, at present, those benefits are not certain to be achieved. Although the Indian Railways has improved its customer orientation, increased private sector participation, and rationalized tariffs, it has a long way to go before it can operate as a commercial entity. ADB needs to work more closely with the Indian Railways to identify and resolve the bottlenecks in the implementation of capital investment projects and

institutional reforms. While reforms should be structured and implemented by the executing agency, ADB needs to be a more proactive catalyst.

Overall, ADB's transport assistance has been **effective**, but on the lower side. This is attributed to the several shortcomings in implementation. ADB and the Government have the opportunity to rectify the implementation issues and make the assistance more effective.

Efficiency of ADB's Assistance

The efficiency rating for completed projects is based on their economic internal rate of return (EIRR), and that for ongoing projects on a combination of projected and actual EIRR as observed by the Operations Evaluation Mission (in mid-2006). Although for several projects, actual traffic was lower than forecast, the completed projects had EIRRs higher than the benchmark rate of 12% at completion, and are therefore rated efficient. For all ongoing projects, the EIRRs estimated at appraisal were higher than the benchmark. Lower-than-anticipated traffic and implementation delays, which could adversely affect the EIRRs at completion, are common concerns. Because most of the projects are ongoing and all of them face implementation issues, the transport sector program is rated **less efficient** in achieving the objectives of the sector assistance program with the use of ADB resources.

ADB's *Medium-Term Strategy II* states that, to contribute more to country outcomes, ADB must shift from an institutional culture that gives priority to loan approval and lending volumes to a culture where portfolio performance and contribution to country outcomes predominate. The experience in India's transportation sector shows why this change is needed. In practice, ADB's corporate assessment of the efficiency of its operations and the formal and informal incentives for staff performance generally revolve around the amount of loans approved each year. This approach does not reward efforts to improve portfolio performance. Although a good amount of transport loans has been approved since 2001, the progress in project implementation has been poor. Much remains for ADB to do to identify and remove the problems that delay implementation.

Sustainability of ADB's Assistance

Roads. Inadequate funding for maintenance has been a perennial problem in India as it has been in most other countries in Asia. In the short term, NHAI has the financial and managerial capability to implement the NHDP and attract private sector participation. However, its capability to effectively implement the seven stages of the NHDP needs strengthening in the medium term, and there are major gaps in funding. For state highways, the funding needs are relatively lower and must be met from public sector sources as well as private sector participation. But sustainability in terms of ensuring adequate funds for maintenance remains an issue. For the rural roads, funding inadequacies persist. The current rural roads program is massive in scale. It is not clear how it will be supported with sufficient monetary and administrative resources. Overall assistance to the road subsector is rated **less likely** to be sustainable because of concerns related to adequate funding for operations and maintenance.

Railways. The operating performance of the railway has improved since 2004. Gains in operating ratio and revenues have strengthened its financial position. The improvements, however, hide institutional deficiencies—unsustainable employee costs and high-cost borrowings. On the operational side, the Indian Railways has been gradually losing its share of the transport market to roads. Institutional and implementation issues reduce the likely sustainability of the capital projects funded by ADB. The reforms begun in 2003 could address

these issues but implementation has been problematic. Overall, without institutional and policy changes, the sustainability of the railway assistance is rated as **less likely**.

Impact of ADB's Assistance

Despite concerns about the sustainability of the assistance, the potential impact of the completed projects has been modest to substantial: transport projects have contributed indirectly to economic growth and poverty reduction. Good national and state highways support the national and regional economies. Completed road projects, whether funded by ADB or not, have experienced traffic growth. Better access, connectivity, and lower transport costs lead to more livelihood opportunities. Rural roads have had a positive impact on employment opportunities, access to credit, access to health and education facilities, farm-gate prices and agricultural inputs, and access to urban areas. The evaluation findings suggest that the presence of an all-weather road is a necessary (but not sufficient) condition for local socioeconomic improvements. Roads and highways, in general, are likely to have substantial positive impacts, although the specific impact of ADB-funded projects is modest in comparison to the overall needs of the country. In the case of railways, it is difficult to attribute specific impacts to ADB assistance or to any single project, although ADB-funded improvements in the capacity of the Indian Railways have had a positive impact on its ability to carry more traffic. Overall, the potential contribution of ADB transport portfolio to socioeconomic impacts has been **modest but on the higher side**.

Technical Assistance. Advisory TA projects were clustered into five groups: (i) systems planning, (ii) institutional capacity building, (iii) private sector participation, (iv) policy development, and (v) safety. The completed TA projects have met with mixed success because of their inability to mainstream new systems and adopt the resulting recommendations, ineffective follow-up by ADB, and inadequate focus on safety. On the positive side, specific capacity-building contributions were evident in some areas. For example, the development of private sector participation was well supported, and there was more awareness of the need to commercialize. However, road safety, transport regulation, and capacity building in the construction industry needs to be further strengthened.

Performance of ADB

The Government and its development partners have appreciated ADB's assistance to the transport sector. However, the implementation problems have diluted ADB's position as prime development partner. ADB has increased lending in the new millennium, but with no complementary deployment of staff. Government agencies have commented adversely on the quantity and quality of ADB staff. ADB needs to address these staffing issues to achieve the desired development outcomes. Tackling the wider implementation issues that cause delays will require a more comprehensive dialogue with the Government. Issues relating to compliance with environmental and social safeguards, harmonization of procurement procedures, and use of country systems need to be dealt with. Overall, ADB's performance is rated **partly satisfactory**.

ADB's assistance to the transport sector, in general, is rated **partly successful** but on the higher side.

The findings of this evaluation indicate that ADB can continue to be involved in the transport sector if satisfactory measures are taken to learn from past experience to address the problems that have been experienced in the transport portfolio. Continued support to the

national highways, state highways, and rural roads could be directed at lesser developed regions such as the northeastern states. Because of the positive development impacts associated with rural roads, ADB needs to continue to support projects, policies, and institutions. The scope and degree of its involvement across the sector will be determined by the priorities of the Government and the results of the forthcoming country partnership strategy process. The following recommendations are directional and are designed to provide guidance for the formulation of the next India country partnership strategy and future operations in the transport sector.

Recommended Improvements in ADB's Assistance Program and Strategic Positioning

Recommendation	Responsibility	Timing
A. Recommendations for Improving Project Implementation		
1. Implementation Delays. ADB must work more closely with the EAs to identify and resolve problems that lead to implementation delays, both in individual projects and at the strategic level. Specific recommendations for addressing implementation delays are provided in the appendix.	SARD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
2. ADB Supervision. ADB should give at least equal emphasis to good portfolio management and volume of loan approval. ADB's project administration in the transport sector must improve in frequency and quality. This may involve transferring more loan administration responsibilities to ADB's India Resident Mission. Doing so would require the India Resident Mission to be adequately staffed. Alternatively, ADB headquarters staff could interact more closely with the EAs to identify and resolve problems at an early stage.	SARD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
3. ADB Staffing. ADB must find ways to match the number and quality of staff to the increasing level of transport operations and ensure that the staff have adequate and appropriate experience and skills.	SARD and BPMSD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
4. Project Designs. Project design quality at entry must be improved. Project designs must take into account local variations in implementation capabilities and make better use of past experience to improve the design of future projects. In particular, the implementation schedules need to be better estimated.	SARD	From the first Indian transport project loan presented to the Board for approval in 2008.
B. Recommendations for Prioritizing ADB's Strategic Positioning		
5. Support for Private Sector Participation across All Transport Modes. ADB support for policy reforms to promote private sector involvement in the transport sector should continue, at a higher level. Innovative contract arrangements could be developed to maximize the benefits of private sector participation such that it not only replaces public financing but also improves the quality of services. In particular, there are concerns about the long-term sustainability of the NHDP. To address this, ADB should assist the Government in developing an action plan that uses an appropriate mix of public and private funding, e.g., viability gap funding should be encouraged.	SARD and PSOD	During the preparation and implementation of transport sector strategy and road map under the new country partnership strategy.
6. Reassessment of the Approach to Policy Reforms in Indian Railways. The railway policy reform program was formulated in 2002–2003. It is time to review the approach in light of the changed environment and delayed progress. While the basic goals of the	SARD	During the preparation and implementation of transport sector strategy and road map under the

Recommendation	Responsibility	Timing
reform program are robust, the approach to achieving those goals has yet to achieve the desired results. ADB should engage in policy dialogue with the Government and the Indian Railways to rework the reforms agenda and to identify a specific road map for developing further commercial orientation in the operations.		new country partnership strategy.
<p>7. Strengthen Policy Dialogue. ADB should broaden its policy agenda in the transport sector to include a more intensive dialogue on (i) road safety, (ii) sector governance and corruption, (iii) institutional coordination, (iv) mitigate climate change impacts, and (v) achieving socially inclusive objectives. ADB could take steps to work with the Government on developing specific action plans for each of these themes. Road maps, as stated in the country partnership strategy, need to be supplemented with appropriate social parameters. At the same time, there is a need to mainstream these into project designs with specific indicators. ADB could provide specific technical assistance under these broad themes.</p>	SARD	During the preparation and implementation of transport sector strategy and road map under the new country partnership strategy.

ADB = Asian Development Bank; BPMSD = Budget, Personnel, and Management Systems Department; EA = executing agency; NHDP = National Highways Development Program; PSOD = Private Sector Operations Department; SARD = South Asia Department.
Source: Operations Evaluation Mission.

Bruce Murray
Director General
Operations Evaluation Department





I. INTRODUCTION

A. Background and Rationale

1. Good transport infrastructure is part of the enabling environment for rapid, efficient, and sustainable economic growth. India has an extensive and diversified transport system, comprising 3.31 million kilometers (km) of roads, 63,465 km of rail, 12 major and 187 minor ports, 11 major international airports, 89 domestic airports, and 14,500 km of navigable inland waterways. The transport sector in India expanded in the first 50 years after independence, both in spread and in capacity. Along with the increase in quantity, there have been some quality improvements, such as the emergence of a multimodal container transport system, a reduction in the use of obsolete assets, and improvement in the self-financing capacity of the sector. Despite this progress, the Government of India realizes that the country's transport system is far from adequate in service quality, coverage, and capacity. Inadequate transport infrastructure and services are widely believed to be a major constraint on economic development in India.¹

2. Against this background, the Asian Development Bank (ADB) has consistently supported the transport sector in its operations in India. ADB's support has covered roads and highways at the national, state, and rural levels; railways; and ports and inland waterways. Starting with its first road (1988) and railways (1987) loans, ADB's involvement in the transport sector has been extensive—25 public sector loans until end-2006 totaling \$5.28 billion, composing about one-third of ADB's public sector loan portfolio in the country. The road subsector (highways, rural roads) accounts for 75% of the transport sector portfolio. ADB has also provided funding assistance to Indian development finance institutions to help finance private sector infrastructure projects. ADB has approved six private sector facilities linked to the transport sector aggregating \$500 million.

3. ADB's technical assistance (TA) grants for the transport sector amounted to \$34.67 million as of 2006. The 27 advisory technical assistance (ADTA) grants, valued at \$16.99 million, were for sector restructuring, institutional capacity building, system planning, tariff reforms, and asset revaluation. The 31 project preparatory technical assistance (PPTA) grants, totaling \$17.67 million, supported project formulation for national and state highways, rural roads, ports, and inland waterways (for details see Appendix 1).

B. Objective, Scope, and Methodology

4. The objective of this sector assistance program evaluation (the evaluation) is to provide an independent assessment of ADB's assistance to the Indian transport sector and to identify issues and areas where ADB, the Government, the private sector, and other stakeholders could work together more effectively to improve the effectiveness of their interventions and to achieve development results. This evaluation focuses on road² and railway operations.³ Urban transport and urban roads have traditionally been categorized under urban sector development within ADB, rather than under the transport sector; they were covered by a separate evaluation.⁴

5. The evaluation examined all transport sector loans and ADTA projects over the period 1987–2005 (Appendix 1). Projects approved after December 2005 were not covered in detail as

¹ ADB. 2005. *Economic Bulletin*. Volume III, No. 3. India Resident Mission. New Delhi; and World Bank. 2006. *Transport Strategy Brief from South Asia Region*. Washington, DC.

² The roads subsector comprises road and highway projects, i.e., national, state, district roads, and rural roads.

³ The ports and inland waterways subsectors were reviewed briefly during the evaluation (see Appendix 2 for details).

⁴ ADB. 2006. *Special Evaluation Study on Urban Sector Strategy and Operations*. Manila.

these are in the very early stages of implementation. Besides its own assessment of TA projects, the evaluation drew on the separate evaluation of selected PPTA projects by the Operations Evaluation Department.

6. In evaluating the completed projects, the Operations Evaluation Mission (OEM) relied on postevaluation reports, desk study, and site visits,⁵ as well as discussions with officials of ADB and the Government. Since construction work on most of the projects began in the early 1990s, institutional memory and the availability of project information had limitations. The projects, in various parts of the country (Maps 1 and 2), were difficult to access for field observations within the limited time available for the evaluation.⁶ The evaluation also drew on project completion reports and internal project documents. The findings of the relevant project completion reports were validated through desk research. The evaluation broadly followed ADB's guidelines for country assistance program evaluation.⁷ A bottom-up evaluation of lending and nonlending programs (mainly ADTA projects) examined their relevance, effectiveness, efficiency, sustainability, and impact. The top-down evaluation examined the strategic performance of individual sectors and looked at ADB's sector strategy and positioning, ADB's contribution to development results (ADB's value added and long-term impacts, including policy, institutional, and behavioral changes that would reduce poverty and lead to economic growth), and ADB's performance (including responsiveness to client needs, quality of services, contribution to country strategy, adherence to sector governance, promotion of client ownership, and donor coordination). The evaluation was based on perception surveys and related reports. Appendix 3 gives more details of the approach, methodology, and framework of the evaluation.

7. The evaluation had several limitations. First, only 31% of the projects have been completed; 69% are in various stages of implementation.⁸ Thus, some of the analysis reflects expectations about future outcomes, and any attempt to look into the future always involve uncertainty. Second, since the projects are geographically dispersed, not all could be visited to gain first-hand information. Hence, the OEM examined a sample of projects. Third, it is difficult to separate out the performance of ADB-financed projects from the performance of transport sector projects in general. While implementation issues can be identified, the achievement of outcomes and impacts is usually blurred by the presence of other interventions, which influenced the results achieved.

C. Organization of the Report

8. Chapter II gives an overview of the transport sector and the Government's program. This is followed by an analysis of ADB's positioning and strategy for the road and railway subsectors in chapter III, which also reviews the collaboration with other development partners. Chapter IV assesses the project implementation and operations of both completed and ongoing projects, and evaluates ADB's TA projects in the transport sector. Chapter V assesses the performance of the sector as against the evaluation parameters. Chapter VI evaluates the quality at entry and the institutional performance in relation to ADB's assistance projects. Chapter VII provides an overall assessment of the sector. Finally, chapter VIII summarizes the main issues faced by the sector in general and ADB's projects in particular and identifies several recommendations.

⁵ Due to limited time and resources, as well as security concerns in some parts of the country, the OEM visited only a small sample of project sites.

⁶ ADB. 2007. *Special Evaluation Study on the Performance of Technical Assistance*. Manila.

⁷ ADB. 2006. *Guidelines for the Preparation of Country Assistance Program Evaluation Reports*. Manila. Available: <http://www.adb.org/Documents/Guidelines/Country-Assistance-Program/guide-peparation-0206.pdf>

⁸ Out of the \$4.1 billion roads and railway portfolio, completed projects amounted to \$1.3 billion as of December 2006.

II. THE TRANSPORT SECTOR IN INDIA

A. Overview

9. Three quarters of India's population lives in rural villages. In 2000, 330,000 out of 825,000 villages and habitations were without all-weather road access. The majority of the poorly connected rural communities are in 10 states—Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh, and West Bengal.⁹ These states are among the poorer states in India. In 2003–2004, per capita income in these states averaged \$180, compared to \$262 for the country. Economic growth and structural shifts in the economy have increased the demand for infrastructure, especially transport, over the last decade. A profile of the transport sector is in Appendix 4.

10. Transport demand is driven primarily by population and economic growth. From 1987 to 2005, the population grew at an average rate of 2.3% yearly. Urbanization is increasing as more people move to India's urban areas in search of employment opportunities. Real gross domestic product (GDP) growth since 1990 has been consistently high, averaging 5.8% yearly. The contribution of the transport sector to the economy is higher than the proportion of the expenditure being used to improve and maintain the sector. In FY2002, the road sector accounted for slightly less than 3% of total government expenditure and contributed about 15.5% of revenues. Thus, the road sector generated a large fiscal surplus.¹⁰ The share of the transport sector in total GDP increased from 5.7% in 1999–2000 to 6.4% in 2004–2005. However, the share of the transport sector in public expenditure increased only from 3.2% to 4.2% during the same period, indicating the inadequacy of public spending.

11. **Roads.** Road transport is the dominant mode, accounting for 65% of freight movement and 80% of passenger traffic;¹¹ rail transport accounts for much of the rest. The road network is divided into three categories: (i) the primary system of national highways, serving interstate long-distance traffic; (ii) the secondary system, consisting of state highways and major district roads carrying mainly intrastate traffic; and (iii) the tertiary system, comprising other district roads and rural roads.

12. The national highway, with a total length of 66,590 km, serves as the arterial network connecting metropolitan centers and major cities. This constitutes less than 2% of the road network but carries more than 40% of the total traffic volume. The development of national highways has been accorded high priority in planning, and an ambitious road building plan has been drawn up. Limited public sector financial resources are a major constraint, necessitating the development of projects through public-private partnerships (PPPs). The district and rural roads provide much needed accessibility in meeting local, economic, and social needs; transporting agricultural produce and inputs to markets; and using health and educational services.

13. Rapid economic growth and changes in the structure of the economy have created a growing demand for all transport services (Appendix 4). The demand for road transport has increased faster than the demand for other modes. Future demand is expected to be strong,

⁹ National Rural Roads Development Agency (Ministry of Rural Development) Government of India. *Pradhan Mantri Gram Sadak Yojana Operations Manual*.

¹⁰ Source: World Bank. 2004. *Highway Sector Financing in India, A Policy Note*. Washington, DC.

¹¹ Source: National Highways Authority of India, www.nhai.org

growing at 1.5 times the economic growth rate for freight and two times the economic growth rate for passenger traffic.¹² The Operations Evaluation Department findings suggest that strong demand for transport services is a key contributor to the success of ADB-financed road projects in the Asia and Pacific region.¹³

14. The economic growth and rising incomes over the last 2 decades have resulted in rapidly growing vehicle ownership. The increasing vehicle ownership, in turn, is a key factor underlying the rapid traffic growth. Freight traffic increased by 138 times between 1950 and 2004, while passenger traffic increased by 167 times.¹⁴ Not surprisingly, congestion has increased on roads, a factor that contributes to longer journey times, higher vehicle operating costs, higher vehicle emissions, and more traffic accidents.¹⁵ Passenger traffic is forecast to grow annually at 12–15% for the next 5 years and for freight traffic at 15–18% (footnote 12). This rate will create an increased demand for more and better road infrastructure.

15. **Railways.** The Indian Railways owns and operates one of the largest rail networks in the world, covering more than 63,140 route km. Passenger traffic, in terms of passenger-km carried, increased from 66 billion in 1950–1951 to 541 billion in 2004–2005 (average annual growth rate of 4%), while freight traffic (in terms of net ton-km) increased from 44 billion to 384 billion during the same period (average annual growth rate of 4%). However, Indian Railways has been unable to compete consistently with other modes of traffic. During the last 5 decades, the share of railways in the freight traffic market fell from 89% to around 40%, and its share in the passenger traffic market dropped from 80% to 20%.¹⁶ In 2005, the performance of the Indian Railways improved with financial net revenues increasing from \$1.4 billion in 2004–2005 to \$1.76 billion in 2005–2006. This enabled the Indian Railways to consider investing in capacity enhancement in a more positive manner. The Indian Railway's recent turnaround is seen in the 10.1% rise in revenue earning freight traffic in 2006.¹⁷

B. Institutional Structure

16. Responsibilities for the transport system in India are divided between the central and state governments. In broad terms, the central Government is responsible for railways, national highways, major ports and international shipping, civil aviation, and national inland waterways. State governments are responsible for state and rural roads, minor ports and coastal shipping, inland water transport, urban transport, and trucking and intercity bus services. This division of responsibilities is not absolute—the central Government also plays a role in coastal shipping, motor vehicle transport, and urban transport, mainly through policy, regulations, and funding support.

¹² Committee on Infrastructure. Available: <http://www.infrastructure.gov.in>

¹³ ADB. 2006. *2006 Annual Evaluation Review*. Manila.

¹⁴ Source: CRISIL Research and Information Services Limited (CRIS INFAC). 2005. *Roads and Highways*. Available: <http://www.crisinfac.com>

¹⁵ CRIS INFAC estimates the average daily traffic volume on the national highways network to be more than 39,000 passenger car units of motorized and nonmotorized traffic. This exceeds by far the capacity of 15,000 passenger car units of two lane highways. Thirty-two percent of the national and state highways are two-lane, while more than two-thirds are still single-lane roads. The congestion levels are proportionately higher on the single-lane roads, causing major safety issues (Source: see footnote 14).

¹⁶ Mukherjee, A., and R. Sachdeva. 2004. *Trade in Land Transport Services: Railways*. ICRIER Working Paper 119. New Delhi.

¹⁷ National Accounts, Ministry of Statistics and Program Implementation. Available: <http://mospi.nic.in/t1.htm>

17. The responsibility for each mode resides in a mode-specific ministry within the central Government.¹⁸ Interaction among these modal agencies is limited, and each agency works within its own area without full knowledge of its impact on the others. The allocation of responsibilities is more complicated at the state level. State highways are built and maintained by the public works department (PWD), and rural roads by the PWD or local government engineering department. Traffic rules and enforcement are the responsibility of traffic police; and road vehicle registration, permit issuance, and other road transport regulations are the responsibilities of the transport department. Institutional arrangements for urban transport are more complicated, with many agencies being involved, but none having overall responsibility. Weak coordination among the large number of agencies active in the transport sector creates inefficiencies that restrict intermodal transport planning and sector management.

C. Transport Plans and Programs

18. The Planning Commission recognized the inadequacies and imbalances in the Indian transport system in preparing the 9th Five-Year Plan (FYP) (1997–2002),¹⁹ which included a comprehensive package of measures for addressing various issues in the transport sector. The 9th FYP emphasized the need to improve the capacity and quality of the transportation system through technological upgrading and the development of a rational tariff and investment policy to remove distortions in the intermodal mix. Although progress in roads and ports was adequate during this 9th FYP, shortfalls occurred in the achievement of their physical and financial targets as well as policy objectives of the railways. The 10th FYP (2002–2007)²⁰ was designed to provide a framework for the long-term development of the transport sector and a focus on intermodal complementarities and competitiveness. The inadequate maintenance of assets across all transport modes was recognized as pervasive. The 10th FYP noted that although the Indian road network is extensive, only about half of the roads are paved and only 20% of paved roads are in good condition.²¹ The focus was on rehabilitation and widening of roads to ensure all-weather operations. Appendix 4 gives more details of the 10th FYP.

19. The Planning Commission's draft approach paper for the 11th FYP (2008–2011) recognizes the enormous cost of developing the national highways estimated at \$48.4 billion. The focus in the earlier plan on the development of national highways and rural roads will continue, but emphasis is likely to be given to the development of state highways and district roads to ensure integrated development. The need for reforms to modernize the railways and improve its services has been highlighted. While the public sector has been identified as a source of funding, the approach paper views PPPs as a way to reduce the burden on the government budget. Further details are found in Appendix 4.

20. **Roads.** For a country of India's size, an efficient road network is necessary both for national integration and socioeconomic development. Because of the increasing demand for road transport, the Government initiated the National Highways Development Program (NHDP) in 1998 (Table 1). This program has the overall goal of improving the national highway network in a phased manner (Appendix 4). The 5,846 km Golden Quadrilateral connecting the major metropolises of Chennai, Delhi, Kolkata, and Mumbai was expected to be completed by

¹⁸ There are five central mode specific ministries—Ministry of Shipping, Road Transport, and Highways; Ministry of Civil Aviation; Ministry of Railways; Ministry of Rural Development; and Ministry of Urban Development.

¹⁹ Planning Commission. *Ninth Five-Year Plan (1997–2002)*. New Delhi.

²⁰ Planning Commission. *Tenth Five-Year Plan (2002–2007)*. New Delhi.

²¹ The average productivity of a truck in 2002 was only 200 km/day compared with a potential of 350–400 km/day with improvements in road conditions and reductions in traffic congestion.

December 2006 but has been delayed (Map 1). The 7,300 km North-South and East-West corridors are to be completed by December 2009.

Table 1: Cost and Completion Status of NHDP Phases

Phase/ Segment	Description	Length (km)	Cost (\$ million)	Extent of Completion (as of September 2006) (%)
NHDP-I	Golden Quadrilateral (GQ)	5,846	6,933	93
NHDP-II	North-South/East-West corridors	7,300	7,555	12
NHDP-III	Four-laning of important sections	10,000	14,343	<1
NHDP-IV	Two-laning	20,000	6,116	0
NHDP-V	Six-laning of the GQ	6,500	9,066	0
NHDP-VI	Expressways	1,000	3,670	0
NHDP-VII	Bypasses, ring roads, etc.	To be firm'd up	3,670	0
Total		50,646	51,353	

km = kilometer, NHDP = National Highways Development Program.

Sources: Planning Commission. 2006. *Towards Faster and More Inclusive Growth: An Approach to the 11th Five-Year Plan*. New Delhi (final); and National Highways Authority of India.

21. The Government's programs in the last decade have focused on improving the capacity of the national network, and have placed less emphasis on developing the state highways. There is increasing awareness that the state governments need to give more importance to rehabilitation and maintenance activities and to allocate more funds for road development. Limited funding remains a fundamental issue. The state PWDs also lack adequate capacity to plan a rehabilitation and maintenance program. To address the funding issue, the Government allocated \$3.32 billion for the 12th Finance Commission,²² which distributes national revenues among the states.

22. The Prime Minister's Rural Road Program (*Pradhan Mantri Gram Sadak Yojana* [PMGSY]) was launched in October 2000 to improve connectivity by building all-weather roads to the unconnected communities in the rural areas. The goal was to cover about 50,782 habitations with a population of 1,000 and above in 3 years (2000–2003). Thereafter, all unconnected communities with a population of 500 persons and above were to be covered by the end of 2007. For the hill states and the desert areas, the objective was to connect communities with a population of 250 persons or more.²³ This program was conceived as a centrally-sponsored scheme in its entirety with support from international development partners, including ADB. However, implementation has been slow, and the program has fallen short of its targets. The progress in length of roads completed was less than 23% of the target by the end of 2003. By the end of 2006, just 30% of the target had been achieved. To address these delays and to provide a more focused approach, the Bharat Nirman Program was launched in 2005. This was to provide road connectivity to 38,484 villages with populations of 1,000 and above, and to 20,867 habitations with populations of 500 and above in the hilly and tribal areas. This program also has other infrastructure components related to telephones, electricity, irrigation, water supply, and housing.

23. **Railways.** To improve its freight services, Indian Railways has recently begun building dedicated freight corridors running parallel to the existing network between Delhi and Mumbai

²² For expenditures during the period 2006–2007 to 2009–2010.

²³ The hill states included North-East, Sikkim, Himachal Pradesh, Jammu and Kashmir, and Uttaranchal. The desert areas included Rajasthan.

on the western side, and between Delhi and Kolkata on the eastern side. Totalling about 10,000 km, these dedicated freight corridors are likely to cost more than \$15.4 billion and will be implemented over the next decade. The scale of these corridors is massive, requiring the resolution of contractual, operational, technical, financial, environmental, and land acquisition issues. ADB has been working closely with the Government and other development partners, particularly Japan, to support this initiative.

D. Private Sector Participation

24. The recognition by the Government that the transport sector needs to be self-financing as far as possible has been taken up by the transport agencies in various ways. An improved enabling environment for the private sector has facilitated the flow of private investments into planned programs for expanding system capacities, reducing bottlenecks, and satisfying user demand. The most advanced private sector participation programs are in the highway and port sectors, with the rail private sector participation beginning to progress as part of several recent initiatives.

25. ADB has supported private sector participation by providing TA to the National Highways Authority of India (NHAI) and funding assistance to private or semigovernment organizations like the Industrial Finance Corporation of India, Infrastructure Leasing and Financial Services, and Industrial Development Bank of India for onlending to the private sector. These loans have financed some transport sector projects. A recent evaluation²⁴ raised a combination of project design and implementation issues similar to those for public sector projects (Box 1).

Box 1: Findings of Evaluation of Private Sector Infrastructure Facility

There has been a positive response from the private sector (largely domestic) to National Highways Authority of India projects, although the progress of the projects varies from state to state. The completed Asian Development Bank-financed projects have brought out several issues: (i) lack of realistic traffic assessment, resulting in a traffic risk that is being borne by private developers; (ii) delay in land acquisition, resulting in implementation delays; (iii) resistance to tolls; (iv) need to structure and select the right model of public-private partnership; (v) limited domestic capacity to cope with the huge requirement for private sector participation; (vi) limited interest shown by international developers and investors; and (vii) lack of innovative financing structures that suit the requirement and revenue profiles of public-private partnerships in the road subsector.

Source: Asian Development Bank.

26. **Roads.** ADB TA to NHAI has supported various forms of private sector participation for NHDP I and II revolving around the build-operate-transfer (BOT) concept. NHAI uses two basic forms of BOT:

- (i) **Toll-based contract.** The concessionaire builds and maintains the project road, and generates revenues from vehicle tolls during the concession period of 20–30 years. The concessionaire also assumes the traffic risk.
- (ii) **Annuity-based contract.** The concessionaire builds and maintains the project road, and is paid a semiannual charge by NHAI, which assumes the traffic risk.

²⁴ ADB. 2006. *Project Performance Evaluation Report on India: Private Sector Infrastructure Facility*. Manila.

27. NHAI is proceeding on the assumption that the projects under NHDP III (10,000 km) and 25% of the projects under NHDP IV (5,000 km) will be developed on a BOT toll basis, and 75% of NHDP IV projects will use BOT annuity contracts. These plans still have to be approved by the Government. BOT toll contracts are planned for phases V–VII. The Indian financial sector is supportive of the NHDP and confident in NHAI's ability to develop the projects and manage the large projects and consortia involved. A combination of factors, including the lack of familiarity of both NHAI and private sector participants with the BOT concept, led to some problems in the early BOT projects. Costly lessons have been learned.²⁵

28. An updated Model Concession Agreement to facilitate private sector participation with industry stakeholders in the NHDP is being developed by NHAI and is expected to be completed in 2007. A total of 43 new BOT projects across phases I–III have been awarded by the Ministry of Shipping, Road Transport, and Highways. Clearly, NHAI has made significant progress in improving the enabling environment for the private sector in the road subsector. Other countries could learn from this successful experience since, worldwide, there has been limited success in attracting private capital into the road sector.

29. Since not all the road projects are financially viable, NHAI intends to provide viability gap funding, which will be limited to compensating for the revenue shortfall between the expected and the actual rate of return of a project. The time and amount of the grant disbursement (up to 40% of the capital cost) will vary from project to project. For the first round of projects, the available funding from the road cess²⁶ should be sufficient. The 40% limit, however, might not attract adequate private sector participation in remote areas. Projects in such areas will require a combination of public sector financing and support from development partners.

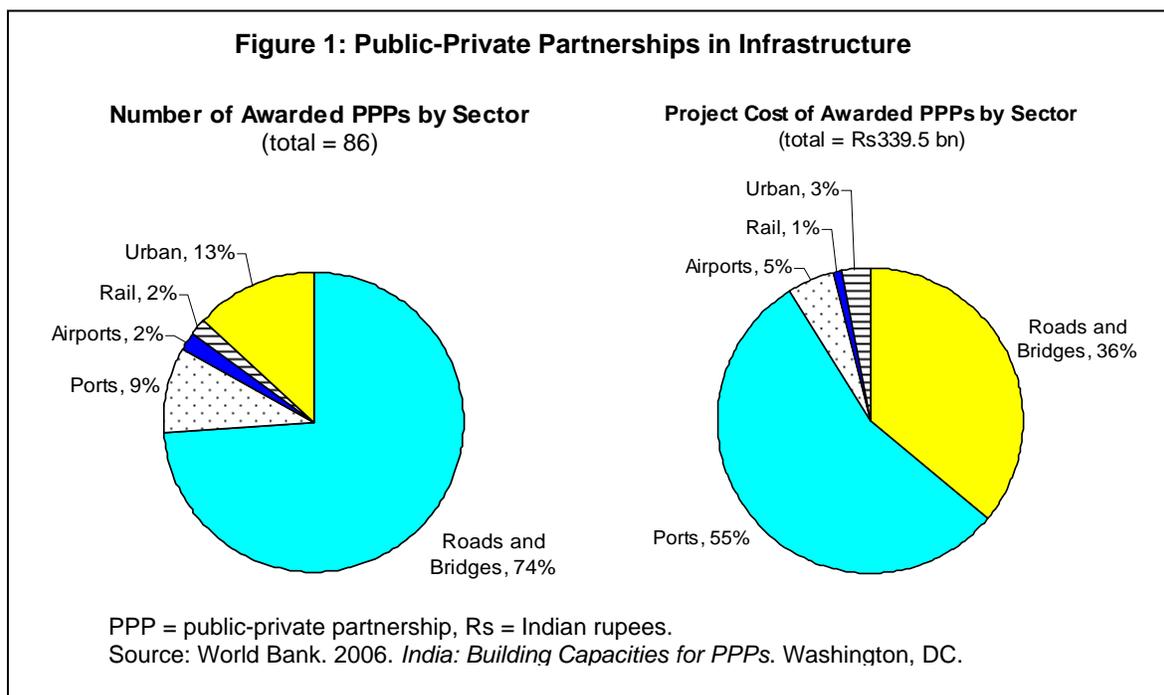
30. In the states, private sector participation is the vehicle of choice for the Maharashtra State Road Development Corporation and Madhya Pradesh Road Development Corporation. Both have attracted private sector participants in BOT annuity projects, as well as toll projects for state highways with generally successful results. In remote areas (e.g., in Chhattisgarh), roads are not financially viable since the traffic flows are low and risks are high for private sector investors. The OEM visited an operational bridge (BOT toll), a state highway under construction (BOT toll), and an urban bypass (early BOT annuity) in Maharashtra. At the bridge site, the OEM observed relatively low total traffic flows, but a high percentage of trucks, thereby making the BOT scheme viable since the tolls for trucks are considerably higher than those for passenger cars. Both the bridge and approach roads appeared to be well managed and maintained; the BOT operator was using computer technology and cameras to monitor toll collections, thereby ensuring the accuracy of the charges levied on users, and reducing the possibility of corruption through revenue leakage. The involvement of the private sector has enabled efficient management of the project after completion—although not in the case of a project in Chhattisgarh. Despite private sector responsibility for the rehabilitation and maintenance of state roads, the pavement was found to be of inferior quality.

31. Figure 1 shows the PPP contracts across the various subsectors as of the end of 2006. India's experience has been somewhat different from that of the rest of the world. Private sector investment in the transport sector outside India has gone into sea ports and airports but hardly

²⁵ For example, outdated detailed project reports, several design changes, delayed government clearances, land acquisition, and contractor problems affected the construction of the NH8 between Delhi and Gurgaon, adding significantly to the cost and construction delays, besides causing congestion in this highly used corridor. Zadoo, V. 2007. *On a Slow Lane*. Available: <http://www.businessworld.in>

²⁶ The road cess is a tax being levied on petrol and diesel sales.

into roads and railways. India, in contrast, has clearly succeeded in attracting private sector investment in both roads and ports.



32. **Railways.** Private sector involvement in railways has been limited. The Indian Railways has taken several steps, with varying degrees of success, to involve the private sector in the development of railway infrastructure and services, including the “own-your-own-wagon” and “build-own-lease transfer” schemes. Under the former scheme, private sector firms were expected to procure their own wagons and lease them to the Indian Railways on a charge-out basis. The scheme was conceived to enhance the capacity of railway transport and to meet the interests of the various sections of the economy by encouraging private parties to own their wagons and supplement the resources of the railways for the acquisition of rolling stock. The response was quite encouraging in the 1990s, but interest has since waned and the scheme has been replaced by the wagon investment scheme (Appendix 4). The build-own-lease-transfer program was designed to bridge the gap between the Indian Railways system requirements and available funds by inviting private sector financiers to participate in the development of rail infrastructure, including electrification, gauge conversion, and doubling of railway line projects. The program did not succeed in attracting the private sector since the projects faced higher risks of time and cost overruns, and there were no tax incentives for the infrastructure developer.

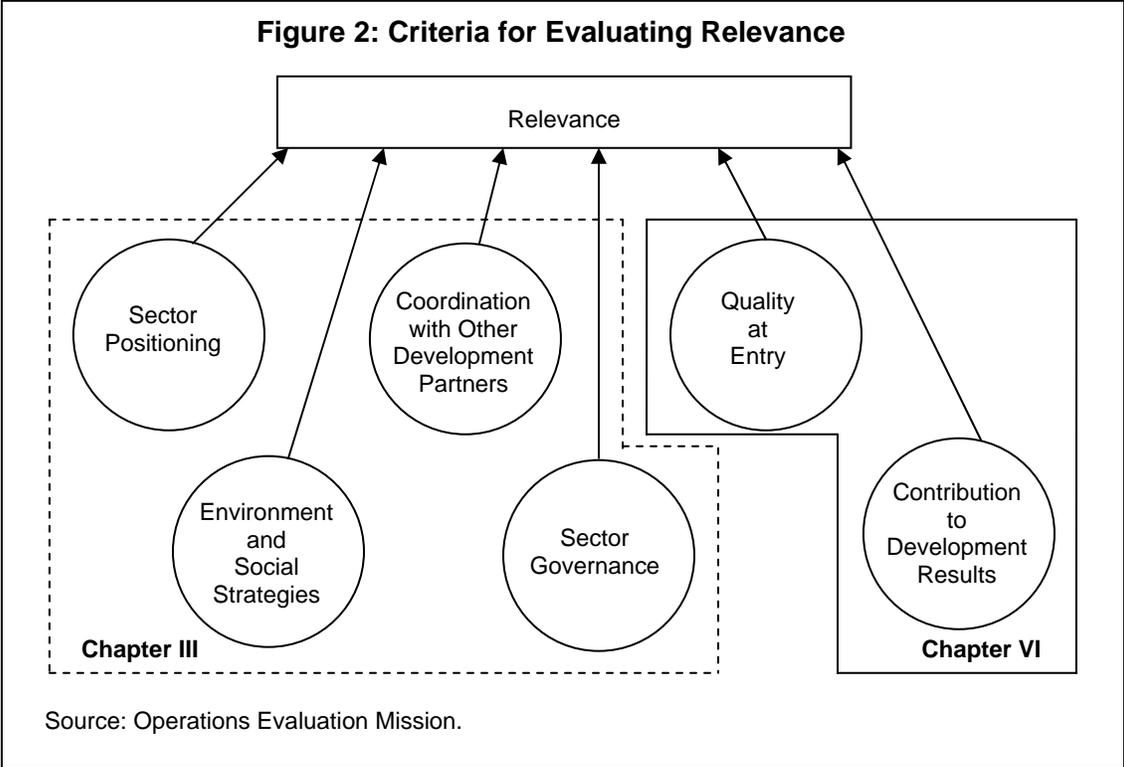
33. Consistent with experience worldwide, private sector participation in the railway subsector in India has yet to gain popularity. The Indian Railways has recently identified the major obstacles to private sector involvement and defined the objectives of such participation more clearly. It plans to use a number of models to enhance its capacity and improve its services: (i) a special-purpose vehicle, involving various stakeholders, including state governments; (ii) BOT; (iii) private freight terminals; and (iv) wagon investment scheme. To date, ADB has had little involvement in assisting the Indian Railways in developing its private sector strategy. However, under the TA on Management Consulting Services to Indian Railways, there may be opportunities to add some value in this area. Appendix 4 gives details of these plans.

E. Regional Economic Cooperation

34. Transport is an important element of many regional economic cooperation initiatives involving India. In 1996, four members of the South Asian Association for Regional Cooperation—Bangladesh, Bhutan, India, and Nepal—formed the South Asian Growth Quadrangle, an economic cooperation initiative supported and facilitated by the South Asia Subregional Economic Cooperation program, which was launched in 2001 with ADB assistance. This program, supported through a series of TA projects, provides a forum for the four countries to discuss, identify, and prioritize subregional cooperation projects in six sectors: transport; energy and power; environment; information and communications technology; tourism, trade, and investment; and private sector cooperation. These efforts, however, have not yet led to any investment projects for subregional transport development. Appendix 4 elaborates on the potential for regional cooperation in the transport sector in South Asia.

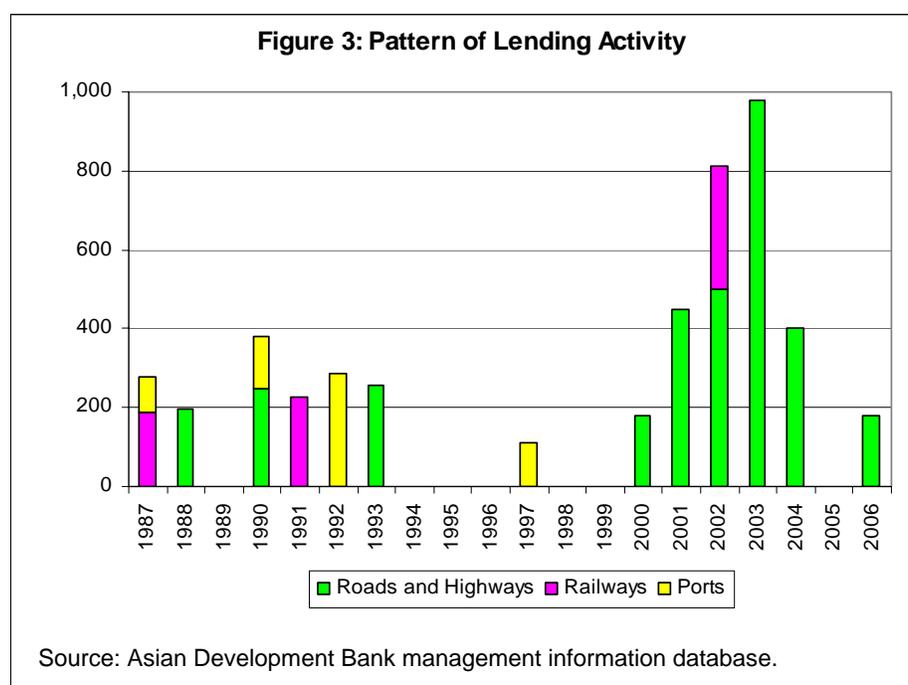
III. ADB’S STRATEGIES FOR THE ROAD AND RAILWAY SUBSECTORS

35. This chapter analyzes the relevance of ADB’s strategies in the context of the development challenges facing the Indian transport sector. It uses several criteria to evaluate the positioning, responsiveness, coherence, comprehensiveness, and harmonization of ADB’s sector assistance program (Figure 2). The evolution of ADB’s transport strategy in India and the appropriateness of its positioning, safeguard strategies, sector governance, and coordination with other development partners are discussed in this chapter. The other top-down indicators—quality at entry and contribution to development results—are discussed in chapter VI.



A. Evolution of the Strategy and Sector Positioning

36. Figure 3 shows the pattern of ADB transport lending since 1987. The road and highway subsector has consistently dominated ADB's portfolio. Railway and port projects have been financed intermittently, and ADB has not been involved in airports in India. ADB's activities in the transport sector dwindled in the mid-1990s²⁷ as (i) the institution structure of road subsector changed with the establishment of the NHAI and experienced transition in the early and mid-1990s; (ii) international assistance to the railways ceased for a period due to a lack of progress in implementing reforms; (iii) the increased potential for private sector participation prompted ADB and other development partners to exit from ports subsector in the late 1990s; and (iv) India's nuclear test in May 1998, and the subsequent imposition of economic sanctions by international donors, brought about a temporary suspension of ADB's assistance.²⁸ Transport sector lending increased after 2000 following the renewed focus on infrastructure development in the country strategy and program.



37. ADB's lending in the transport sector can be divided into three stages (Table 2). In the first stage, ADB gained an understanding of operations in the Indian transport sector, and executing agencies learned about ADB's policies and procedures. From 1987 to the mid-1990s, ADB extended three highway loans²⁹ (for improvements in national and state highways in

²⁷ In the transport sector, only one project, a port project, was approved between 1992 and 1999.

²⁸ Foreign aid to India was reduced to \$1.8 billion in 1999 from \$3.7 billion in 1998.

²⁹ ADB. 1988. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to India for the Road Improvement Project*. Manila (Loan 918-IND, for \$198 million, approved on 10 November); ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to India for the Second Road Project*. Manila (Loan 1041-IND, for \$250 million, approved on 30 October); and ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the National Highways Project*. Manila (Loan 1274-IND, for \$245 million, approved on 29 November).

several states), two railway loans³⁰ (for operating improvements and new locomotive power), and three port loans³¹ (for physical improvements at major ports). This assistance was in line with the 1990 operational strategy for India, which focused on physical rehabilitation and maintenance of assets. Because of the institutional transition for roads, the initial focus was more on railways and ports. The strategy for roads placed priority on rehabilitating national and state highways. For lack of a clear geographic focus, the road, port, and railway projects were spread all over the country. ADB was establishing itself in the country, and its initial aim was modest: to make more efficient use of existing capacity by rehabilitating it, rather than building new capacity. As time went on, however, there was growing awareness of the need for policy dialogue to initiate reforms. The World Bank and International Monetary Fund took the lead in this area, and ADB followed. This was appropriate, given those institutions' long history of involvement and the fact that ADB had started to lend to India only in 1987. Although the strategy for railways included upgrading high-freight routes, ADB completed only one such project. Overall, ADB's entry into the transport sector was cautious, and was aimed at developing an understanding of the subsectors. Table 2 describes and assesses the evolution of ADB's strategies.

Table 2: Transport Sector Priorities and Positioning

Time Period	Sector Constraints and Needs Identified in Five-Year Plans	ADB's Strategy	Assessment
Late 1980s to mid-1990s	<ul style="list-style-type: none"> • Industrial development and export bottlenecks • Limited emphasis on infrastructure development • Inadequate road maintenance • Operating inefficiencies in the railway subsector; tariffs needed to be rationalized (mainly, freight tariffs had to be increased) and capacity expansion • Crucial need for reforms in port subsector to improve operating efficiency and address policy deficiencies 	<ul style="list-style-type: none"> • Guided by the 1988 operational program and 1990 operational strategy • Limited policy dialogue • Focus on capacity improvement to support the industrial sector (ports and transport) • Lending to ports, rail, and road subsectors to support industrial development; the focus was on rehabilitating national highways and not rural roads 	<ul style="list-style-type: none"> • Policy dialogue during this period was handled by World Bank/IMF, with ADB following their lead • There was growing awareness of the need for institutional reforms in the Government to support infrastructure development • Although the transport sector dominated the lending, ADB did not have any specific long-term strategy with sector projects dispersed widely over the country
Late 1990s–2000	<ul style="list-style-type: none"> • After major economic reforms, crucial need for deregulation and private sector participation • Need to develop national high- 	<ul style="list-style-type: none"> • Guided by the 1996 operational strategy • Limited volume of lending, despite recognition of need to 	<ul style="list-style-type: none"> • With the focus on infrastructure, ADB generally followed national priorities and supported

³⁰ ADB. 1987. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Railways Project*. Manila (Loan 857-IND, for \$190 million, approved on 10 November); and ADB. 1991. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance to India for the Second Railways Project*. Manila (Loan 1140-IND, for \$225 million, approved on 5 December).

³¹ ADB. 1987. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Ports Development Project*. Manila (Loan 842-IND, for \$87.6 million, approved on 24 September); ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to India for the Second Roads Project*. Manila (Loan 1016-IND, for \$129 million, approved on 29 March); and ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance to India for the Coal Ports Project*. Manila (Loan 1181-IND, for \$285 million, approved on 27 October).

Time Period	Sector Constraints and Needs Identified in Five-Year Plans	ADB's Strategy	Assessment
	<p>density corridors to meet the growing demand</p> <ul style="list-style-type: none"> • Initial road and rail private sector participations and preliminary policy development • Need for continued emphasis on capacity improvement with private sector participation • Limited emphasis on multimodal infrastructure development 	<p>develop high-density corridors</p> <ul style="list-style-type: none"> • With road subsector in transition, ADB followed the Government's lead in encouraging private sector investment; the development of NHAI and new contracting structures were steps in this direction • With increased private sector activity in major ports, ADB took steps to shift its focus to minor ports, but without a clear policy, there was a lull in the activities • Support extended to states to deepen the reform process, although no specific strategy was identified 	<p>reforms with appropriate technical assistance</p> <ul style="list-style-type: none"> • With increased private sector activity in ports, ADB appropriately shifted its focus to roads • ADB became less active in railways because the Indian Railways was reluctant to implement significant structural reforms; however, things changed later in this period
From 2001	<ul style="list-style-type: none"> • In the transport sector, continued ADB focus on private sector participation, although ADB-supported policy reforms acquired a new overall focus with the mainstreaming of poverty reduction • Shortage of transport infrastructure across all subsectors and growing demand for more and better-quality services • Emphasis on importance of rural investments • The recognition that the private sector could bring not just capital but also more efficient operations defined contractual arrangements • Need for adequate competition and regulation to complement the encouraging response of the private sector in road projects 	<ul style="list-style-type: none"> • Guided by the 1999–2003 assistance plans and 2003 country strategy • Major focus on increasing transport lending resulted in many projects, mainly road projects • Physical investments were combined with policy reforms and capacity building • Rail lending resumed with an agreed reform agenda • More focus on social and environmental safeguards • Programmatic approach, with new interventions triggered by the achievement of agreed milestones • Specific activities in the states identified, although the practical aspects of implementing reforms were unclear • Tentative move into the inland waterway subsector—a step toward multimodal transport 	<ul style="list-style-type: none"> • The rapid increase in loan approvals adversely affected the quality at entry of projects, which were poorly designed^a and inadequately administered • ADB's program responded to the needs of the sector and followed the Government's priorities in project selection • Entry into the state road subsector supported national programs • Identification of Madhya Pradesh and Chhattisgarh as focal states was relevant given their relatively high level of poverty, but the continued capacity and commitment to reforms was uncertain • The venture into inland waterways has since faltered resulting in ADB's exit (Appendix 2)

ADB = Asian Development Bank, IMF = International Monetary Fund, NHAI = National Highways Authority of India.

^a Design issues included unrealistic scheduling, challenging and unrealistic reforms, and impractical project selection criteria.

Source: Operations Evaluation Mission.

38. In the second stage, from the late 1990s to 2001, ADB focused on addressing the implementation problems in ongoing projects. The 1996 operational strategy was expanded to include policy reform components, especially for roads and highways, but these reforms were limited to the institutional development activities needed to focus on the development of national highways and to promote private sector participation. One of the most important changes during this period was the establishment in 1995 of the NHAI, which supported the next series of ADB lending

to the Indian highway subsector. However, this assistance materialized only in 2000. The late 1990s saw the approval of just one port project,³² reflecting the state of transition in the transport sector and the impact of the freeze on new lending following the nuclear test. ADB opted to watch and wait until the necessary institutional structures were put in place. Although a geographic focus was emerging in other sectors like energy, the transport sector strategy continued to be driven by umbrella-type projects that did not engage directly with the state governments. In the absence of progress in the policy dialogue in the railway, ADB shifted its focus to roads and highways.

39. In the third stage, from 2001, ADB supported the reform of transport sector policies and institutions through five loans to NHAI,³³ one loan each in West Bengal,³⁴ and the Madhya Pradesh government³⁵ and railways. The 2003 ADB lending pipeline included 12 transport loans for 2003–2006. This stage saw a rapid increase in the size and coverage of ADB assistance. There was a move into new subsectors (e.g., state highways, rural roads). The move to support state road projects directly was an important step in this strategy. So was the increase in the size of loans, from \$250 million in 1990 for the second road project to \$400 million in 2004 for the rural roads program. Combining physical investments with policy reforms and capacity building in all the projects was a major transformation in ADB's operations in the transport sector.

40. In the new millennium, for the first time ADB developed a strategic approach for national highways. The programmatic approach adopted was aimed at (i) supporting policy reforms in the transport sector, (ii) introducing innovations in project design, and (iii) leveraging ADB assistance through nonlending activities (TA projects). The reform actions were grouped under (i) institutional restructuring and development, (ii) highway funding, (iii) project implementation, and (iv) private sector participation. Future activities were to be designed as the milestones related to the above themes were achieved. This was a positive development, designed to contribute to the achievement of strategic development results in the future.

41. Starting with the 2001 Western Transport Corridor Project, ADB adopted this programmatic approach to designing loan projects. ADB, the Government, and NHAI agreed that policy reform had to be placed within a broader thematic framework to meet the needs of the public for increased mobility and of the economy for efficient cargo movement more rapidly than was possible through the project-by-project approach pursued up to that point. Although this new approach was relevant in the first few years, recent project designs indicate that ADB has basically followed the

³² ADB. 1997. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and Technical Assistance Grant to India for the Mumbai Port Trust and Chennai Port Trust Project*. Manila (Loans 1556/1557-IND, for \$113 million, approved on 29 September).

³³ ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the National Highways Authority of India for the Surat-Manor Tollway Project in India*. Manila (Loan 1747-IND, for \$180 million, approved on 27 July); ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Western Transport Corridor Project*. Manila (Loan 1839-IND, for \$240 million, approved on 20 September); ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the East-West Corridor Project*. Manila (Loan 1944-IND, for \$320 million, approved on 26 November); ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the National Highway Corridor (Sector I) Project*. Manila (Loan 2029-IND, for \$400 million, approved on 13 November); and ADB. 2004. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the National Highways Sector II Project*. Manila (Loan 2154-IND, for \$400 million, approved on 1 December).

³⁴ ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the West Bengal Corridor Development Project*. Manila (Loan 1870-IND, for \$210 million, approved on 11 December).

³⁵ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and Technical Assistance Grant to India for the Madhya Pradesh State Roads Sector Development Program*. Manila (Loans 1958/1959-IND, for \$180 million, approved on 5 December).

Government's lead in deciding the nature of its assistance. For example, although private sector participation was an important theme in the earlier projects, it was not part of the National Highway Sector II Project, which focused more on the capital investment component. On the other hand, the programmatic approach has been successful in catalyzing larger funding for the Central Road Fund. The National Highway Public Private Partnership (Sector) Investment Program for NHDP III, which is now being processed, has negligible institutional development interventions, but brings in a new approach to private sector participation. While the programmatic approach was intended to be a progressive mechanism for implementing ADB's strategies, it has only been partly successful in providing consistency in project designs.

42. Entry into the state highways sector in 2002 began in Madhya Pradesh state, where ADB had approved a major loan for the State Public Resource Management Program.³⁶ That loan succeeded in creating a better policy environment for identifying, designing, funding, and implementing transport projects in the state. ADB's involvement in rural roads was a response to its growing focus on poverty reduction. The Rural Roads Sector I Project was designed to fit within the nationwide program, but with a focus again on Madhya Pradesh and Chhattisgarh. The high degree of relevance of this project seems to show that ADB's overall initiatives in the road and highway subsector are moving toward a clearer geographic focus and contribution to poverty reduction through economic growth. Recent studies indicate a positive correlation between rural roads improvement and poverty reduction.³⁷ The International Food Policy Research Institute has found that more public spending on rural roads has the greatest impact on poverty reduction and on productivity growth.³⁸

B. Environmental and Social Safeguard Strategies

43. ADB's environmental and social safeguards in the transport sector in India are relevant to the overarching goal of pro-poor growth. The safeguards are aimed at preventing and mitigating the adverse impacts of projects on the environment and at ensuring that the livelihoods of all affected persons, particularly among vulnerable groups like indigenous people, female-headed families, and other socially disadvantaged people, are restored to at least their pre-project levels. A recent evaluation³⁹ found that in India and especially in the transport sector, ADB staff and the Government officials tend to prefer projects that are less environmentally sensitive (Box 2). While India has a well-developed and comprehensive legal basis for its environmental safeguards, the implementation and enforcement of ADB guidelines have been fraught by delays in project implementation. ADB has been working with the Government and other development partners in developing environmental safeguard systems for India that are better aligned with the country's priorities, systems, and procedures, to avoid duplicating efforts.

³⁶ ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Madhya Pradesh Public Resource Management Program*. Manila (Loan 1717-IND, for \$250 million, approved on 14 December).

³⁷ ADB. 2006. *When Do Rural Roads Benefit the Poor and How? An In-depth Analysis Based on Case Studies*. Manila; and ADB. 2007. *Special Evaluation Study on the Performance of Technical Assistance*. Manila.

³⁸ Fan, S., P. Hazell, and S. Thorat. 1999. *Linkages between Government Spending, Growth, and Poverty in Rural India*. Research Report 110. Washington, DC. Available: <http://www.ifpri.org>

³⁹ ADB. 2006. *Special Evaluation Study on the Asian Development Bank's Environment Policies with a Focus on Environmental Safeguards*. Manila.

Box 2: Findings of the OED Study on Environmental Safeguards

India's environmental safeguard system is stringent, perhaps even more so than the ADB system. ADB and the Government have pursued a strategy of avoiding sensitive subprojects by picking only those sections of roads that can be classified as "B" under the ADB classification system. This preference has led in some cases to situation where ADB finances road sections going into and coming out of a nature sanctuary, and leaves NHAI itself to finance the sections within the sanctuary. Getting environmental clearance from the Ministry of Environment and Forests for relatively more environmentally sensitive sections of roads would take 1–2 years causing excessive delays and higher commitment charges for ADB-financed projects. In the case of the Loan 2019 National Highway Corridor Sector I, ADB financed the Chittorgarth-Kota section, the edge of a gaviyal sanctuary, and the section starting at the other end of the sanctuary, leaving NHAI to handle the bypass section within the Jawahar Sagar Sanctuary. The Ministry of Finance has affirmed the Government's support for ADB's approach of avoiding environmentally sensitive sections of roads, since doing so reduces the cost of borrowing, particularly in the form of commitment charges and interest during construction. At the same time, however, ADB's safeguards are apparently perceived to be difficult to implement for environmentally sensitive projects in the transport sector.

ADB = Asian Development Bank, NHAI = National Highways Authority of India, OED = Operations Evaluation Department.

Source: ADB. 2006. *Special Evaluation Study on the Asian Development Bank's Environment Policies with a Focus on Environmental Safeguards*. Manila.

44. Regarding environment issues in the transport sector, the matter of vehicle emissions has yet to be addressed by ADB. India has adopted various norms in line with the international emission norms.⁴⁰ There has been growing awareness in India of the problem of motor vehicle emissions. Given these concerns, and the growing worldwide concerns about greenhouse gases, ADB should make more of an effort to link policy initiatives in this area with transport operations to ensure that this issue is effectively addressed. This issue is discussed further in chapter VIII.

45. India's involuntary resettlement safeguards for transport projects have not always converged with ADB standards (Box 3). Coupled with this are administrative difficulties in implementing ADB's involuntary resettlement policy in India—inadequate land records, lack of experienced consultants, slow judicial system for resolving compensation disputes, and inadequate capacity within executing agencies' for managing resettlement.⁴¹ These issues have complicated the enforcement of the safeguards. In addition, ADB's involuntary resettlement safeguards require ADB to perform multiple checks on resettlement planning at the India Resident Mission and at the ADB headquarters. Executing agencies consider some of these measures redundant and causing delays in implementation. Unlike the World Bank's Resident Mission, ADB's resident mission is not staffed to provide the type of in-country expertise needed to address resettlement issues during project processing or project implementation.

⁴⁰ The Bharat Stage II emission norms, which are akin to Euro II norms, were enforced in India in 2005. Bharat Stage III emission norms, which are akin to Euro III norms, came into force in 11 megacities for four-wheeled vehicles manufactured on or after April 2005.

⁴¹ ADB. 2002. *Technical Assistance for Capacity Building for Resettlement Risk Management*. Manila (TA 6091-REG, for \$500,000, approved on 19 December).

**Box 3: Findings of the Operations Evaluation Department
Study on Involuntary Resettlement**

The adoption of the National Policy for Involuntary Resettlement and Rehabilitation in India in February 2004 was a major step forward from a situation where the Land Acquisition Act of 1894, amended in 1984, was the main legislation governing resettlement. However, the existing laws do not make it mandatory to pay relocation and transfer expenses or to provide transition and livelihood support; to give assistance to vulnerable people; to reestablish agricultural and business production; to assist in restoring incomes; and to restore social services, social capital, community property, and resources, although all these are partly covered by the Urban Development and Housing Act. The policy, in fact, refers mainly to large resettlement operations, and differs significantly from the Asian Development Bank's (ADB's) mandatory requirement to prepare a resettlement plan and special measures in case a loss of livelihood greater than 10% is anticipated for at least 200 affected persons. Courts in India quite specifically opposed any "reward" of assistance to squatters when they demand this, thus posing a special problem in the application of the ADB policy.

Source: ADB. 2006. *Special Evaluation Study on the Asian Development Bank's Involuntary Resettlement Policy*. Manila.

46. Transport projects often involve environmental and resettlement issues, so adequate safeguard provisions are needed. This is reflected in the Planning Commission's approach paper to the 11th FYP, which recognizes the need to develop a transparent policy rules for resettlement compensation, to make the affected persons beneficiaries of the projects, and to give legal standing to these rules with respect to the rights of the displaced. While this would be a step in the right direction, the legal structure must first be streamlined so that issues like the lack of land records are also addressed. The Government views ADB's approach to the enforcement of these safeguards as inflexible and, in some cases, unrealistic. Administration of these safeguards is perceived as bureaucratic, requiring several layers of approval within ADB.

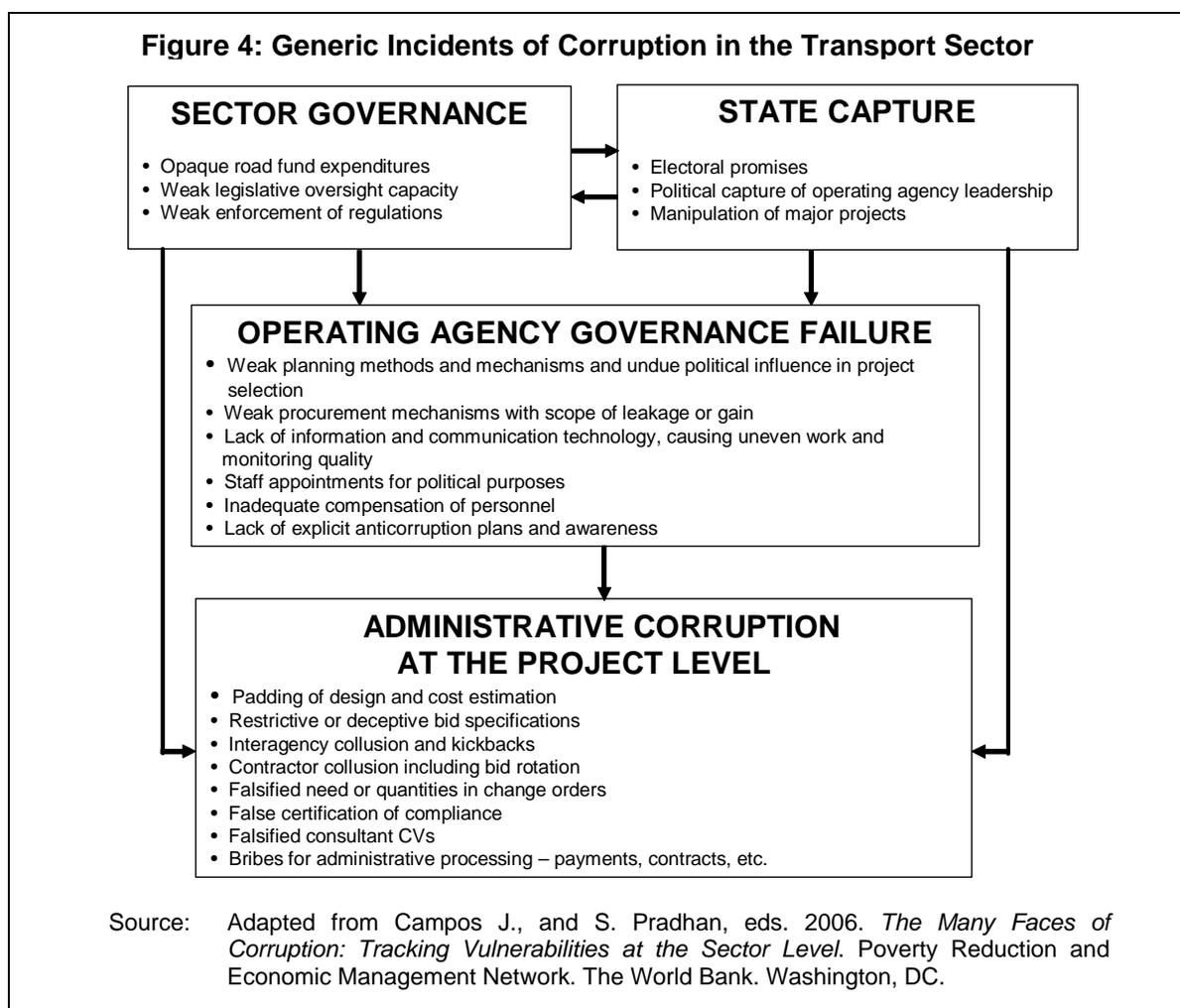
47. ADB's country strategies have increasingly focused on "inclusive social development" in infrastructure projects, as one of the three pillars of its operations in India—along with sustainable economic growth and good governance. Thus, the prevention of HIV/AIDS and trafficking of women and children, road safety, and public education have become standard mitigation measures in the design of ADB-supported road projects. It remains to be seen, however, whether the rhetoric will be supported by adequate implementation. There has been limited application of these measures during project implementation, as well as after project completion. For example, an HIV/AIDS awareness campaign and human trafficking were part of the National Highway Corridor (Sector) Project but were not effectively implemented.

48. Project monitoring continues to focus primarily on engineering activities, principally the review of contracts (civil works tenders and progress of road and rail improvements), and pays limited attention to transport sector road maps (Appendix 5) and the corresponding performance indicators agreed on between the Government, ADB, and the World Bank. These road maps have no "social" indicators (other than reductions in traffic accidents) that would assist in monitoring project-related benefits and help to quantify progress against the prescribed social objectives. The indicators also do not include any measures related to institutional capacity-building activities and their sustainability, such as acceptance and use by the executing agency of new systems, procedures, and user manuals developed with ADB assistance. ADB must take steps to strengthen the transport road maps, in conjunction with the executing agencies and other development partners, to establish realistic targets, and to identify verifiable, measurable indicators for monitoring. In addition, these road maps must be used while designing projects.

C. Sector Governance and Anticorruption Activities

49. Governance in the transport sector has undergone a positive change with the gradual development of an enabling environment that allows the entry of the private sector into the rehabilitation and maintenance of transport infrastructure. There is growing awareness that government needs to act more as a facilitator rather than as the executing agency. This is apparent in the evolution of NHAI from a developing and operating agency to a catalyst for private sector participation. The Government has increasingly decentralized responsibilities in the transport sector to encourage wider participation in decision making. The PMGSY program for rural roads is based on a decentralized process of project identification and implementation. The need to improve the performance of state-owned enterprises is recognized. State governments have increasingly corporatized specific activities to make them more efficient and effective, and to improve service delivery. The development of the Madhya Pradesh Road Development Corporation is a step in this direction. This resulted in an examination of innovative means of improving services, among them, customized BOT contracts that include various aspects of traffic enforcement like axle load control. The ADB-supported Madhya Pradesh public resource management program (footnote 36) was instrumental in establishing a policy and focused institutional capacity for private sector participation to set the scene for the development of sector-specific support (e.g., roads and power). This led to the enabling governance environment for preparing a road sector development policy to improve the road network and maintenance, and encourage private sector participation through various schemes. Other states have also been moving in the same general direction. While the investment climate in the transport sector has improved, much remains to be done in de-bureaucratizing activities.

50. Corruption is another governance issue. There have been recurrent allegations of corruption in various aspects of the transport sector, including payments to (i) secure driving licenses without training and testing, (ii) facilitate the passage of overloaded trucks or those without valid fitness certificates, (iii) avoid a fine for a driving violation, (iv) secure major engineering or construction contracts, or (v) circumvent specifications during construction. Figure 4 provides an indication of the generic incidents of corruption across the transport sector. These activities appear to exist in varying degrees in most parts of the country. The lack of adequate resources for curbing these activities, coupled with administrative procedures that create opportunities for inappropriate behavior, allows these activities to continue. The experience in other countries suggests that the use of mechanisms to encourage private sector participation shifts the locus of corruption from public procurement to the award of franchises.



51. ADB's Office of the Auditor General – Integrity Division investigated several corruption allegations related to ongoing and completed ADB-supported transport projects in India. Key findings of the audit were:

- (i) In the East-West Corridor Project: Evidence of bid manipulation in the selection of nonqualified bidders and disqualification of qualified bidders for six packages in Gujarat. As a result, one firm was debarred for at least 3 years.
- (ii) In the Chhattisgarh State Roads Project: Evidence of misrepresented information and actual signatories in the résumés of proposed experts. As a result, ADB debarred a participating firm and a proposed expert for 3 years each.
- (iii) In the Rural Roads Sector I Project: Three supervision consultants replaced a large number of their experts on the project team; from 84% to 92% of the team composition changed after the contract award. The explanations for replacement were judged to be reasonable. The reasons given included, among others, lengthy contract negotiations and budget constraints requiring revisions in proposals and necessary adjustments in experts' person-months and contract price.

52. A 2002 study by the Central Vigilance Commission reported on the specific issues facing the construction industry at that time. These issues are relevant to the transport sector, as much of the proceeds of ADB loans are used to finance civil works contracts. The report identified the key problem areas of corruption in construction as "administrative approval, detailed estimate

and technical sanction, consultancy, preparation of tender documents, invitation and opening of tenders, tender scrutiny and award of works, works agreement, payment to contractors, site records, and quality in construction.”⁴² In the case of ADB’s transport projects, there are several areas where the findings of that study could be applicable, although given the scope of this evaluation, it was not possible to identify all the areas or to find strong evidence to support the findings. Since the findings of ADB’s Integrity Division revolve around the appointment of supervision consultants, this is one area where ways need to be found to mitigate the risk of corruption affecting ADB projects.

53. Reports submitted to ADB’s Board for project approval do not explicitly include specific corruption risk mitigation measures other than standard deterrents such as using the International Federation of Consulting Engineers (Fédération Internationale des Ingenieurs-conseils [FIDIC]) with typical monitoring mechanisms, explaining ADB’s anticorruption policy to the executing agency, and including relevant provisions of the policy in the bid documents. To address corruption, ADB has largely relied on the Central Vigilance Commission, which regularly and independently investigates possible cases of corruption. While the Central Vigilance Commission and ADB’s Integrity Division conduct audits independently, there is a need for more proactive measures to counter the risk of corruption. The investigatory approach could be complemented by sector work and innovations in project design that are designed to reduce opportunities for corruption.

54. ADB could be more proactive in finding ways to engage in this difficult area in its operations in the Indian transport sector. The World Bank has been exploring corruption-mitigating measures such as using “e-government” practices requiring the electronic submission of tenders for goods and services. Other approaches that could be explored include enforcing sanctions against guilty firms across government departments, using independent observers from nongovernment organizations in contract award committees, developing agency report cards, and harmonizing anticorruption efforts to mitigate the risk of corruption with those of other development partners.

55. ADB’s Governance and Anticorruption Action Plan II⁴³ prioritizes the identification and implementation of measures at project entry level to reduce governance- and corruption-related risks in the various sectors. ADB must make more effort to implement this approach in the Indian transport sector, as not enough attention has been paid to this issue in the past. Management and senior staff should give more guidance to ADB staff in this difficult area. After all, strengthening anticorruption initiatives is an explicit corporate priority in the ADB’s *Medium-Term Strategy II*. Specific recommendations in ADB’s Governance and Anticorruption Action Plan II include (i) employing professionally recognized experts in sector governance, institutional development, and corruption prevention; (ii) training ADB sector specialists to a level where they can undertake institutional development and anticorruption work; and (iii) ensuring that those recruited for the sectors in the future have institutional development and corruption prevention skills. All these measures are relevant to the transport program in India.

D. Coordination with Other Development Partners

56. ADB’s assistance to India’s transport sector has been part of a larger assistance program financed by several other multilateral and bilateral partners active in the sector,

⁴² Government of India. 2002. *Problem Areas of Corruption in Construction*. Chief Technical Examiners Organization, Central Vigilance Commission.

⁴³ ADB. 2006. *Second Governance and Anti-Corruption Action Plan II (GACAP II)*. Manila.

including the World Bank, the Japan Bank for International Cooperation (JBIC), and the United Kingdom's Department for International Development (DFID). In terms of their contributions, ADB and the World Bank have provided the most financial assistance (in about equal amounts), followed by JBIC and DFID. Since annual donor consultative meetings ceased in 2003, the development partners have had no formal coordination meetings. However, "frequent" informal contacts reportedly take place "as required" and at "all levels" within the respective organizations—involving staff at ADB headquarters and at the India Resident Mission, with their counterpart representatives and offices of the World Bank, JBIC, and DFID.

57. In 2001, ADB developed a coordinated assistance strategy for the road subsector jointly with the World Bank. This was essential since ADB and the World Bank were both involved in the national, state, and rural road improvement programs. The coordinated strategy enabled a broad agreement on the states where ADB and the World Bank would focus their activities. However, it did not provide much support in resolving common implementation issues. ADB and the World Bank have been the major aid agencies for the development of the NHDP. In 2002, ADB, the World Bank, and NHA agreed that ADB would primarily focus its lending on the western half of the Golden Quadrilateral, the western half of the East-West corridor, and the northern half of the North-South corridor. The World Bank would primarily focus on the northern half of the Golden Quadrilateral and the eastern half of the East-West corridor, and the southern half of the North-South corridor. Currently, ADB participates in a tripartite portfolio review meeting chaired by the Ministry of Finance and attended by all the implementing agencies. This meeting appears to be an effective way of resolving implementation issues and reviewing project progress.

58. Table 3 summarizes ADB's completed and ongoing involvement, compared with that of the World Bank and JBIC. ADB is expected to fund about 20% of the first two phases of the NHDP. However, just over a quarter of the road improvement works have been completed, about 6% of the entire program.

Table 3: ADB, JBIC, and World Bank Contributions to India's NHDP

NHDP (phases I and II)	Total Coverage (km)	ADB Coverage (km)		World Bank Coverage (km)		JBIC Coverage (km)	
		Planned	Completed (as of 31 July 2006)	Planned	Completed (as of 31 July 2006)	Planned	Completed (as of 31 July 2006)
Golden Quadrilateral	5,846	948.7	733	1,043.6	83	165.4	165.4
NS/EW Corridor	7,300	1,734.9	0	752.7	0	0	
Total	13,146	2,683.6	733	1,796.3	83	165.4	165.4
% of total NHDP Phases I and II	100	20.4	5.6	13.7	0.63	1.3	1.3

ADB = Asian Development Bank, EW = East-West, JBIC = Japan Bank for International Cooperation, km = kilometer, NHDP = National Highways Development Program, NS = North-South.
Source: Operations Evaluation Mission.

59. Table 4 gives details of donor support for the PMGSY program for rural roads in India. ADB will fund 16.5% of the current total coverage (in km) of the program. Very few of the ADB-funded projects have been completed. The PMGSY program is hampered by several implementation issues (Appendix 6). These problems also affect the projects being funded by the World Bank.

Table 4: ADB, World Bank, and JBIC Contributions to the PMGSY Program

PMGSY	Total Coverage (km)	ADB Coverage (km)		World Bank Coverage (km)	
		Planned	Completed (as of 31 October 2006)	Planned	Completed (as of 31 October 2006)
PMGSY/Bharat Nirman ^a	146,185	24,145	646	8,258	3,763
% of total PMGSY	100	16.5	0.44	5.65	2.57

ADB = Asian Development Bank, JBIC = Japan Bank for International Cooperation, km = kilometer, PMGSY = Pradhan Mantri Gram Sadak Yojana.

^a Bharat Nirman is the new program that is in line with the PMGSY and takes a focused approach to the implementation of PMGSY rural roads.

Source: Operations Evaluation Mission.

60. The railway subsector has received considerable external support over an extended period. The World Bank was the leading source of external assistance, providing \$2.1 billion in loans for 18 projects between 1959 and 1988. From 1988 onward, the World Bank stopped supporting the Indian Railways, but in 2002 it approved a project to develop a separate urban railway serving Mumbai. ADB provided railway loans aggregating \$415 million in 1987 and 1991. The leading bilateral funding agencies for railways have been Germany and Japan, which have financed six projects each since the early 1980s. Germany's support has been mainly for the supply of equipment and the strengthening of its production units, and Japan's support, for urban railway systems, most recently for the construction of the Delhi metro system. Other bilateral funding agencies include France, Saudi Arabia, Switzerland, and the United Kingdom. Overall, until the early 1990s, external assistance financed railway investments with varying success. After that time, external assistance was reduced as funding agencies became concerned that investments would not achieve their potential impacts until institutional and policy reforms were implemented to address key obstacles to sector performance. Since 2002, ADB has taken the lead in providing assistance to the railway sector.

E. Assessment of the Relevance of ADB's Strategies

61. ADB's operational strategies in the transport sector have been in line with the Government's changing development needs, both long- and short-term, during this 20-year period. However, the formulation of some operational strategies may have overestimated the demand for transport infrastructure;⁴⁴ placed too much emphasis on civil works relative to social systems, planning, and coordination requirements in the transport sector; and reflected an unrealistic assessment of institutional capacity to handle the implementation activities in both ADB and India, particularly at the state level and within the road construction industry. Despite these weaknesses, the assistance program has been broadly relevant in addressing the needs of the sector and in complying with ADB's sector strategies and policies.

62. The objectives and priorities have evolved over time, in accordance with operational strategies and policies based on perceived needs (Table 2). The focus of assistance has broadened from just capital investment using traditional engineering, procurement, and construction contracting to more strategic foci supported by policy reforms and institutional strengthening in PPP, and support India's poverty reduction strategy and the Government's initiatives in the transport sector. With the continued focus on the transport sector, ADB's

⁴⁴ This is apparent for national highways where actual traffic has been less than the appraisal forecast.

strategy in the country has been consistent, ensuring long-term continuity and engagement in the sector. This has enabled the evolution of better comparative assistance advantage in both physical and policy interventions. Appendix 7 provides a more detailed assessment of the strategic positioning of ADB and the gaps therein.

63. Although not stated explicitly in strategy and program papers, ADB's sector goals for India's transport sector over the past 2 decades have encompassed (i) improving infrastructure, (ii) strengthening institutions and building the capacity of national and state transport agencies, and (iii) supporting poverty reduction through infrastructure-led growth and spreading social benefits to rural communities. The actual achievements are assessed in the next section with these broad goals in mind.

IV. IMPLEMENTATION AND OPERATION OF ADB-FUNDED PROJECTS

A. Lending Projects

64. Only four of 15 approved road and highways projects have been completed.⁴⁵ The majority of projects assessed were, therefore, ongoing projects (under construction at the time of the OEM in 2006). Hence, the discussion of efficiency largely relates to implementation (project processing and administration) efficiency as opposed to the efficiency of investment, as is typically represented by the economic internal rate of return (EIRR). Where relevant, references are made to the appraisal and post-completion estimates of EIRR. The assessment in this section is designed to determine (i) the objectives ADB intended to achieve in the sector through the projects; (ii) the degree to which ADB has achieved the objectives (or is taking an appropriate approach in ongoing projects to help achieve them); and (iii) the internal and external factors that affected project implementation, operations, and the achievement of the objectives.

1. Roads and Highways

65. Appendix 1 lists the ADB-supported road and highway projects. ADB's support has come in two main cycles: (i) completed projects, approved from 1988 to 1993, which focused on improving the highway network by reducing transportation bottlenecks; and (ii) ongoing projects, approved since 2001, which combine assistance to the central and state governments, and are concerned with improving the national highways to remove capacity constraints and improve road safety. Road improvements have typically involved the rehabilitation of existing roads, rather than the construction of new ones. This was consistent across all projects.

a. Completed Projects: National Highways and State Highways

66. Four national highway loans approved in 1988–1993 (Table 5 and Map 1) were all administered by the Ministry of Surface Transport.⁴⁶ All experienced significant delays in implementation. These projects involved implementing agencies—PWDs from a number of states—with little previous experience of working with international funding agencies. A common design feature of these early projects was the geographic dispersal of subprojects all over the country, negating any coherent effort to improve the effectiveness of institutions involved in these interventions.

⁴⁵ One of the loans (for the Bombay-Vadodara Expressway) was canceled because of problems with land acquisition following a lengthy debate about alignment possibilities and options.

⁴⁶ Now the Ministry of Shipping, Road Transport, and Highways.

Table 5: Completed Projects

Loan No.	Project	Outputs Achieved on Completion	Delay in Completion
918	Road Improvement Project	National Highways – 157 km State Highways – 386 km	4 years
1041	Second Roads Project	National Highways – 141 km State Highways – 554 km	3 years
1274	National Highways Project	National Highways – 330 km (as assumed, since no project completion report was available)	2 years
1747	Surat-Manor Tollway Project	National Highways – 175 km	1 year

km = kilometer.

Source: Asian Development Bank project reports.

67. Delays during implementation were caused by the time taken by executing and implementing agencies to acquire land, relocate utilities, obtain environmental clearances, and clear trees and other encumbrances within the defined right-of-way for the road improvements. Other issues noted in ADB project monitoring documents included the fact that inefficiencies occurred during the handover of responsibilities to the newly established NHAI and after that, because of deficiencies in NHAI's project management practices, disbursement irregularities, and inconsistencies in accounting systems. Confusion over the respective roles of "engineer" and "employer" and the lack of experience of the executing and implementing agencies with FIDIC conditions of contracts for roadworks caused difficulties during implementation. ADB should have been more proactive in providing training to accompany the introduction of FIDIC and international tendering, tender evaluation, and contract award.

68. The civil works contracts failed to attract bids from international contractors because of their small size. However, Indian contractors did not have enough experience with such contracts. As a result, projects faced contractor cash-flow problems, as well as issues related to safety during construction, slow progress of works on-site, and inadequacy of personnel. These problems were continually discussed in ADB's monitoring reports and could not be resolved despite reported efforts to mitigate these issues. Appendix 6 provides a summary of the implementation performance for each of the above projects.

b. Ongoing Projects: National Highways, State Roads, and Rural Roads

69. Table 6 provides a summary of the ongoing ADB-supported projects, all of which were approved in the new millennium.

Table 6: Ongoing Projects

Loan Number	Project	Targeted Outputs (km)	Current Estimated Delay (years) ^a
National Highways			
1839	Western Transport Corridor	259	2.5
1944	East-West Corridor	505	1.5
2029	National Highway Corridor (Sector) I	662	1.8
2154	National Highway Sector II	566	1.5
State Highways			
1870	West Bengal Corridor Development	150	2.0
1959	Madhya Pradesh State Roads Sector Development Program (Project Loan)	1,750	0.9
2050	Chhattisgarh State Roads Development Sector	1,700	1.3
Rural Roads			
2018	Rural Roads Sector I	11,000	1.5

km = kilometer.

^a Estimated on the basis of the information provided in project performance reports, using a combination of elapsed loan period and project progress.

Source: Asian Development Bank management information system.

70. All the ongoing projects are characterized by implementation delays at various levels. Common factors contributing to these delays are summarized below and discussed in greater detail in Appendix 6:

- (i) Project preparation and administration:
 - (a) inadequate or inaccurate project preparation, especially detailed project reports;
 - (b) inadequate technical resources in executing and implementing agencies;
 - (c) land acquisition and removal of encumbrances from the right-of-way;
 - (d) delays in the preparation and approval of resettlement plans;
 - (e) unclear environmental assessments and lack of familiarity with the requirements of environmental safeguards; and
 - (f) lack of procurement planning.
- (ii) Contractors' performance:
 - (a) insufficient or inadequately experienced engineering staff of consultants and the contractors, resulting in poor performance by the overstretched supervision consultant or contractor;
 - (b) poor mobilization of equipment; and
 - (c) cash flow problems of contractors due to low bid prices.

71. To tackle the above issues, ADB has recently initiated the following measures:
- (i) To offset delays in setting up project management units and project implementation units, loan documents provide an assurance to ensure early establishment of these units;
 - (ii) To offset slow procurement, advance action on pre-construction activities and procurement have been made standard features on all highway projects;
 - (iii) Poor performance of contractors is being tackled by improving the prequalification criteria for joint venture partners;
 - (iv) Project-readiness checklist mainstreamed (Box 4);
 - (v) ADB has targeted to achieve specific milestones before loan negotiations – appointment of project implementation staff, commitment of counterpart funds, prepare detailed design for phase I of civil works, approve and issue bid documents for phase I of civil works and issue request for proposals for construction supervision consultants.

Box 4: Project-Readiness Indicators Developed by the Asian Development Bank (ADB)

- (i) Project implementation staff appointed;
- (ii) Counterpart funds committed;
- (iii) Detailed design for phase I civil works has been prepared;
- (iv) Bidding documents for phase I civil works have been approved and issued;
- (v) Bid evaluation report submitted to ADB;
- (vi) Request for proposals for construction supervision consultant issued;
- (vii) Consultant technical proposal evaluation report submitted to ADB;
- (viii) Land and right-of-way required for the 1st year implementation for phase I civil works have been obtained; and
- (ix) Environmental clearance required for the 1st year implementation for phase I civil works have been obtained.

Source: Asian Development Bank management information system.

72. Clearly, this is just a start and a lot more needs to be done. The above measures need to be supplemented with further actions to tackle the specific factors mentioned above. For

example, the above project-readiness indicators need to be fine tuned to reflect the local context.⁴⁷

i. National Highways

73. The evaluation team visited national highway projects in Chhattisgarh that have been, or are being developed on a BOT basis,⁴⁸ without ADB assistance. The visits enabled a cursory field assessment of evident operation and maintenance and safety benefits from private sector involvement in these activities. A section of NH6 is being upgraded, on a BOT basis, to serve as the southern entrance to Raipur. Inspection of the work site (both at night and in the daytime) revealed the inadequacy of signs warning drivers of diversion schemes and construction activity. Where the new dual carriageway has been completed (with service roads on both sides), there was inadequate provision of safe-crossing facilities for pedestrians on an intensively commercial section of the road. On this straight section, vehicle speeds tend to be high, yet, road signs were inadequate. On the other side of Raipur, the evaluation team visited the Durg bypass, which was completed in 1998 and was one of the early BOTs. The road has been maintained under the BOT contract, but the riding surface is uneven, with signs of poor maintenance practices. The bypass also has no centerline road marking and few traffic signs. Discussions with concerned officials indicated that although the BOT contract was being managed by NHAI, adequate remedial action was not taken. This underlines the institutional capacity issues faced by the NHAI at the project level.

74. Coordination among the various Government departments has been lacking. There is little interaction between the NHAI and the Ministry of Rural Roads, although both national highways and rural roads are centrally funded. In the past, there was insufficient coordination between the NHAI and the various State Governments, causing delays in land acquisition. This is being rectified now, although a lot remains to be done in terms of coordinating the transport planning and construction activities.

75. The road construction industry finds it difficult to cope with the demands placed on it by India's extensive road improvement and network expansion program. These issues are common across national, state, and rural roads projects, whether funded by the Government, ADB, or other development partners. The presence of international contractors has had no value addition since these contractors do not provide sufficient managerial, technical, and financial inputs in the implementation. The World Bank-sponsored road projects in India face problems similar to those reported for ADB projects. The industry, in general, faces the following problems: (i) only five to six major Indian contractors can provide the services (including staff) on BOT national highway schemes, and all have full order books; (ii) qualified professional engineers with road construction experience in India are in short supply, and new graduates are being attracted away from the industry by higher salaries in other fields, notably information technology; and (iii) road projects in some states and in remote areas have staffing problems because of commercial risks, security issues (some contractors have had equipment

⁴⁷ Based on the detailed design, a land acquisition plan can be prepared containing 100% census survey of all affected households and assets (covering both titleholders and non-titleholders), and a detailed resettlement plan could be prepared and made ready for ADB review. ADB can undertake the due diligence of the resettlement plan in parallel to the project approval. In a scenario where land has already been acquired by the executing agency in line with the Land Acquisition Act and in anticipation of ADB Project, there could be gaps between the ADB Involuntary Resettlement Safeguard policy and Government's framework. To tackle this, point (viii) in Box 3 could be modified to state "100% census survey of all affected people be completed and a land acquisition plan prepared based on the detailed design for the first phase civil works."

⁴⁸ Para. 26 gives details on the definition of BOT contracts.

destroyed), and poor living conditions. ADB's sole intervention on this subject was an ADTA to study the road construction industry in 1990 with the ADTA completed only in 2000. Although the ADTA was found to be useful, ADB must provide more assistance to the industry in institutional strengthening and capacity building.

ii. State Highways

76. The West Bengal Corridor Project, concerned with improving national, state, and rural roads, was adversely affected by the poor performance of the project implementation unit in the early period, problems with slow progress on civil works resulting in the termination of contractors, and resettlement issues. The Government opted to withdraw a subproject from ADB financing, since it intended to expand the scope of the subproject to widen the road and the expansion was likely to raise involuntary resettlement issues. The decision to withdraw from ADB financing was taken to ensure that the subproject was completed on schedule and without the delays, which the executing agency associated with complying with ADB social safeguard policies.

77. The corollary of selecting only those projects that do not involve safeguard issues appears to be unworkable, as seen in the Madhya Pradesh State Roads Project, where there have been difficulties in identifying such "ideal" subprojects. Since 2002, ADB has provided a combination of program and project loans to that state, thus serving the dual purpose of capacity development and financing capital investments. The Madhya Pradesh project loan was aimed at rehabilitating state highways with no safeguard issues. In other words, roads that were environmentally sensitive or involved resettlement were specifically excluded from the scope of ADB assistance. Although implementation was expected to speed up this way, excluding environmentally sensitive projects is counterproductive to the development of an integrated network. The executing agencies found it increasingly difficult to identify state roads without any safeguard issues. This contributed to implementation delays. Such incentives, which appear to be rational from the perspective of executing agencies and ADB staff, are unlikely to be what the ADB Board had in mind when it adopted ADB's safeguard policies.

78. Although Madhya Pradesh Road Development Corporation appears to be well organized and is developing into an efficient road management agency as ADB envisaged when it granted the program loan, most of its staff are merely on deputation from the PWD. This gives cause for concern about the long-term sustainability of the organization and its new systems and procedures. The remaining PWD organization appears to be overstaffed and had been excluded from the initial capacity-building activities within the TA and the program.⁴⁹ Another element of concern in Madhya Pradesh is the fact that government officials have rejected the need for a state road fund to cover road maintenance costs because (i) the Government of Madhya Pradesh is currently providing enough funds to cover the estimated cost of state-wide road maintenance needs; and (ii) in the past 2 years, the funds allocated for road maintenance have not been spent. ADB's continued involvement in roads in this state needs to facilitate policy reforms and strengthen organizational capacity to improve the sustainability of state roads and transport agencies. A dedicated road fund would allow systematic planning and prioritization of rehabilitation and maintenance activities in the state. While a road fund has its pros and cons, the absence of a maintenance planning tool in the Madhya Pradesh necessitates focused prioritization of its maintenance interventions.

⁴⁹ This shortcoming was partly rectified late in 2006 when the institutional capacity-building TA was extended to include the development of appropriate road management systems for the PWD in Madhya Pradesh.

79. Site visits to state road improvement projects found the same set of issues seen on national highways—poor road signs; inadequate traffic signals and barriers at construction sites; and inadequate signals at road diversion sites, particularly at bridge and culvert works.⁵⁰ Industry guidelines and standards have been developed for the Indian Roads Congress,⁵¹ but these are being ignored by contractors and supervision consultants.

80. The Madhya Pradesh loan had a program component that identified several policy actions as conditions for the release of tranches. The State Government found it difficult to satisfy a key condition of the loan relating to the implementation of the staff rationalization program, which was not completed. A more realistic approach based on sound analysis of a difficult problem and considering the views of stakeholders was required. On the whole, the design of the state roads development program could be improved, taking the realities of each state into account.

iii. Rural Roads

81. The Rural Roads Sector I Project⁵² covers Madhya Pradesh and Chhattisgarh within the Government's broader rural road program. It is managed by the Ministry of Rural Development and the rural road development agencies of the states, with the latter acting as executing agencies and project implementation units. In accordance with the basic goal of the Government's rural roads program, the project is aimed at reducing poverty and deprivation in the two states by providing better access to markets, employment opportunities, and social services to support economic growth. This is to be achieved by providing rural inhabitants with all-weather road connections and improving safety on rural roads. The project scope includes the reconstruction and upgrading of 5,500 km of rural roads in each state.

82. There have been delays in project start-up and in the mobilization of consultants in both states. Consultants have also reportedly changed the composition of their teams after contract award, which affected the implementation schedules and quality of services. Although the consultants' scope of activities includes training and awareness building among contractors and executing agencies, there has been no evidence that this has been done. Another indicator of the adverse impact on the quality of the consultants' outputs relates to the preparation of estimates as part of the detailed project reports. An evaluation made by the Planning Commission found that estimates prepared under the Government's rural roads program are on the higher side, causing underutilization of the allocated budget.⁵³

83. The rural road development agency in Madhya Pradesh reported inadequate performance by both consultants and contractors, with a lack of on-site presence by supervisory consulting teams and any effective training of contractors, as required by the consultants' terms of reference. Very few technical ADB missions had visited the project sites to assess the work activities. The construction sites are poorly managed in terms of traffic signs of the works and diversions. In addition, labor issues affecting contractor staff and other disputes were recorded as part of the socioeconomic study conducted as part of the evaluation (chapter V and Appendix

⁵⁰ Photographs in Appendix 14 illustrate these points.

⁵¹ Guidelines on Safety in Road Construction Zones. IRC:SP:55:2001.

⁵² ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Rural Roads Sector I Project*. Manila (Loan 2018-IND, for \$400 million, approved on 20 November).

⁵³ A sample project evaluated by the Planning Commission showed that the amount that remained unused on the completion of these projects varied from 6.83% to 32.19% (Source: Quick Concurrent Evaluation of PMGSY, Planning Commission).

12). The OEM's visit to Chhattisgarh found a similar situation with overall progress even less advanced because of issues with local contractors. Bid responses from contractors for works in remote parts of Chhattisgarh were poor because of security reasons and the size of contracts (too large for local contractors).

84. Despite low traffic, all rural roads were being paved to flexible asphalt concrete standards,⁵⁴ calling in question the economic viability of the roads because of the high cost of constructing paved roads. The rural roads have been overdesigned in terms of pavement thickness and the materials used. Besides the high cost of construction, these roads are likely to incur high maintenance costs in the long run, resulting in sustainability issues. The funding for rural roads could have been better used if alternative low-cost technologies suited to rural roads were explored.⁵⁵

c. Pipeline: National Highways, State Roads, and Rural Roads

85. Table 7 lists the roads and highways projects in the forward program.

Table 7: Future Projects

Year of Likely Processing	Project Name	Amount of Loan (\$ million)	Likelihood of Materializing	Processing Status
2007	North Eastern States Roads	300	Firm Medium for 2007	Appraisal
2007	National Highway PPP	400	Firm Medium for 2007	Pre-appraisal
2007	Bihar State Roads	500	2008	Concept cleared
	Total	1,200		

PPP = public-private partnership.

Source: Asian Development Bank management information system.

86. ADB has a fairly large future road program. Implementing this future program and the projects approved since 2001, which have rapidly increased, will require significant human resources to process and monitor the projects. The relevance of these projects cannot be doubted. But given the current performance of the ongoing projects, ADB and the Government need to take actions to improve their implementation and find ways to ensure that future projects are not affected. Box 5 provides an indication of the key areas where ADB could assist in addressing the implementation problems in the transport sector.

⁵⁴ The designs approved by ADB use concrete pavement through villages.

⁵⁵ For example, the use of sealed gravel roads is one option that could be explored for rural roads.

Box 5: Key Areas for ADB to Address Implementation Problems across the Transport Sector

- Enable better capacity building within executing agencies and implementation agencies.
- At appraisal, estimating more realistic implementation schedules and enabling better quality detailed project reports.
- Develop a database of contractor capabilities to weed out poorly performing firms.
- Enable better coordination among the various executing agencies and implementing agencies across the sector.
- Work closely with the Government in harmonizing ADB safeguards with the national systems and vice versa.^a
- Provide technical assistance in areas such as road safety, governance, institutional coordination, measures to mitigate climate change, and social inclusiveness.

ADB = Asian Development Bank.

^a Refer to recent ADB studies relating to the safeguards—TA 3365-IND: *Capacity Building for Social Development*; and TA 6091-REG: *Capacity Building for Resettlement Risk Management*; Operations Evaluation Department evaluations—ADB. 2006. *Special Evaluation Study on Involuntary Resettlement Safeguards*. Manila; and ADB. 2006. *Special Evaluation Study on Environmental Safeguards*. Manila.

Source: Operations Evaluation Mission.

2. Railways

87. Appendix 1 summarizes ADB-supported railway loans, which have followed two main themes. In 1987–1991, ADB provided two loans to support the expansion of line and freight haulage capacity. After a decade in which no new railway loans were approved, ADB in 2002 approved a loan centered on a program of institutional and policy reforms to improve the Indian Railway's commercial orientation,⁵⁶ in parallel to its support for capital investment projects.

a. Completed Projects

88. The first rail project, which included the provision of new electric freight locomotives, was delayed by 5 years, and the transfer of technology required a further 6 years. Implementation of the second rail project, which included a range of physical improvements and the procurement of wagons and spare parts, was delayed by 3 years. The project completion report rated the project less successful because of the poor compliance with some loan covenants and the less than full achievement of developmental impacts. Procurement for the project was overly complex. The weaknesses in project management are attributable to the slow acceptance by the Indian Railways of ADB's procurement policies, which differed from its procurement policies and procedures. Railway officials, as a result, became overly cautious in evaluating tenders and in implementing the project. Moreover, supervision by the railway management and by ADB staff during implementation was also inadequate.

b. Ongoing Project

89. Because of the continued resistance of the Indian Railways to fundamental policy reforms in the 1990s, ADB delayed further involvement in the rail subsector until a new policy reform-oriented loan project was approved in 2002. The new project was aimed at improving the performance of the rail sector by supporting a program of prescribed institutional and policy reforms to develop the commercial orientation of the Indian Railways, expand core businesses,

⁵⁶ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Railway Sector Improvement Project*. Manila (Loan 1981-IND, for \$313.6 million, approved on 19 December).

finance priority investments to overcome bottlenecks in capacity, and improve operating efficiency and safety. These reforms are expected to strengthen the Indian Railways' accountability, transparency, and management. This reform program was agreed on between Indian Railways and ADB and there appeared to be appropriate commitment, at the start, to implement it. The reform program was tabled before the Parliament, an unprecedented step. However, the program later lost momentum for two main reasons. First, a change in the membership of the Railway Board⁵⁷ diluted awareness of the reforms and enthusiasm for decision making. The turnover of ADB project officers also gave ADB staff few opportunities for policy dialogue with the new Board members. Second, in the run-up to the national elections, there was a change in the government from a coalition dominated by the Bhartiya Janata Party to one dominated by the Congress Party. This change led to uncertainty in the commitment of the new government to implement the reforms. However, in late 2006, consistent with the reform agenda, the Indian Railways initiated several measures to promote the use of private sector participation (Appendix 4).

90. The reforms now being implemented in the railway sector selectively—commercial development of land and air space, increasing private sector involvement in container handling, and increasing permissible axle load—are commendable steps. However, much remains to be done to improve decision-making as part of the organizational restructuring, further transparency in tariff setting, and product-oriented style of operations. Thus, while progress is being achieved in certain areas, detailed reforms have yet to make headway.

91. While structuring and implementing such reforms in a large, complex organization was admittedly difficult, the OEM concluded that value-added support from ADB staff was also lacking.⁵⁸ ADB project officers changed three times in 3 years, resulting in discontinuity and a loss of institutional memory. In addition, ADB project officers dealing with the Indian Railways did not have enough experience with railway reforms. As a result, ADB could not transfer best practices from other countries in this area. To enable more frequent dialogue with Indian Railways, there is a need to delegate supervision to the India Resident Mission. Such frequent dialogues are crucial in implementing complex reforms. But the India Resident Mission would need to be properly staffed and to have the required expertise for this responsibility. Box 6 identifies specific areas for ADB to improve the implementation of railway projects.

Box 6: Key Areas for ADB Assistance to Address Implementation of Railway Projects

- Transfer loan administration and project implementation responsibilities to the India Resident Mission.
- Ensure that the India Resident Mission has sufficient technical resources to administer the railway reform program and the capital investment projects.
- In conjunction with the Government (including the Indian Railways), revise the reforms agenda to recognize the progress until date.
- Enable capacity building within the Indian Railways to develop better familiarity with ADB's procurement and safeguards policy.

ADB = Asian Development Bank.
Source: Operations Evaluation Mission.

⁵⁷ As in most other public sector organizations in India, the composition of the Indian Railways board changes periodically. Although there is a strong institutional memory, the speed of decision making slows down as new incumbents are disinclined to take major decisions.

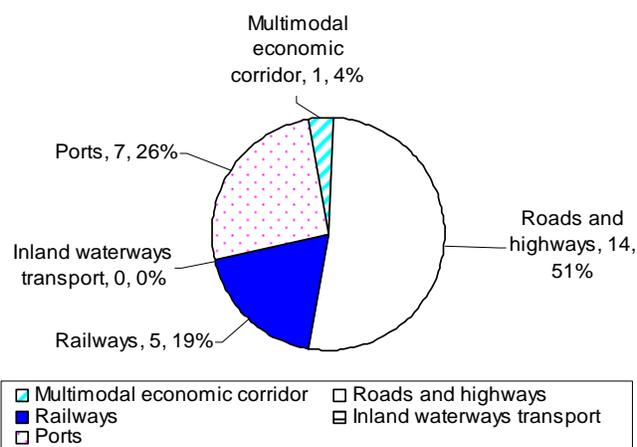
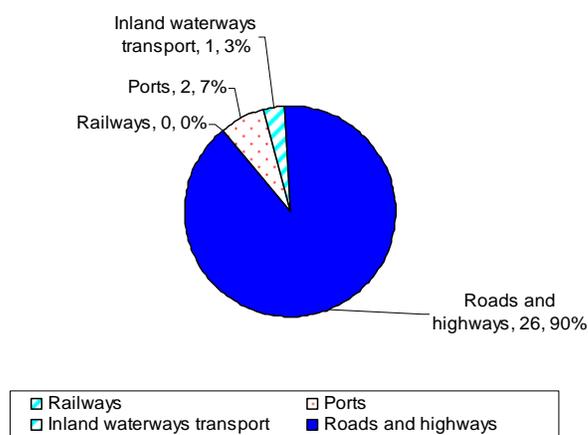
⁵⁸ The reform program is supported by an ADB TA, which provides management consulting services to the Indian Railways to monitor policy reforms and advice on business opportunities (Appendix 8).

92. The implementation of the capital investment component of the project has been delayed significantly and disbursements have been slow.⁵⁹ A series of difficulties have been experienced in the procurement for civil works associated with rail system upgrades and the implementation of the specified policy reforms. Inadequate supervision by ADB staff adversely affected the capital investment component. For example, four issues could have been resolved with more effective supervision. First, the basic project design required detailed technical specifications including detailed costing; the unfamiliarity of executing agency staff with these led to several delays. Second, the large integrated contracts that ADB required the railway to award drew poor responses from contractors, and the apparent raising of prequalification criteria did not help matters. Third, there are inconsistencies between ADB's involuntary resettlement policy and the country's national policy and laws, particularly with regard to replacement value and indigenous people. This gap has been further widened by the inability of ADB and the Indian Railways to arrive at a mutually acceptable procedure and output for a resettlement plan, prompting the withdrawal of an "urgent" project from ADB assistance. Fourth, the approval of reports by ADB was delayed in several instances. In one such instance, ADB took 8 months to approve a social assessment report. The first two issues have since been resolved and progress is being made on the other two. This experience underlines the point that ADB must adopt a more flexible approach to implementing projects, rather than a standard approach for all countries.

B. Nonlending Projects: Technical Assistance

93. Among multilateral and bilateral development agencies, ADB is the largest provider of TA to the Indian transport sector. Besides helping to improve the capacity of the national agencies and targeted state governments in key areas of road, rail, and inland waterways sector planning and management, the TA projects were important tools for ADB in carrying out policy dialogue on issues such as policy reforms, sector and subsector restructuring, private sector participation, and socioeconomic considerations. In the roads and railways subsectors, from 1988 to 2005, ADB has provided 45 TA projects (19 ADTA and 26 PPTA projects) amounting to \$22.75 million (\$11.53 million for the ADTA projects; \$11.22 million for the PPTA projects) (Figure 5). Appendix 8 gives details on the evaluation of the ADTA projects.

⁵⁹ The project was approved in December 2002. Only 0.5% of the loan had been disbursed by 31 December 2005 and only 13% by 31 August 2006. By 31 December 2006, when 73% of the loan period had elapsed, only 10% of the project had been completed.

Figure 5: Advisory and Project Preparatory Technical Assistance Projects**Advisory Technical Assistance****Project Preparatory Technical Assistance**

ADTA = advisory technical assistance, IWT = inland waterways transport, PPTA = project preparatory technical assistance.

Source: Asian Development Bank.

94. Although ADB requires completion reports on all completed projects, only 6 such reports (roads and highways) have been produced for the 10 completed ADTA projects. Some ADTA projects are reviewed in project completion reports or project performance evaluation reports, where appropriate,⁶⁰ but, in general, this is a poor documentary record and internal assessment of TA projects. Given the volume of TA involved, there is a cause for concern. This calls into question the seriousness of ADB's effort to learn lessons from completed TA projects in the Indian transport sector.

95. The evaluation team examined ADTA projects for the roads and railways subsectors. The ADTA projects can be clustered into five groups: (i) systems planning, (ii) institutional capacity building, (iii) private sector participation, (iv) policy development, and (v) safety. Appendix 8 provides assessments of the completed ADTA projects, based on the available TA completion reports and/or reviews within project completion reports where available, together with the observations and perceptions gathered during the field work. Table 8 provides a summary of these assessments.

Table 8: Assessment of Advisory Technical Assistance Grants

Theme	Highly Successful	Successful	Partly Successful	Unsuccessful
Transport systems planning	2	1	2	2
Institutional capacity building	1	4	1	
Private sector participation	1	1	1	
Policy development		1	1	
Safety			1	

Source: Operations Evaluation Mission.

⁶⁰ For example, the project completion report for Loan 1041-IND incorporates reviews of ADB. 1990. *Pavement Management for National Highways*. Manila (TA 1402-IND, for \$760,000); ADB. 1990. *Private Sector Participation in Expressway Financing, Construction and Operation*. Manila (TA 1403-IND, for \$500,000); and ADB. 1990. *Road Construction Industry*. Manila (TA 1404-IND, for \$340,000).

96. Most of the ADTA projects were relevant to the needs of the recipient agencies. Their efficiency and effectiveness were mixed, for several reasons, such as lack of familiarity with new systems, insufficient ownership by the recipient agency, inadequate training, and inadequate TA design. These factors affected the sustainability and impact of the ADTA projects. Overall, four of the 15 completed ADTA projects were highly successful, and the others showed varying levels of success.

97. **Systems Planning.** In the completed roads and highways TA projects, the new systems were generally not fully made operational and institutionalized. The recipient executing agencies at both national and state levels did not take ownership of the new techniques (e.g., project monitoring systems) and, as a result, institutional impact and long-term sustainability were not achieved. The new systems apparently did not meet the needs of the executing agencies, and ADB's follow-up work with the agencies was ineffective in getting them to implement the systems. The ongoing TA for the northeastern states incorporates modern techniques using application-based tools. Technical success is likely, but whether the executing agency will implement and use the new tools after the consultants leave remains to be seen.

98. In the railway subsector, the TA projects focused on ways and means to improve the efficiency and commercial orientation. While the recommendations of the first two TA projects on ways to improve operating efficiency and rationalize nonbulk general cargo freight were accepted, it did not accept as readily the recommendations of the third TA on ways to improve traffic costing and financial management reporting. ADB continued its railway sector policy dialogue to facilitate a reorientation toward a revised costing system, albeit on a pilot basis. This dialogue did not result in effective actions, causing ADB to halt further railway lending. Better costing is being addressed by an ongoing project, which includes a specific reform agenda.

99. **Institutional Capacity Building.** The completed TA projects generally achieved positive results, with indications of enhanced NHAI capacity for contract and environmental management. However, the Ministry of Surface Transport and the Indian Roads Congress did not embrace the proposed standards for highway concrete. The Government is still reviewing the recommendations from the recently completed TA projects as part of the ongoing restructuring. Other ongoing state level TA projects appear to have had mixed results.

100. **Private Sector Participation.** The completed TA projects were successful in this regard, with NHAI adopting the guidelines for attracting the private sector in the national network development. There was little evidence of the effectiveness of the ongoing TA 4271, however. Considering that it was approved in December 2003, there may be some problems with achieving its ambitious objectives. This TA, which relates to the development of high density corridors under PPP, has been delayed and the final outcome is yet to be known. Overall, ADB has made a positive contribution to the development of the enabling environment for the private sector in the transport sector.

101. **Railway Policy Development.** The completed railway reform TA led to Loan 1981, which contains a broad railway reform agenda. The ongoing TA supports the reform program, although it is not clear that it will add much value in identifying specific tasks for implementing the reforms. Both TA projects have drawn attention to the policy reforms needed to

commercialize operations, but the Indian Railways is slow to accept the scope of the recommendations and the implementation time frame.⁶¹

102. **Safety.** There was one TA⁶² for road safety, a general one, which assisted in improving knowledge, capability, and training in accident analysis, traffic engineering, and design of low-cost measures to prevent road accidents. This TA had minimal impact. None of its recommendations was implemented by NHAI.

103. Three areas for ADTA projects that ADB could usefully consider in the future are related to roads and highways:

- (i) **Road safety.** Development of a comprehensive, multidimensional, multiagency program focused on the three Es of “engineering, enforcement, and education.”
- (ii) **Road transport.** Development of a program to improve vehicle and driver licensing and testing (in particular for commercial drivers and vehicles); also, a review of current regulations and their enforcement.
- (iii) **Road construction industry.** Updating of an earlier study on the needs and shortcomings of the industry to improve the quantity, quality, and performance of local consultants and contractors.

V. ASSESSMENT OF ADB ASSISTANCE

104. This chapter assesses the general performance of ADB’s assistance to the Indian transport sector. Table 9 gives overall ratings for the sector, taking into account the ratings for the various modes of transport. Completed projects are rated mainly on the basis of validated project completion reports and project performance evaluation reports and field visits to selected projects. For ongoing projects, the ratings are based on discussions with officials of ADB and executing agency, field visits, and a review of internal ADB documents. It must be noted that the ratings for ongoing projects are based on their progress. While some conclusions can be reached about the relevance of the project and the effectiveness of implementation, it is not possible to make firm conclusions on the basis of evaluative evidence related to actual traffic, effectiveness, economic efficiency, sustainability, or impact. Thus, the rating for ongoing projects are tentative and could change, as the implementation and the factors affecting actual traffic and socioeconomic impact improve or deteriorate. The evaluation matrix on which these ratings are based is in Appendix 9.

Table 9: Bottom-Up Assessment

Subsector	Relevance	Likely Effectiveness	Efficiency	Likely Sustainability	Likely Impact	Overall Assessment
National highways	Relevant	Effective	Less efficient	Less likely	Modest	Partly successful
State highways	Relevant	Effective	Less efficient	Likely	Modest	Partly successful
Rural roads	Highly relevant	Effective	Less efficient	Less likely	Substantial	Partly successful
Railways	Relevant	Less effective	Less efficient	Less likely	Modest	Partly successful
Overall	Relevant	Effective	Less efficient	Less likely	Modest	Partly successful

Source: Operations Evaluation Mission.

⁶¹ The ongoing TA 4053, which supports the monitoring of the progress of the reform program, is managed by a team of consultants comprising senior former railway employees and external consultants. However, there appeared to be tendency among the TA consultants to rationalize the lack of progress in the reforms rather than to independently assess the reasons.

⁶² ADB. 1993. *Road Safety*. Manila (TA 2001-IND, for \$210,000, approved on 29 November).

A. Relevance

105. The relevance of ADB's assistance to India's transport sector was assessed mainly from the point of view of consistency with national development strategy and responsiveness to the country's needs (chapter III). Taking into consideration India's rapid economic growth and the resulting need to expand the transport sector (especially roads and highways), ADB's assistance for national, state, and rural roads is considered consistent with Government's plans and programs. The focus of the projects is found to be relevant to the priority areas defined in ADB's country strategies. Sector interventions were selected to help address development needs. Over time, ADB revised its programs to match requirements in line with the changes in the economy. The expansion of the program from centrally-based lending for national highways to state lending for state highways and further to rural roads enabled a clearer focus on poverty. ADB's current contribution to the national highways and rural roads program is significant (Tables 3 and 4). The selection of Madhya Pradesh and Chhattisgarh for the state highways program is relevant to the needs of these states. The rural roads program is highly relevant to the needs of the country as well as the pro-poor economic growth agenda of ADB. However, most projects were found to be lacking in quality at entry. Unrealistic project designs, inadequate readiness of executing agencies to implement the projects, and problems related to environmental and social safeguards led to this conclusion. In the railways, ADB's early interventions were connected to technology improvements, since the Indian Railways was improving in that direction. The current project is relevant to the reform program, although there is no clear strategy for the physical investment components. The railway reform program is seen as relevant from the viewpoint of enabling the Indian Railways to function along commercial lines and maintaining its share of the market. Overall, the transport sector program is rated as relevant.

B. Likely Effectiveness

106. **Roads.** In concept, road and highway assistance is seen as having a generally positive effect on the development and implementation of the country's transport program. A prime objective of the transport projects has been to increase transport capacity, which is constrained by deficient supply, inefficient operations, poor maintenance, and weak governance and management of the sector. These objectives have been addressed in many of ADB's projects and progress has been made, except in the early projects, where the implementing agencies were inexperienced and project components were spread across several states. The benefits of highway projects (compared with lower-quality roads without the project) include reduced travel time, vehicle operating cost savings, savings in fuel, less wear and tear on vehicles, and less congestion. Discussions with villagers indicated that rural roads have improved connectivity and general economic development. Such discussions as well as secondary data indicate that improved state and rural roads directly benefit the socioeconomic development of communities within the influence area of the route. The villagers attributed better access to medical facilities and education opportunities and improved social status to the road improvements.

107. An analysis of the design and monitoring frameworks for road projects approved since 1995 identified a common theme of promoting private sector involvement in the national highway projects in both road construction and maintenance. The current trends for national roads subsector indicate that this focus on private sector participation has been effective in generating additional sources of project funding and innovation. The major factor behind this positive finding was the Government's general policy shift in the sector from public funding to increasing private funding and management of projects. However, it is plausible to assert that the ADB policy

dialogue has provided some effective contributions in this area. Overall, the effectiveness of ADB's projects across the roads and highways portfolio is rated likely to be effective.

108. **Railways.** ADB's early assistance to the railway subsector generally helped increase the capacity of the physical infrastructure and rolling stock. The completed projects provided new locomotives that improved railway productivity and performance. The transfer-of-technology component helped reduce the cost of manufacturing these large, more efficient locomotives in India. The second project helped to provide the necessary capacity to handle the increasing coal traffic from mines in Bihar and helped reduce operating costs. Both these completed projects are rated effective.

109. In its more recent initiatives in railways, ADB has taken the lead in enabling structural reforms in the subsector. Considering the potential impact of the reforms, these initiatives can produce long-term benefits. However, the evidence raises concerns about when, or if, the necessary reforms will actually be implemented. Better ADB coordination and administration in this sector is needed to ensure that the intended benefits indeed arise. At the policy reform level, ADB's initiatives in the railways are rated less effective.

110. **Sector Objectives.** The effectiveness of ADB's project and TA portfolio as a whole can be assessed against the sector objectives. The first sector objective (physical infrastructure development and capacity enhancement) has been mostly achieved as a result of the sections of national highways completed with ADB support. Several issues related to the operating efficiency of the improved roads, highways, and rail sections, however, remain. Congestion is increasing and there are concerns about overall sustainability in terms of finance and maintenance. With regard to the second objective (institutional strengthening and capacity building of transport agencies), progress has also been made. Some improvements in transport sector management are evident in NHAI and Madhya Pradesh Road Development Corporation, although there are still issues regarding agency coordination, road safety, asset management, and maintenance. The last objective (poverty reduction through infrastructure-led growth) was partly achieved on the national, state, and railway projects, since such projects only have indirect impacts on poverty reduction (chapter V and Appendix 12). The poor lack the financial resources to invest in the new business opportunities resulting from better access and lower transportation costs. Their limited skills generally do not qualify them for employment in enterprises building the new infrastructure or in the new operating facilities. There is evidence to suggest that poverty-related benefits could be achieved once the ADB-supported rural roads projects are fully operating, if ADB and the executing agencies make serious efforts to address the "social inclusion" objectives of the projects.

111. Several factors contributed to the underachievement of these sector objectives: (i) overly optimistic traffic forecasts, (ii) delays in project implementation, (iii) little regard for transport network planning, (iv) primary focus on capital investment projects with insufficient social indicators for monitoring the achievements, (v) poor project design, and (vi) lack of an integrated approach to implementation. Appendix 10 discusses these factors.

112. Overall, ADB's assistance in the transport sector is **likely to be effective**, but on the lower side, subject to the resolution of the above issues.

C. Efficiency

113. For completed projects, the evaluation of the efficiency of ADB's assistance is based on the EIRR at completion. For ongoing projects, it is based on both EIRR estimates at appraisal and

implementation performance and progress as observed by the evaluation team (in mid-2006). The completed projects are rated efficient (EIRRs greater than the 12% cutoff), although one project had a borderline EIRR. For ongoing projects, the EIRRs estimated at appraisal are reasonably high and well above 12%. However, there is a common concern that implementation delays, cost overruns, and lower-than-expected traffic could adversely affect the EIRRs at completion. ADB has initiated several measures as stated in chapter IV. However, a lot remains to be done to bring the ongoing projects back on track. Since most of the transport projects are ongoing and all of them face several implementation issues, the transport sector program is rated **less efficient** in achieving the objectives of the sector assistance program in a timely manner. The rating for the ongoing projects could improve if:

- (i) measures to improve implementation are complemented with further actions to mitigate risk of delays;
- (ii) projects are completed within a reasonable time;
- (iii) there are no major cost overruns; and
- (iv) traffic on these project sections builds up to a level that will justify the use of capital to rehabilitate these roads and railways.

1. Completed Projects

114. **Roads.** The completed projects are rated efficient since their EIRRs are above the benchmark 12% rate (Table 10). However, the completion of these projects was delayed by at least 1 year and up to 4 years. Chapter IV elaborates on the implementation performance of these projects. In all cases, the EIRRs at completion were lower than those at appraisal. The difference reflects (i) an increase in construction cost, (ii) implementation delays, and (iii) lower-than-expected growth in traffic. On the policy and institutional reform side, the assistance to the road subsector was efficient in contributing to the development of the enabling environment for the private sector, as well as in setting up new institutions to implement projects.

Table 10: Efficiency of Completed Projects

Loan Number	Project	EIRR at Appraisal (%)	EIRR at Completion (%)	Project Rating
A. Roads				
1. 918	Road Improvement Project	35.7	22.4 (PCR) 20.7 (PPAR)	Efficient
2. 1041	Second Roads Project	43.1	12.4 (PCR)	Efficient
3. 1274	National Highways Project	37.0	Not available (no PCR)	Efficient
4. 1747	Surat-Manor Tollway Project	25.0	Not available (no PCR)	Efficient
B. Railways				
1. 857	Railways Project		15 (PCR)	Efficient
2. 1140	Second Railways Project	23 (average)	18 (average based on PCR) ^a	Efficient

EIRR = economic internal rate of return, PCR = project completion report, PPAR = project performance audit report.

^a The actual EIRRs were calculated separately for each project component—electrification, third line, BOXN, and unit exchange.

Source: Asian Development Bank project documents.

115. **Railways.** The railway projects faced similar issues with regard to lower EIRRs at completion compared with the forecast. The financial internal rate of return at completion for the two projects was higher than or comparable to that calculated at appraisal. In the case of Loan 857, this reflects the tax exemption granted to the Indian Railways, which offset the increase in project costs. For Loan 1140, the financial internal rate of return was recalculated using updated figures. Besides this, project used least-cost solutions indicating efficient use of capital. However, the policy and institutional reform interventions were marred by organizational inertia toward implementing some of the ADB-supported recommendations that were part of the loans.

116. Since these projects coincided with the start of ADB's involvement in India, the executing agencies had to familiarize themselves with ADB policies and procedures and ADB had to understand the sector. Good supervision and value addition by ADB staff were needed to address this problem. ADB's performance in this regard was weak. Appendix 9 gives an analysis of the individual completed projects.

2. Ongoing Projects

117. Table 11 summarizes the disbursement ratios for the active loans (as of 31 December 2006). The progress, as gauged from the amount of loan disbursed, appears to be less than satisfactory for most projects. The later loan projects became effective only in 2005.⁶³ The average time taken to make these loans effective, 12 months, suggests that transport projects consistently face start-up problems. All ongoing national highway projects continue to experience substantial delays caused by a range of preparatory activities and issues with contractors or consultants, and with safety and social concerns during and after the road improvement. The recurrent implementation delays that are common across projects are discussed in chapter IV and Appendix 6.

**Table 11: Status of Active Loans for the Indian Transport Sector
as of 31 December 2006**

Loan No.	Project Name	Approval Date	Expected/Actual Closing Date	% of Loan Disbursed	Time Required to Make the Loan Effective ^a (months)	Time from Effectiveness to First Disbursement (months)	Estimated Delay in Project Completion (months)
A. Roads and Highways							
1839	Western Transport Corridor Project	20-Sep-01	Jun-08 (revised)	72	4	2	30
1870	West Bengal Corridor Development Project	11-Dec-01	Jun-07	21	13	7	24
1944	East West Corridor Project	26-Nov-02	Jun-08 (revised)	42	13	5	18
1959	Madhya Pradesh State Roads Sector Development Project	5-Dec-02	Jun-08	32	1	16	11
2018	Rural Roads Sector I Project	20-Nov-03	Jun-08	25	14	10	18
2029	National Highway Corridor Sector I Project	4-Dec-03	Dec-07	26	14	11	22
2050	Chhattisgarh State Road Development Project	15-Dec-03	Jul-09	3	13	22	16
2154	National Highway Sector II	21-Dec-04	Dec-08	3	14	8	18
B. Railways							
1981	Railway Sector Improvement Project	19-Dec-02	Jun-08	6	22	13	30
Transport Sector Average				26	12	10	21

^a Time interval between loan approval and loan effectiveness.

Source: Asian Development Bank management information database.

118. ADB's corporate assessment of the efficiency of its operations generally revolves around the volume of loans approved each year. This approach neither reflects the disbursement levels for ongoing projects nor measures compliance with the policy for program loans. Table 11

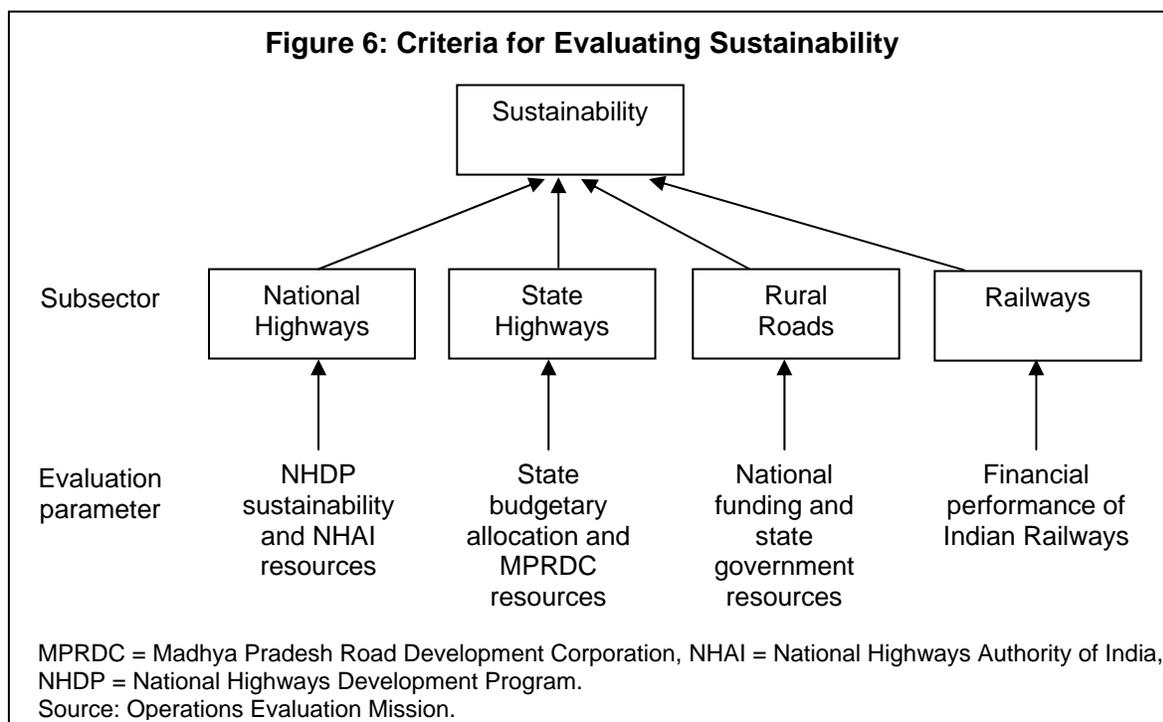
⁶³ The long interval between the date of approval and the date of loan effectiveness is a matter of concern.

shows that despite good performance in volume of loans approved, project implementation has made slow progress. ADB's *Medium-Term Strategy II* states that, to contribute more to country outcomes, ADB must shift from an institutional culture that gives priority to loan approval and lending volumes to a culture where portfolio performance and contribution to country outcomes predominate. Clearly, there is significant room for improvement in project implementation in the transport sector in India. Owing to the complexities of project and program implementation, it would be difficult to attribute all of the delays to any one party. Responsibility is shared by ADB and the executing agencies. Overall, all the ongoing projects are rated likely to be less efficient.

119. The ongoing rail project (Loan 1981) is intended to increase the commercial orientation and resolve operating bottlenecks. Besides low disbursements in the physical investment component, however, policy and institutional reforms have progressed slowly because of the Indian Railways' institutional reluctance to take major decisions. While the objective of improving the rail sector performance could partly be achieved in the future with the help of capital investment projects, the sector lacks efficiency overall, and the slow progress and uncertainty surrounding the reforms are not helping. With increasing competition between the rail and road subsectors, both the Indian Railways and ADB will have to pay more attention to maintaining the focus on sector improvement.

D. Likely Sustainability

120. Sustainability has been evaluated from two angles—funding and institutional capacity. The durability of the development gains will depend upon the resilience of the sector to mitigate the risks identified in this section. The assessment of sustainability is complicated by the fact that ADB's projects will be managed and maintained by a combination of private and public organizations. To conduct a robust assessment in this scenario involves looking at the broader picture of the Government's programs in different subsectors, using various evaluation criteria (Figure 6).

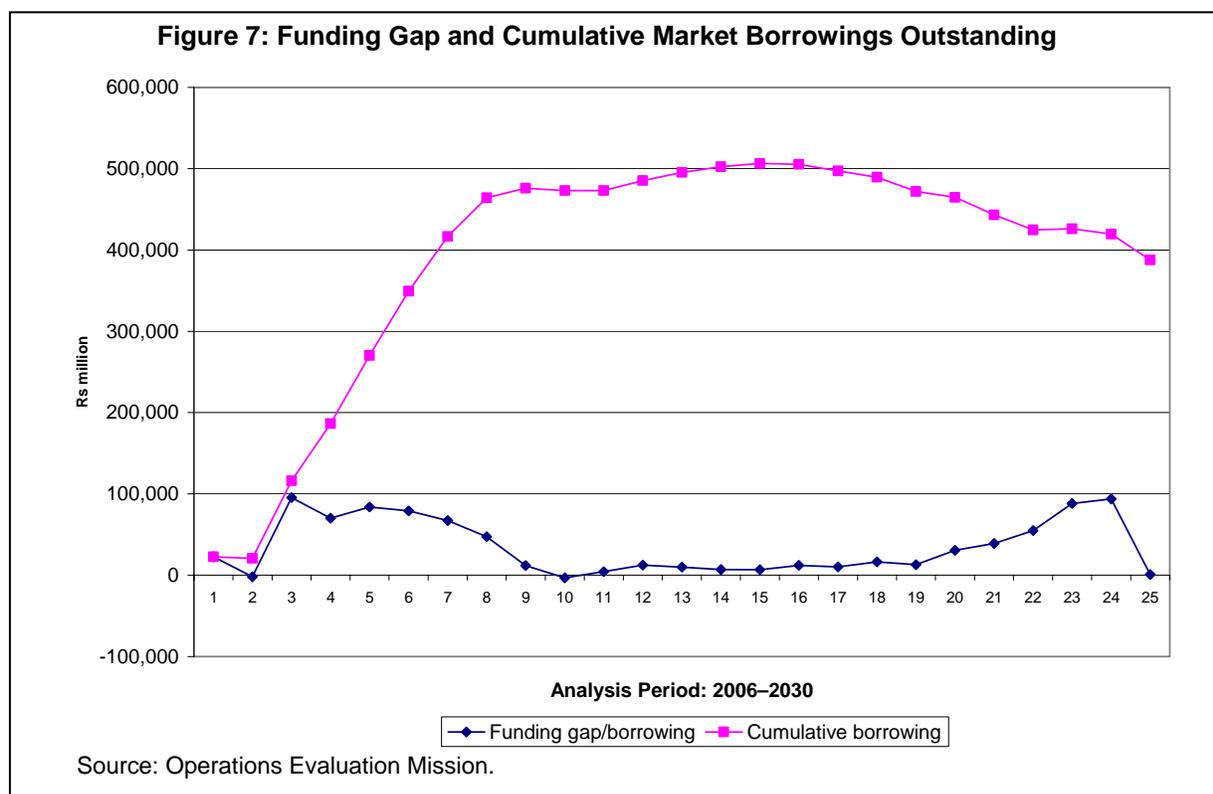


1. National Highways

121. A financial study carried out as part of this evaluation estimated the annual funding gap, cumulative funding gaps, and sensitivity tests with nominal budgetary support from the

Government besides the cess and toll surpluses, as well as charts for total fund utilization, capital and maintenance expenditures, the funding gap, and cumulative market borrowing corresponding to the cumulative funding gap. These results have been analyzed for the period 2006–2030. This was a standalone planning exercise for NHDP; it did not take into consideration the funding needs of other similar infrastructure development programs and the market appetite for long-term debt to finance infrastructure projects. NHA has been successful in inviting private sector participation. The private sector appears willing to invest in national highway projects although there may be limitations on the number of sponsors in India. If and when other competing sectors (e.g., energy, health, water supply and irrigation, pipelines, ports, railways, urban transport) are opened more widely to private sector investments, the investment flow is likely to be determined by the relative attractiveness of the competing opportunities.⁶⁴ In view of this potential limitation, there may be some doubt as to the long-term sustainability of the NHDP in terms of the operation and maintenance requirements. Appendix 11 provides further analysis of the sustainability indicators.

122. The financial study analyzed sustainability from the point of view of the funding gap and the ability of NHA to fill the gap. The analysis considered the report of the Committee on Infrastructure's NHDP core group⁶⁵ set up within the Committee of Infrastructure by the Prime Minister⁶⁶ to coordinate the financial planning for national highway development. Figure 7 shows the funding gap and cumulative market borrowings outstanding for each year of the analysis period. It assumes that NHA will carry out maintenance after the BOT concessionary period.



⁶⁴ Evidence of the growing market tightness is seen in market reports stating that NHA could not raise enough funds through the bond market in the last 3 years (Source: CRIS INFAC Report on Roads and Highways, October 2005, www.crisinfac.com).

⁶⁵ Planning Commission. 2006. *Financing Issues-Present Status: Report of the Core Group on Financing of the National Highways Development Program*. New Delhi.

⁶⁶ For more details, refer to the Committee on Infrastructure website at www.infrastructure.gov.in

123. Chapter IV highlights the deficiencies in the performance of NHAI in light of the inadequacy of its technical resources. Taking into consideration the financial constraints highlighted above and the human resource concerns, the national highway portfolio is rated **less likely to be sustainable**. Low sustainability is a major concern. The related issues must be considered by both the Government and ADB.

2. State Highways

124. In the states, although private sector participation for state highways and bridges has been initiated, government (and multilateral) sources remain the primary source of funding for long-term asset management. Few states have road funds and none are being managed on a commercial basis. Hence, securing a stable and reliable source of funds for road maintenance is a concern. The financial position of most state governments remains weak because of their high level of debt and guarantees extended to various infrastructure and other projects. Even the progressive states could find it difficult to disburse adequate funds for road rehabilitation and maintenance. In the case of Madhya Pradesh, while its fiscal deficit position has improved and the state government has been making efforts to provide adequate funds for rehabilitation and maintenance, the state government's debt obligations are a persistent issue (Appendix 11). In Madhya Pradesh, there is a funding gap of about \$44 million in the first planning years. This funding gap is expected to decrease after 2012 with a reduction in expenditure on state highways since all the state roads will have been rehabilitated by then. The funding gap could be bridged by market borrowings and from extra-budgetary resources. If the program is pursued as assumed, there exists relatively less serious threat to its sustainability unless the state dilutes its priority of road sector development or accelerates the rehabilitation of district roads and village roads under its purview, at the cost of state highways.

125. Taking into consideration the improvement in the fiscal deficit position of Madhya Pradesh, the highway projects in the state are rated likely to be sustainable. This rating assumes that continued budget allocations are supplemented with long-term funding from development partners. It is too early to assess the sustainability of state highway projects in Chhattisgarh since the reforms and project implementation are still at an early stage.

3. Rural Roads

126. The PMGSY, sponsored by the Government, is the main vehicle for developing rural roads all over the country. The planned expenditure is about \$10.56 billion (Appendix 11), while available funds from budget allocations, tax collections, and external assistance from World Bank and ADB total \$9.2 billion—a shortfall of more than \$1 billion. The Central Road Fund Act provides for the use of half of the diesel tax for rural roads, and development partners have approved loans totaling \$2.05 billion for rural roads. The funding gap of \$1.36 billion will have to be filled by the Government in the medium term.

127. Of particular concern with regard to rural roads is that once the rural program, which is fully financed by the central Government is completed, responsibility for maintenance will be turned over to the states. Besides funding concerns, local institutions may not have the human and material resources needed to sustain a maintenance regime. These major issues need to be addressed in ADB's policy dialogue. Given these uncertainties, ADB's rural road activities are less likely to be sustainable.

4. Railways

128. The operating ratio⁶⁷ of the Indian Railways reached its highest level of 98.3% in FY2000–2001, reflecting the relatively poor financial performance in year, with expenses only

⁶⁷ The ratio of total working expenses to total earnings expressed as a percentage.

slightly less than earnings. Since then, performance has improved, as a result of better use of rolling stock and changes in accounting practices. The Indian Railways is targeting an operating ratio of 77% for FY2006–2007. Despite this apparent positive development in the financial performance, the Rakesh Mohan Committee appointed in 2001 by the Government identified several areas of concern. Two of the most significant were unsustainable employee costs and the high cost of market borrowings.⁶⁸ Other issues pertained to the need for increased capacity and investments to remove bottlenecks, politically controlled (and not market-related) pricing, the lack of a customer service culture, and weaknesses in the organization structure. Reducing staff cost is perhaps the most difficult challenge. The Indian Railways carries 25% excess manpower and its ordinary working expenditure increased from \$2.6 billion in 1994–1995 to \$6.6 billion in 2001–2002. During the same period, pension charges grew 3.5 times and staff wages and salaries went up 2.6 times. Pensions, staff salaries, and wages accounted for 53% of ordinary working expenses in 2005. There has been an improvement in the traffic handled per 1,000 employees, which rose by 27% from 548 converted ton-km in 2002 to 694 converted ton-km in 2005. However, staff costs still constitute a major portion of working expenses, making it difficult to adopt commercially-oriented business practices.⁶⁹

129. The reforms⁷⁰ have not touched on the core needs of organizational restructuring, transparency in tariff mechanisms, and financial accounting improvements. The financial position improved in 2005 because of an increase in revenues (Appendix 4). However, it is not clear whether this improvement can be sustained. Without key reforms, the Indian Railways may not be able to retain its share of the transport market and to achieve sound financial results. Staff must be rationalized through effective organizational reforms. However, strong resistance to downsizing outsourcing and privatization can be expected from staff, unions, and some politicians. Ways must be found to manage the social costs associated with such programs. The overall assessment for Indian Railways is that given the recent improvement in its outlook, most of the economically viable projects are likely to be completed. Taking into account the railway's improving financial performance, the completed capital investment projects are likely to be sustainable. However, the implementation of the reform program is less likely to be sustainable unless this program is revised and made more realistic. Successful policy reforms and organizational restructuring are perceived to be the key drivers of the sustainability of ADB railway assistance. Given the limited recent progress, the railway portfolio is less likely to be sustainable overall.

E. Likely Impacts

130. A review of the literature⁷¹ found that (i) economic growth is positively affected by the stock of infrastructure assets, and (ii) income inequality declines as infrastructure quantity and quality improve. As regards transport interventions, the World Bank's Poverty Reduction Strategies Sourcebook indicates that improvements in transport have the greatest impact on poor people when other sectoral interventions are adequately in place. Without good transport,

⁶⁸ The Indian Railways claims that it is reducing its staff and has managed to keep the cost of borrowing within manageable limits. It remains to be seen if this effort can be sustained and to what extent.

⁶⁹ Source: Indian Railways Budget 2006–2007, Statistical Summary. Available: <http://www.indianrail.gov.in>

⁷⁰ The reforms, as discussed in Appendix 4, cover various commercial initiatives, capacity expansion, and improvements in freight-loading capabilities. Whether the necessary reforms are actually implemented remains to be seen, however.

⁷¹ The review included ADB and World Bank publications, among them, a recent one from ADB publication—C. Cook, T. Duncan, S. Jitsuchon, A. Sharma, and W. Guobao. 2005. *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*. ADB: Manila. Another publication that discusses the positive correlation between incremental government expenditure and poverty is S. Fan, P. Hazell, and S. Thorat. 1999. *Linkages between Government Spending, Growth, and Poverty in Rural India*. Research Report 110. Washington, DC. Available: <http://www.ifpri.org>

many other sectoral interventions are likely to be ineffective. Recent studies in India have indicated that investment in roads is ranked on top above all other public investments in terms of providing returns in poverty reduction (Table 12). In other words, roads have the maximum impact on poverty reduction. In light of ADB's overarching objective of poverty reduction, road investments are seen as highly relevant for achieving ADB's development goals. Micro-level studies have shown that improvement of roads has influenced the distributional outcomes of socioeconomic development impacts in the rural areas.⁷²

Table 12: Public Investment and Poverty Reduction

Sector for Public Investment	Ranking of Returns in Poverty Reduction in India
Agricultural R&D	2
Irrigation	7
Education	3
Roads	1
Telecommunications	
Electricity	8
Health	6
Soil and water conservation	5
Anti-poverty programs	4

R&D = rural and development.

Source: Thorat, S. and S. Fan. 2007, 24 Feb. Public Investment and Poverty Reduction: Lessons from China and India. *Economic and Political Weekly*. Available: <http://www.fanrpan.org/documents/d00240/>

131. The areas were selected to reflect a sample of all social categories and groups, which could be considered generally typical of other parts of the country. The assessment used a process of preliminary social profiling and impact analysis of the study area affected by the selected national, state, and rural roads. The assessment drew on consultations with local stakeholder groups, semistructured interviews with representatives of social groups, and a review of available secondary data to identify local perceptions of impacts. Appendix 12 gives the results of the socioeconomic study, which are summarized below.

1. National Highways

132. National highways facilitate economic growth throughout the country. Despite evidence of macro-level benefits to economic growth and development, the micro-level benefits remain limited. The socioeconomic study in communities affected by the Surat-Manor Tollway Project (Loan 1747) identified a range of benefits to the local population (Appendix 12). However, the income benefits and economic growth linkages for the poorest groups were found to be far less than anticipated at appraisal. For the lowest-income groups, because of the absence of investment resources, the national highway did not provide the anticipated level of socioeconomic change. At the same time, it is noted that highway projects are typically designed to impact the national and regional economies and it would be difficult to expect such projects to have substantial direct impact on poverty reduction. The economic benefits and opportunities created by such roads increased growth and investment opportunities for the more well-off groups by increasing asset value, reducing transportation times and vehicle operating costs, and facilitating trade and business opportunities. People living in other urban areas were also found to be investing in the rural areas along the upgraded highway, thus obtaining economic benefits from the project. These findings suggest that the likely impact of national road projects is modest, since the impact on poverty reduction at the local level has been somewhat less than expected. Case studies in Appendix 12 substantiate this finding.

⁷² Olsson, J. 2006. Responses to Change in Accessibility. Goteborg.

2. State Highways

133. The broad findings of the socioeconomic study for state highways in Madhya Pradesh indicated that the effects of improved state highways on local communities were similar to the effects of national highways, but with a few differences. Assuming that the general impacts of ADB-funded roads would not be different from those of non-ADB-funded roads, this sample provided an indicator of the likely impact of improved state highways in the country. Appendix 12 gives a before-and-after comparison of key indicators—travel cost, travel time, and frequency of transport services. The likely impact of such projects is rated as modest, in view of the limited benefits at the local level and the resettlement issues concerning people affected by the road improvements. On one project, structures of squatters were demolished with no compensation paid to them. Also, labor issues were identified in a site visit to an ongoing ADB-funded road improvement project, which supplemented the socioeconomic study. The issues ran counter to assurances made by the Government of Madhya Pradesh at the time the loan agreement was signed, that the labor code for construction workers would be adhered to, and any safety issues would be dealt with. In some instances, the contractor violated Indian Roads Congress safety requirements in road construction zones⁷³ and those discussed in ADB's report and recommendation of the President.

3. Rural Roads

134. The study assessed the role of rural roads in poverty reduction. In terms of poverty impact, rural road construction was found to contribute to reducing the income, human, and social dimensions of poverty by giving local communities better access to socioeconomic and other opportunities. However, the limited time and resources for the study meant that the actual reduction in income poverty of the local communities could not be quantified. The specific impacts of improvements in rural roads included better access to employment opportunities, increase in deposits and loans at newly established local bank offices, a decline in infant mortality and maternal mortality as a result of improved access to medical facilities, a decrease in the dropout rate in primary and middle schools and an increase in travel outside the villages by girls for high school and college education, and better prices through direct sales of agricultural crops at local markets. Given the data from the study, rural roads projects are likely to have substantial impact.

135. The evaluation found limited effective implementation of the objectives in ADB-funded projects dealing with social issues such as the spread of HIV/AIDS, transport safety, trafficking of women and children, and livelihood programs for poor communities in project areas. ADB's country strategy states that road investment projects should be socially inclusive. Relevant measures in this regard are the following: enforcing better safety standards; providing education on HIV/AIDS for truck drivers, a high-risk group; containing the trafficking of women and children; and instituting livelihood projects for resettled communities. The evaluation found very little effort to address these social issues and a lack of monitoring of progress toward the intended outcomes.

4. Railways

136. It is difficult to attribute specific impacts to ADB's assistance at the sector level in railways, since the amount of ADB assistance has been small relative to the total railway investment. Overall, however, the completed projects have had a positive impact on the railway's operating performance by increasing capacity. The transfer of locomotive technology has helped upgrade the quality of locomotives and improved efficiency on a wider scale. The ongoing project can have

⁷³ Guidelines on Safety in Road Construction Zones, IRC:SP:55:2001.

a positive impact on the Indian Railways if it is implemented efficiently, together with the associated reforms. The reforms can improve sector performance, if and when they are carried out. Overall, the impact of ADB railway projects is likely to be modest but on the higher side.

VI. ASSESSMENT OF INSTITUTIONAL PERFORMANCE

A. Quality at Entry

137. An assessment of ADB-supported transport projects across all modes, completed and ongoing, indicates that the developmental objectives were often not well defined; they were either vague or overly ambitious. Examples of vague objectives are lowering transport costs, improving road transport operations, removing capacity constraints, and improving transport efficiency. Although the developmental objectives of later loans were defined more explicitly, they were often expressed as sector objectives—reducing poverty and deprivation, providing better access to markets, creating employment opportunities and social services, and improving safety. Since any single project is likely to have relatively small impact on these broad objectives, the actual achievement of these objectives by individual projects would be difficult to measure and monitor. It is difficult to attribute the impact of these projects to the attainment of such broad objectives. This is a common problem associated with infrastructure projects in general and transport projects in particular. Chapter III identifies several implementation problems, which could have been avoided with more effective project designs. Box 7 summarizes the main hindrances in the current project designs that have contributed to implementation delays as well as lowering the development effectiveness.

Box 7: Causes of Poor Project Designs

- Unrealistic implementation schedules
- Difficult selection criteria for procuring civil works contracts
- Insufficient attention to ensuring quality of physical designs
- Insufficient appraisal of potential safeguards issues
- Insufficient capacity building components

Source: Operations Evaluation Mission.

138. From the point of view of relevance of ADB's assistance, all transport projects generally responded to the needs of the country. These needs arose from several issues across subsectors: (i) limited transport infrastructure, (ii) congestion, (iii) increased demands for higher-quality services, (iv) growing income disparities between rich and poor and between fast- and slow-growing states and areas within states, and (v) concerns relating to environmental degradation and social impacts.

139. Addressing these challenges required concerted action on three fronts. First was continued emphasis on capacity expansion and service improvement, complemented by a focus on specific geographic areas that met predefined criteria of poverty and infrastructure needs. While the national perspective remained unchanged, with ADB continuing its involvement in national highways and railways, there was a new orientation toward state and rural roads, which brought a local and regional perspective to ADB's assistance. The change broadened ADB's support and acknowledged its corporate objective of supporting pro-poor growth. Second, these investments were appropriately supplemented by policy and institutional reforms to ensure the efficiency and sustainability of infrastructure systems. While the project designs were sometimes less realistic in the railway and state road programs, the guiding principles were sound: efficient institutions had to

be developed to rehabilitate and maintain the infrastructure assets. The success of ADB's support for the development of NHAI underlines its relevance and effectiveness. Third, infrastructure development often results in environmental degradation, involuntary resettlement, and other negative impacts on vulnerable groups. ADB's safeguard policy attempted to address these issues. Overall, ADB's support covered the themes as is summarized in Table 13.

Table 13: Thematic Assessment of ADB's Support

Theme	ADB's Country Strategy (CSP)	ADB's Assistance
Removal of capacity constraints	Provide support to remove capacity constraints, promote private sector participation, and increase managerial capabilities in NHAI and state agencies	Projects approved in the last 6 years have broadly supported the strategy, although progress has varied between agencies. ADB's support has been highly relevant in addressing capacity constraints by expanding the transport network and improving the quality of the existing network.
Corridor approach in national highways	Limited to providing support to the NHDP, a similar approach within states is needed.	With two large loans approved and a third one in the pipeline, ADB's assistance is significant. Regional cooperation with other countries is absent both in the country's strategy as stated in the NHDP and in ADB's approach. However, broader political issues make regional cooperation in South Asia difficult.
Institutional development and capacity building	Development and strengthening of central and state institutions	Support to NHAI at the central level has been relevant and effective. However, the absence of a permanent cadre in NHAI reduces the effectiveness of ADB support. Strategy of improving state institutions tends to exclude the public works department, negating the comprehensive development outlook. ^a The weak capacity of private sector contractors and consultants remains a major issue.
Reforms	Support for policy reforms to promote private sector participation and efficient implementation of projects	Reforms related to roads have been generally relevant and effective in achieving the goals. In the case of railways, progress in implementing necessary reforms has not been satisfactory. There is room for improvement in clarity and specificity.
Safety and social inclusion	Support for safety and social inclusion, which gained prominence in ADB operations only in the mid-1990s although an integral part of ADB strategy, such support has not been specifically included in project designs or mainstreamed.	Few road safety measures (such as road safety audits, road safety publicity/awareness campaigns) have been included in project designs. The measures that have been included have had limited effects and have not been monitored effectively. The road safety measures have mostly been in the form of generic instructions to contractors rather than specific activities. These measures have been made operational and institutionalized only to a limited extent. Social monitoring parameters have been generally absent. ADB's rhetoric in this area has not been translated into tangible results.

ADB = Asian Development Bank, CSP = country strategy and program, NHAI = National Highways Authority of India, NHDP = National Highways Development Program.

^a A program loan for the Madhya Pradesh state road sector (Loan 1958) concerned itself with developing a subsidiary organization, at the expense of the parent public works department. A follow-on project would rectify this issue.

Source: Operations Evaluation Mission.

140. Despite the above-mentioned issues relating to project design, ADB has maintained its comparative advantage in the physical infrastructure, which has been consistent throughout the various country strategies. In its early involvement in the country, ADB decided that it lacked the necessary familiarity with the country to engage in policy reforms. Later, as its assistance grew,

institutional and policy reforms were included in road and railway operations. While continued involvement in physical infrastructure is deemed relevant, the expansion of ADB's operations to include policy dialogue is highly relevant. In a country as large as India, ADB's strategic impact will come from policy reform and knowledge-based products rather than just financing of specific pieces of transport infrastructure.

B. Contribution to Development Results

141. ADB's interventions in the transport sector have contributed indirectly to achieving development results, including poverty reduction. The broader involvement in infrastructure provision has produced economic development on several fronts (chapter V and Appendix 12). Besides physical interventions, ADB has enhanced its responsiveness to client's needs and client ownership through a flexible but consistent strategic approach to sector assistance programs, and increased policy dialogue and advisory assistance through TA over the study period. ADB's planned value added through its nonlending assistance has covered four major areas: (i) policy development (e.g., Indian Railways and private sector participation in expressways); (ii) capacity building and institutional strengthening (e.g., NHAI, Indian Railways); (iii) enhanced awareness of and compliance with social safeguards (environment, resettlement, climate change, HIV/AIDS); and (iv) road safety (e.g., fewer road accidents, weigh stations to deter overloading of vehicles).

142. ADB's operational strategy in response to the results of the midterm appraisal of the 10th FYP and the mainstreaming of poverty reduction was to orient its interventions toward combating poverty through infrastructure-led growth—on the assumption that better infrastructure would create more employment opportunities and broaden the economic base. ADB's program for 2006–2008 reflects this strategy. Infrastructure projects (transport, urban sector, and energy) account for 77% of the 3-year pipeline, and transport alone accounts for almost half of the overall pipeline. ADB's plans for the transport sector in India seek to apply lessons learned from recent portfolio implementation reviews by applying “significant and sustained effort to build capacity” in new transport projects within the states Uttaranchal and in northeastern India, which have relatively higher levels of poverty.

143. While the above strategies have the potential to contribute positively to the development results, poor implementation performance combined with unsustainable ADB assistance could dilute this contribution. Overall, the contribution to development results is rated modest.

C. Assessment of ADB Performance

144. ADB has helped shape parts of the transport sector in India, although this is an initiative that is clearly led by the Government. Over the past 20 years, ADB has provided consistent support for the transport sector (excluding urban and air transport and, until recently, inland waterways transport), in the process helping reduce capacity constraints on the national highways and rail systems, and at some major ports, promoting growth in private sector participation and, indirectly, facilitating economic growth. ADB has generally responded to the needs of the sector by adjusting its strategies and policies to keep in step with changing needs and the Government's FYP. However, ADB operations have largely reacted to situations, rather than helping the Government to develop forward-looking strategies based on sound analysis. Together they could identify a multimodal, integrated approach to attain an efficient balance between the capacity of transport modes and user demand. The formulation of specific ADB transport sector projects has been beset by overly optimistic demand forecasts, overly ambitious objectives, and consistently unrealistic implementation schedules and institutional capacity. There have been several

contributory factors: (i) inadequate ADB appraisal and due diligence, partly because of the limited resources devoted to project preparation stage; (ii) limited experience of ADB staff in specialized areas such as transport sector analysis, policy reform, transport management, institutional capacity building, road safety, and socioeconomic aspects; (iii) demand forecasts based on overly optimistic forecasts of economic growth, population, and vehicle ownership growth; and (iv) inability of ADB to learn from past experience to improve the design of future projects.

145. One issue has been the relatively small number of ADB staff involved with the India transport sector program in the new millennium, given the size of the sector, its scope across all modes, and complexity (involving policy reforms, institutional capacity building, complex government procedures, procurement, social and environmental issues, and a range of specialist subcomponents). ADB's South Asia Infrastructure Division processed almost half of ADB loans (in number and amount) in 2001–2004.

146. In 2001–2002, ADB committed to increasing its lending to India to support the country's rapid economic growth. The transport sector was seen as one of the sectors in which ADB lending would increase significantly. As a result, the volume of transport loans approved increased sharply, and by 2003 transport loans to India accounted for half of all transport loans to the Asian region. However, the number of staff involved in the Indian transport sector remained unchanged. Staff resources were overloaded as the level of projects that had to be processed and administered exceeded the institutional capacity.

147. In such circumstances, it is unlikely that ADB's professional staff have been allocating enough time to either loan processing or project administration. According to a 2004 study of ADB's resource requirements, ADB's Budget, Personnel, and Management Systems Department estimated that 75 staff-weeks are needed to process an infrastructure loan. However, loans to the transport sector in India have been processed in much less time. This may be a measure of high efficiency, but it could also indicate that not enough attention is given to structuring appropriate project designs, making sufficient preparations with the executing agencies, and generally making robust appraisals. The latter interpretation would be consistent with the continuing long start-up delays for Indian transport projects. Evaluation findings indicate weaknesses in quality at entry (e.g., excess period required for loans to take effect, weaknesses in project design, poor selection of subprojects for sector loans). These findings suggest that ADB has focused more on the volume of loan approvals than the achievement of development results.

148. Loan administration responsibilities are split between ADB headquarters and the India Resident Mission transport specialists. This arrangement has been evolving. The Government has requested that more transport sector projects should gradually be assigned to the Resident Mission. In theory, ADB could thus respond better to executing agency requests for information, meetings, and decisions on projects. ADB and World Bank transport sector portfolios in India are about the same size. However, the World Bank has eight transport specialists in its Delhi office and three in Washington. ADB has one full-time transport specialist in the Resident Mission, and two national staff members to support him. In Manila, ADB has five transport specialists, who have loan processing and administration responsibilities in several other South Asian countries besides India. This comparison indicates that ADB lacks adequate frontline transport staff in the India Resident Mission. The effects of this staffing situation are that, with three transport specialists having responsibility for administering 15 projects with the Resident Mission, the concerned staff had to undertake fewer and shorter field missions. In addition, they have to participate in four transport portfolio review meetings each year, when meetings are held over 3 days with executing agencies and the Department of Economic Affairs to review progress on the transport projects.

149. Besides the number of staff, the expertise of ADB staff has been found to be less than adequate for managing complex implementation issues. Consultations between ADB and the Government⁷⁴ have indicated that the high turnover of ADB staff and the fielding of mission leaders without adequate experience and technical knowledge have resulted in low-quality project designs and implementation delays. Issues related to the number of staff and skill mix extend far beyond a division, regional department, and vice president. This is a corporate issue. The finding of this evaluation is that rigidities in the system have prevented ADB from matching its human resources to the need to adequately process and administer a growing portfolio and to provide an important client with the level of service that it should expect. Taking into account the weaknesses in project design and the severity of implementation delays that appear to be associated with an inadequate level of human resources and skill mix, ADB's performance is rated only partly satisfactory.

150. ADB will need to decide whether it is practical to continue to increase the size of its operations in the Indian transport sector, in light of the human resource constraints. If ADB cannot strengthen its resources, then it must limit its future assistance in this sector to a level that is consistent with its human resource capacity. Such decisions must include adequate project administration as well as sound project processing. If the current pipeline is to be maintained or increased, ADB will need to ensure an overall expertise that covers the areas listed in Box 8. Besides, ADB will need to build a team of experts with experience in these areas gained outside ADB as well as sufficient project processing and project administration experience within ADB.

Box 8: Fields of Transport Sector Expertise to be Built Up in the Asian Development Bank

- | | |
|---|--|
| • Policy dialogue, capacity building | • Road engineering |
| • Financial analysis | • Railway expertise, including engineering |
| • Resettlement | • Transport economics |
| • Environment | • Portfolio management |
| • Private sector participation in transport | • Procurement and project administration |

Source: Operations Evaluation Mission.

VII. OVERALL ASSESSMENT

A. Assessment of ADB Assistance (Bottom-Up)

151. The rating for the completed assistance is based on the validation of available evaluation evidence and field visits to sample projects. The rating for ongoing assistance is based on discussions with officials of ADB and the Government, field visits, and a review of ADB progress reports. The ratings for the ongoing portfolio could change with variations in the implementation efficiency of both ADB and the government agencies, and are intended to draw attention to current challenges rather than to pass a judgment on performance after project completion (see chapter V for details).

152. Table 14 summarizes the overall assessment⁷⁵ of the road and railway categories covered in the evaluation. Appendix 9 provides details of the project ratings.⁷⁶

⁷⁴ A consultation mission to India obtained feedback on the partnership framework for middle income (ordinary capital resources) countries in January 2005. Correspondence between the Government and ADB in December 2004 also referred to this issue.

⁷⁵ In an evaluation matrix (Appendix 9), these ratings are quantified on the basis of the weight of each subsector given the volume of loans is provided to it.

⁷⁶ Sector performance (bottom-up) is rated as follows: highly successful, a score of 20 or higher; successful, 16–19; partly successful, 11–15; and unsuccessful, 10 or less.

Table 14: Overall Rating—Bottom-Up

Subsector	Weight (% of total)	Relevance (scale of 0–3)	Likely Effectiveness (scale of 0–6)	Likely Efficiency (scale of 0–3)	Likely Sustainability (scale of 0–6)	Likely Impact (scale of 0–6)	Overall Rating	Description
Roads and highways	45	2	4	1	2	2	12	Partly successful
	26	2	4	1	3	2	13	Partly successful
	10	3	4	1	2	4	14	Partly successful
Railways	19	2	3	1	3	2	11	Partly successful
Overall Project Rating	67	2	4	1	2	3	12	Partly successful
TA Rating	33	3	3	2	3	3	15	Partly successful
Bottom-Up Sector Total		2	4	2	3	3	13	Partly successful

TA = technical assistance.

Source: Operations Evaluation Mission.

1. Relevance

153. All the projects were relevant in maintaining focus on the priority areas defined in the country strategies (chapter III). This rating is based on several factors. First, the sector strategy was consistent with ADB's overall goal of promoting pro-poor growth and with the country's evolving priorities. In the first years of ADB involvement, the expansion of physical infrastructure was seen as the priority by both ADB and the Government. The initial strategy and projects were consistent with this thinking. But as the growing importance of policy changes was recognized, the focus was broadened to include institutional and policy reforms. Second, the assistance to the sector was adjusted to take into account the growing private sector participation. This was a positive change. Third, ADB's assistance has traditionally focused on physical infrastructure, which is seen as its comparative advantage. This orientation continues, albeit on a more comprehensive scale that includes policy dialogue. Finally, harmonization with other development partners has been limited to macro-level geographic distribution of activities. While this approach is relevant to the needs of the country, there is room for further improving this harmonization to cover policy dialogue and program implementation.

2. Likely Effectiveness

154. The rating for the likely effectiveness of road and highway projects is based on an analysis of the benefits associated with similar roads as well as the situation without such projects in Chhattisgarh, which has yet to experience a substantial infusion of funds. Since most of the projects are ongoing, this rating is tentative and could change when the actual achievements are known. The completed projects have effectively achieved their objectives. However, because of the observed implementation deficiencies discussed in chapter IV, these projects cannot be considered highly effective. Road improvements, in general, result in reduced travel times, vehicle operating cost savings, fuel savings, and reduced congestion. Rural roads are expected to provide better access and several socioeconomic benefits.

155. While ADB railway assistance has effectively contributed to improving freight handling capacity, the actual size of ADB's funding is small compared with the overall requirements. The crucial test of effectiveness lies in the implementation of the current reform program, which has been delayed. The record of the Indian Railways in implementing reforms has been poor, although there has been some progress in the recent years. This slow implementation of reforms reflects two factors: (i) unrealistically designed reform packages, and (ii) a lack of organizational capacity and direction to implement the reforms. While the assistance for physical investments is expected to improve rail services, slow progress on the reform program could reduce the overall benefits of ADB assistance. Overall, in the transport sector, taking into consideration the projects completed and assuming that the ongoing projects are completed efficiently, the assistance is likely to be effective, but on the lower side.

3. Efficiency

156. For the few completed projects, the EIRRs at completion were lower than those estimated at appraisal, although the EIRRs in all cases were higher than the 12% benchmark for satisfactory performance. Increased construction costs, delays in implementation, changes in maintenance costs, and lower traffic forecasts contributed to the lower-than-expected but still acceptable EIRRs. The fact that the EIRRs were higher than 12% would imply a reasonable efficiency of the capital invested in the projects. The delays in implementation ranged from 1 year to 4 years, with an average delay of 2.4 years. ADB-supported transport projects in India experienced longer project implementation delays on average than those in the People's Republic of China and Sri Lanka.⁷⁷

157. Most of the road and highway projects are ongoing. All the active projects suffer from low disbursements caused by start-up delays, procurement issues, and construction problems (chapter IV). Poor project design and difficulties in addressing safeguard issues have further delayed implementation. This is true of the railway project as well. In view of the general implementation problems experienced, the Indian transport sector portfolio is rated likely to be "less efficient." This rating may improve provided steps are successfully taken to improve project implementation and to implement necessary sector reforms.

4. Likely Sustainability

158. Considerable progress has been made in NHDP and the State Highway Program, but is less evident in the rural road program. The main challenge is to ensure that the current pace of the various programs improves with assurance of adequate funding for the pipeline of projects planned at the central and state levels (section D, chapter V). In parallel, there is a need for a systematic approach to maintaining the networks, including securing the required levels of maintenance financing, and building the necessary capacity and systems. For roads whose maintenance has been assigned to government agencies, there may be difficulties in ensuring the availability of reliable funding, human resources, and materials for road maintenance. Contractor capacity and capability presents another challenge to sustainability. On the Government's side, there are concerns regarding the sustainability of ADB's institutional capacity-building efforts, particularly when employees are on deputation from other government agencies. These concerns about sustainability reflect evaluation findings at the policy, organizational, and project levels. Railway assistance sustainability revolves around policy and organizational reforms, which appear to be less likely to be sustainable. But this sustainability

⁷⁷ The average delay in loan closing in the People's Republic of China is 1.23 years and in Sri Lanka, 1.81 years.

rating is based on the current situation and it could change with shifts in policy and improvements in administrative and contractual capabilities. For example, a change in the toll policy or the tax regime could generate more funds for the national and rural roads programs. Overall, the transport sector assistance is less likely to be sustainable.

5. Likely Impacts

159. Despite evidence that transport projects contribute to general economic growth and indirectly to poverty reduction, the potential impact of the completed outputs appears to be modest, given the concerns about the efficiency and sustainability of the assistance. National and state highways are likely to make satisfactory contributions to the national and regional economies. With the national economy growing rapidly, the economic contribution of highways is positive. All the completed projects, ADB as well as non-ADB funded, have experienced growth in traffic. Road improvements may have had a negative impact on small businesses along the road alignment because road improvements resulted in better traffic flow and a loss of business, yet highways have contributed to the enabling environment for economic growth and livelihood opportunities (section E, chapter V and Appendix 12). In the case of rural roads, the impact on employment opportunities, access to credit, access to health and education facilities, farm-gate prices, and access to urban areas has been generally positive. Not all of these impacts can be solely attributed to road improvements, however. The presence of an all-weather road is a necessary but not sufficient condition for the improvement of local socioeconomic conditions. Overall, the impact of rural roads and highways assistance is likely to be modest to substantial. In the case of railways, it is difficult to attribute specific impacts to ADB assistance or to any single project. But improvements in the railway capacity have had a positive impact on its ability to carry more traffic and thus contribute more to the national economy. There is no evidence yet that ADB's railway policy reform agenda has had a substantial impact on Indian Railways. Although ADB's assistance has contributed positively to improving the development conditions, it needs to be acknowledged that its impact is modest in comparison to the overall needs of the country and the interventions from the Government itself. Overall, potential contribution of the ADB assistance is seen as modest but on the higher side.

6. Overall Bottom-Up Assessment of ADB Assistance

160. Overall, given its ratings on the five criteria discussed above, ADB's transport sector program in India is considered only partly successful. The program has appropriately adjusted its operations to reflect the changing the needs of the country. All completed projects have achieved their expected outputs with satisfactory quality, though with delays in implementation, time overruns, and reductions in scope. All ongoing projects have encountered implementation problems. It remains to be seen if the ongoing efforts to address implementation problems will succeed. Upon completion, the projects are expected to provide the intended benefits. Policy changes related to financing, particularly for maintenance, could deal with sustainability concerns.

B. Assessment of Strategic Performance (Top-Down)

161. This section assesses ADB's strategic performance along three dimensions: (i) sector positioning and quality of entry of country strategies, (ii) contribution to development results, and (iii) ADB's performance. Although there would appear to be a certain degree of overlap between these indicators and those used in the bottom-up assessment, different indicators were used to evaluate performance in the top-down approach. Table 15 gives the ratings for the top-down indicators.

Table 15: Summary Rating of Strategic Performance

Item	Score (scale of 0–8)	Rating
Sector positioning and quality of entry	6	Substantial
Contribution to development results	5	Modest but on the higher side
ADB's performance	4	Modest
Total Score	15	Successful

ADB = Asian Development Bank.

Source: Operations Evaluation Mission.

162. **Sector Positioning and Quality of Sector Entry.** ADB's strategic selection of subsectors and priority areas over the three phases of its involvement in the Indian transport sector is significant and appropriate to the needs of the country (chapter III). The broadening of the strategy from a physical infrastructure focus to support for policy reform, particularly the development of private sector participation and capacity building, supports this rating. The concentration on roads and highways was consistent with and relevant to the Government's national development plans, but the planned diversification into inland waterways was not based on sufficient analysis. The entry into the port sector and the subsequent exit was logical. The positioning of ADB in the railway subsector is appropriate, but the implementation, both of policy reform and of physical infrastructure, has been fraught with problems, caused partly by poor project design. The quality of entry across all parts of the transport sector was ambitious and challenging (chapter VI). As with all infrastructure sectors, attributing broad socioeconomic development impacts to specific transport sector interventions is difficult. More realistic and perhaps more modest program designs that have clear links with the outputs and the likelihood of achieving the outcomes are required. ADB's overall strategic positioning in the transport sector in India is rated as substantial.

163. **Contribution to Development Results.** There is an indirect link between the development of transport infrastructure and poverty reduction. ADB's strategy in the transport sector in India has focused on improving the quality and capacity of the road and railway infrastructure. This strategy was sound, as the enabling environment for economic development had to be created in the local and regional contexts. Several studies, including the socioeconomic study conducted as part of this evaluation, show that better transport infrastructure is positively correlated with pro-poor growth and development (footnote 71). ADB's value added in the road subsector has been significant in policy development, institutional strengthening, encouraging private sector participation, promotion of public awareness of social and environmental safeguards, and attention to related issues. But ADB's value addition in the railways subsector is not clear. The poor implementation performance of ADB assistance, outlined in chapter IV has reduced the potential contribution to development results. In the case of rural roads, the correlation between road improvement and economic development is strong at the local level. Improved national and state highways also support economic development, although the impact is indirect and felt more at the regional and national levels (section E, chapter V and Appendix 12). On the other hand, highways are seen as detrimental to the lowest-income groups. The lack of adequate provision for social inclusion in the project designs affected the contribution to development results. Overall, although ADB's transport sector strategy has had substantial indirect but positive contribution to development results, its downside reduces the overall rating to modest, albeit on the higher side.

164. **ADB's Performance.** The Government and other development partners appreciate ADB's assistance to India's transport sector. However, the implementation issues facing the projects have diluted ADB's position as the prime transport sector development partner. Similar

problems related to implementation confront the World Bank. ADB's efforts to increase lending volumes in the early part of this decade were successful. However, there was no complementary deployment of staff resources (section C, chapter VI). Government agencies have pointed out deficiencies in the quantity and quality of ADB staff working in the transport sector. Although this issue could in theory be addressed by ADB, the wider implementation issues causing delays require a more comprehensive dialogue with the Government. Issues relating to compliance with environmental and social safeguards as well as the harmonization of procurement procedures have wider ramifications. Overall, taking into account the extent of implementation delays and the constraints on staff resources, ADB's performance has been modest.

C. Overall Rating of All Levels of Performance

165. The overall performance of ADB's transport sector program, combining the bottom-up and top-down assessments, has been only partly successful, but on the higher side (Table 16).⁷⁸

Table 16: Overall Rating of Performance Assessment at the Sector Level

Item	Score	Rating
ADB assistance	13	Partly successful
Strategic performance	15	Successful
Total Score	28	Partly successful, but on the higher side

ADB = Asian Development Bank.

Source: Operations Evaluation Mission.

VIII. ISSUES AND RECOMMENDATIONS

A. Main Issues Identified

1. Implementation of Policy Reforms

166. Policy reforms and plans to restructure the various Indian transport agencies are being developed to better rationalize the planning, policy making, regulatory, and operating aspects of transport systems. Once these reforms and plans are fully implemented, the public sector is expected to be more responsive and accountable for administrative facilitation (planning, policies, and regulation). Private sector involvement in project executions and the provision of transport services should increase. A pragmatic reform agenda must be identified for each state that reflects the local context and ensures that the reforms and the anticipated time frame are realistic, given the institutional and political economy constraints.

167. ADB and the Indian Railways had developed an agenda for policy reforms that involves adopting commercially-oriented operating systems (chapter IV). Progress on implementing these reforms has been slow and, despite earlier efforts in the 1980s and 1990s, the Indian Railways has achieved less than its full potential. With the growing freight demand and increase in modal competition for passenger traffic, Indian Railways faces several challenges in terms of restructuring and further improving its financial and operating performance. To do so would require a more commercial orientation and the ability to deal with difficult problems like accounting systems, overstaffing, and organizational restructuring.

⁷⁸ Sector performance (overall) is rated as follows: highly successful if the score is 40 or higher; successful, 30–39; partly successful, 20–29; and unsuccessful, 19 or less.

2. Coordination of Institutions

168. Despite the fact that ADB has been working with various government institutions, there is little evidence to suggest sufficient coordination among concerned institutions (chapter IV). There is little interaction between the NHAI and the Ministry of Rural Roads, although both national highways and rural roads are centrally funded. There has been insufficient coordination between the NHAI and the various State Governments, causing delays in land acquisition. There is little consideration at the technical level of coordination or collaboration with other modal agencies, e.g., interaction between roads agencies and Indian Railways is very limited. Thus, the possibility of the Indian Railways offering “door to door” service—incorporating rail or waterway transshipment services, or piggyback container services with containers on road trailers transported by rail to ports—has not been considered, except perhaps by the Planning Commission, while preparing the FYPs. Similarly, the interface between agencies dealing with national and state highways and those dealing with major urban roads and urban transport service needs are not taken into account in planning by NHAI, the states, and urban authorities. The long-term strategic goal should be to develop and capitalize on synergies through a more integrated multimodal system to lower logistical costs for transport users. ADB needs to undertake a more intense policy dialogue to encourage better coordination among these institutions.

3. Limitations of the Construction Industry

169. The infrastructure construction industry (contractors and consultants) is having difficulty in coping with the large amount of civil works contracts for the massive infrastructure rehabilitation efforts in India, including its transport sector. Given the demands associated with the road construction programs which are set to continue until 2012 and beyond, and the PPP schemes which will run for 20–25 years, the industry needs to be strengthened for the program targets to be achieved. The strengthening process must recognize that India’s university students and graduates have competing career opportunities, many of which offer higher salaries and other benefits. The industry and the Government may have to consider offering incentives to make the construction industry more attractive to new graduates.⁷⁹

4. Safety of Transport Systems and Services

170. A recent paper⁸⁰ reported that road traffic fatality rates (fatalities per 10,000 vehicles) in India have decreased steadily, from 18.3% in 1999 to 12.8% in 2003.⁸¹ However, 12.8% is still about 10 times the average fatality rate in member of the Organisation for Economic Co-operation and Development, all of which have developed and implemented multidimensional road safety programs. In India, 86,000 persons, or about 10 people every hour, were killed in road traffic accidents in 2003, according to official records. A Planning Commission in 2000 estimated the social cost of traffic accidents at 3% of GDP. Appendix 8 elaborates on the gravity of this issue.

171. India does not have a systematic and uniform process of collecting, analyzing, and interpreting traffic accident data. Road safety audits conducted as part of road improvement

⁷⁹ An ongoing World Bank study is examining the supply side constraints in the Indian construction industry.

⁸⁰ Mishra, S.K. (Director for Road Transport, MoSRTTH). 2006. Road Safety in India. Presented at an ESCAP Conference, Bangkok, May.

⁸¹ The World Bank (according to the same source) quotes a fatality rate of 20.3% for 2003 and other recent documents suggest that official traffic accident figures could be underreporting the number of traffic fatalities by almost 60%.

schemes (including ADB-funded programs) range from the superficial (as in the detailed project reports) to the comprehensive (as in the Western Transport and East-West Corridor projects).⁸² However, at present, audits are done only once during the development of a road improvement scheme (and not at all before construction). Their recommendations may or may not be acted on. The experience in other countries indicates that the use of seatbelts and infant seats, driver training and education, vehicle safety inspection, blackspot analysis, and better enforcement contribute to improved traffic safety. The seriousness of the road safety situation in India has been recognized and consideration is being given to establishing a more focused, coordinated road safety program led by a centralized, dedicated organization with a reliable source of funding. If this plan is effectively implemented, it would be a positive step toward improving traffic safety.

5. Climate Change

172. Economic growth, urbanization, economic liberalization, rising incomes, and higher aspirations of people living in India have all led to increased mobility and greater motor vehicle ownership.⁸³ As a result, transportation sector greenhouse gas (GHG) emissions are increasing. Addressing this issue will require action on many fronts. Policy interventions can be used to reduce transport GHG emissions. Examples would include adopting fuels with lower GHG emissions; reducing fuel consumption per passenger- or freight-km traveled; increasing the distance traveled per unit of fuel for individual vehicles; using taxes, incentives, and fiscal instruments to encourage environmentally friendly behavior; ensuring that the cost of pollution is borne by the polluter; and better spatial planning, particularly in urban areas. On the project implementation side, ADB has been working with the Government in developing environmental safeguards systems that are better aligned with the country's priorities and procedures (section B, chapter III). These need to include mechanisms for climate change impact mitigation.

173. A recent ADB workshop, "Climate Change Mitigation in the Transport Sector,"⁸⁴ developed projections of energy demand in the transport sector in several developing member countries. The forecast energy use reflected the growth in the number of vehicles, increased use of vehicles, the fuel efficiency of vehicles, and fuel energy intensity. The workshop estimated that energy use by the transport sector in India would grow by 5–8% yearly. Over the next 20 years, the demand for energy would more than treble. While the rhetoric on this issue has been growing, the development partners, including ADB, must work with the Government to address GHG emissions in future operations in the Indian transport sector.

B. Recommendations for Future Assistance

174. The evaluation of ADB's assistance program to the Indian transport sector has identified several broad problem areas. For ADB, these are related to weaknesses in project design, project administration/supervision, and staffing, as well as pervasive implementation delays. For the Government, the problem areas include lack of coordination among transport agencies, delays in project implementation, and inadequate provision for social inclusion in project designs. The following recommendations (Table 17) address these areas and provide directions for prioritizing ADB's sector positioning.⁸⁵ These recommendations are put forward as directional inputs to the preparation of a new country partnership strategy.⁸⁶

⁸² Road Safety Audit of Select National Highway/Expressway Sections of Western Transport Corridor and Part of East-West Corridor under NHDP – Package B, SPAN-FINNROAD-CONSIDIA JV, October 2005.

⁸³ ADB. 2006. *Energy Efficiency and Climate Change Considerations for On-Road Transport in Asia*. Manila.

⁸⁴ ADB. 2006. *Workshop on Climate Change Mitigation in the Transport Sector*. Manila.

⁸⁵ These recommendations have been discussed with ADB's operations department.

⁸⁶ Appendix 13 summarizes the issues and recommendations of a recent evaluation carried out by the World Bank's Independent Evaluation Group.

175. ADB needs to continue its interventions in the roads and highways subsectors, refining them by providing a focus on the relatively less developed states especially in the north-eastern part of India. This will need to be accompanied by measures taken to learn from past experience to address problems typically experienced across the country. Because of the positive development impacts associated with state highways and rural roads, ADB should continue to support projects, policies, and institutions in these areas. ADB's current inclination to provide assistance in viability gap funding for the NHDP needs to be continued. Such projects that have satisfactory economic returns are suitable for ADB supported public sector financing.

Table 17: Recommended Improvements in ADB's Assistance Program and Strategic Positioning

Recommendation	Responsibility	Timing
A. Recommendations for Improving Project Implementation		
1. Implementation Delays. ADB must work more closely with the EAs to identify and resolve problems that lead to implementation delays, both in individual projects and at the strategic level. Specific recommendations for addressing implementation delays are provided in the appendix.	SARD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
2. ADB Supervision. ADB should give at least equal emphasis to good portfolio management and volume of loan approval. ADB's project administration in the transport sector must improve in frequency and quality. This may involve transferring more loan administration responsibilities to ADB's India Resident Mission. Doing so would require the India Resident Mission to be adequately staffed. Alternatively, ADB headquarters staff could interact more closely with the EAs to identify and resolve problems at an early stage.	SARD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
3. ADB Staffing. ADB must find ways to match the number and quality of staff to the increasing level of transport operations and ensure that the staff have adequate and appropriate experience and skills.	SARD and BPMSD	Ongoing. Implementation delays should be a focus of the next Country Portfolio Review Mission.
4. Project Designs. Project design quality at entry must be improved. Project designs must take into account local variations in implementation capabilities and make better use of past experience to improve the design of future projects. In particular, the implementation schedules need to be better estimated.	SARD	From the first Indian transport project loan presented to the Board for approval in 2008.
B. Recommendations for Prioritizing ADB's Strategic Positioning		
5. Support for Private Sector Participation across All Transport Modes. ADB support for policy reforms to promote private sector involvement in the transport sector should continue, at a higher level. Innovative contract arrangements could be developed to maximize the benefits of private sector participation such that it not only replaces public financing but also improves the quality of services. In particular, there are concerns about the long-term sustainability of the NHDP. To address this, ADB should assist the Government in developing an action plan that uses an appropriate mix of public and private funding, e.g., viability gap funding should be encouraged.	SARD and PSOD	During the preparation and implementation of transport sector strategy and road map under the new country partnership strategy.

Recommendation	Responsibility	Timing
<p>6. Reassessment of the Approach to Policy Reforms in Indian Railways. The railway policy reform program was formulated in 2002–2003. It is time to review the approach in light of the changed environment and delayed progress. While the basic goals of the reform program are robust, the approach to achieving those goals has yet to achieve the desired results. ADB should engage in policy dialogue with the Government and the Indian Railways to rework the reforms agenda and to identify a specific road map for developing further commercial orientation in the operations.</p>	SARD	During the preparation and implementation of transport sector strategy and road map under the new country partnership strategy.
<p>7. Strengthen Policy Dialogue. ADB should broaden its policy agenda in the transport sector to include a more intensive dialogue on (i) road safety, (ii) sector governance and corruption, (iii) institutional coordination, (iv) mitigate climate change impacts, and (v) achieving socially inclusive objectives. ADB could take steps to work with the Government on developing specific action plans for each of these themes. Road maps, as stated in the country partnership strategy, need to be supplemented with appropriate social parameters. At the same time, there is a need to mainstream these into project designs with specific indicators. ADB could provide specific technical assistance under these broad themes.</p>	SARD	During the preparation and implementation of transport sector strategy and road map under the new country partnership strategy.

ADB = Asian Development Bank; BPMSD = Budget, Personnel, and Management Systems Department; EA = executing agency; NHDP = National Highways Development Program; PSOD = Private Sector Operations Department; SARD = South Asia Department.
Source: Operations Evaluation Mission.

ASIAN DEVELOPMENT BANK LOANS AND TECHNICAL ASSISTANCE, 1987–2005

Table A1.1: Loans and Investments

Project Reference Number/Title		Amount (\$ million)	Approved	Current Status	PCR	PPAR
1. Roads: National Highways						
1274	National Highways ^a	245.00	1993	Closed	—	—
1279	Bombay-Vadodara Expressway Technical Assistance	12.70	1993	Closed	Loan was canceled	
1747	Surat-Manor Tollway ^b	180.00	2000	Closed	2006	—
1839	Western Transport Corridor ^c	240.00	2001	Active	—	—
1944	East-West Corridor ^d	320.00	2002	Active	—	—
2029	National Highway Corridor (Sector) I ^e	400.00	2003	Active	—	—
2154	National Highway Sector II ^f	400.00	2004	Active	—	—
2. Roads: State Highways and Rural Roads						
0918	Road Improvement ^g	198.00	1988	Closed	1999	2002
1041	Second Road ^h	250.00	1990	Closed	2000	—
1870	West Bengal Corridor Development ⁱ	210.00	2001	Active	Loan was reduced to \$79.2 M (Nov-05)	
		(79.20)				
1958	Madhya Pradesh State Roads Sector Development Program (Program Loan)	30.00	2002	Active	—	—
1959	Madhya Pradesh State Roads Sector Development Program ^j (Project Loan)	150.00	2002	Active	—	—
2018	Rural Roads Sector I ^k	400.00	2003	Active	—	—
2050	Chhattisgarh State Roads Development Sector ^l	180.00	2003	Active	—	—
3. Railways						
0857	Railways	190.00	1987	Closed	2000	—
1140	Second Railways	225.00	1991	Closed	2000	—
1981	Railway Sector Improvement	313.00	2002	Active	—	—
4. Ports, Waterways, and Shipping						
0842	Ports Development	87.60	1987	Closed	1993	1996
1016	Second Ports	129.00	1990	Closed	1997	2002
1181	Coal Ports	285.00	1992	Closed	2003	—
1556	Mumbai and Chennai Ports	97.80	1997	Closed	—	—
1557	Mumbai and Chennai Ports	15.20	1997	Closed	—	—
Total		4,558.30				

— = not available, PCR = project completion report, PPAR = project performance audit report.

^a Six sections, four-laning/strengthening, total length 333 kilometers (km), in Andhra Pradesh (national highway [NH]9), Jharkhand (NH2), West Bengal (NH2), Haryana (NH8), and Rajasthan (NH8).

^b Three sections, four-laning/strengthening, total length 175.6 km, all in Gujarat (NH8).

^c Five packages, four-laning/strengthening, total length 259.1 km, all in Karnataka (NH4).

^d Five sections, four-laning/strengthening, total length 504.6 km, all in Gujarat (NH8A, NH8B [2 sections], NH14, NH15).

^e Five continuous sections, four-laning/strengthening, total length 662 km, in Rajasthan (NH76), Madhya Pradesh (NH25, NH76), and Uttar Pradesh (NH25, NH76).

^f Four packages, four-laning/strengthening, total length 566.3 km, in Uttar Pradesh (NH26), Madhya Pradesh (NH26), and Andhra Pradesh (NH76 [2 packages]).

^g (i) NHs, four-laning/strengthening 111 km Haryana and Uttar Pradesh (NH2), 46 km Andhra Pradesh (NH5); (ii) State highways (SHs), improvements 216 km Andhra Pradesh, 132 km Karnataka, 160 km Tamil Nadu.

^h (i) NHs, four-laning/strengthening 25 km Tamil Nadu (NH7), 47 km Kerala (NH47), 69 km Rajasthan (NH8); (ii) SHs, widening (two lanes)/strengthening 54 km Andhra Pradesh, 164 km Orissa, 182 km Uttar Pradesh, and 150 km West Bengal.

ⁱ (i) NH 370 km West Bengal (NH34) – canceled; loan reduced to \$79.2 million in November 2005; SHs, upgrading of 150 km to Bangladesh border; rural roads, rehabilitation of about 100 km.

^j Rehabilitation of about 1,750 km of state roads in Madhya Pradesh.

^k Construction and upgrading of 5,500 km of rural roads in each of Madhya Pradesh and Chhattisgarh.

^l Rehabilitation of about 1,700 km of state roads in Chhattisgarh.

Source: Asian Development Bank management information system.

Table A1.2: Advisory Technical Assistance

TA Reference Number/Title	Amount (\$)	Approved	Current Status	TCR	TPAR
1. Roads: National Highways					
1059 Expressway System Planning	260,000	03-Jan-89	Closed	—	—
1402 Pavement Management for National Highways	760,000	30-Oct-90	Closed	—	—
1403 Private Sector Participation in Expressway Financing, Construction, and Operation	500,000	30-Oct-90	Closed	—	—
2001 Road Safety	210,000	29-Nov-93	Closed	—	—
2002 Environmental Management of Road Projects	240,000	29-Nov-93	Closed	—	—
2003 Technical Standards of Highway Concrete Structures	350,000	29-Nov-93	Closed	—	—
3361 Capacity Building for Contract Supervision and Management in National Highways Authority of India	600,000	22-Dec-99	Closed	2003	—
3724 Enhancing the Corporate Finance Capability of National Highways Authority of India	700,000	20-Sep-01	Closed	—	—
4271 Development of High Density Corridors under Public-Private Partnership	700,000	18-Dec-03	Closed	—	—
2. Roads: State Highways and Rural Roads					
1058 Pavement Management	490,000	03-Jan-89	Closed	—	—
1404 Road Construction Industry	340,000	30-Oct-90	Closed	2000	—
4013 Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector	1,500,000	05-Dec-02	Active	—	—
4013 Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector (Supplementary)	600,000	29-Apr-05	Active	—	—
4697 Development of Road Agencies in the North Eastern States	900,000	23-Nov-05	Active	—	—
3. Railways					
1620 Enhancement of Operational Efficiency on Indian Railways	1,050,000	05-Dec-91	Closed	—	—
1621 Rationalization of Non-Bulk General Cargo Traffic	560,000	05-Dec-91	Closed	—	—
1622 Improvement of Traffic Costing and Financial Management Reporting of Indian Railways	325,000	05-Dec-91	Closed	—	—
2721 Railway Sector Improvement	800,000	19-Dec-96	Closed	—	—
4053 Management Consulting Services to Indian Railways	500,000	19-Dec-02	Active	—	—
4. Ports, Shipping, and Waterways					
1004 Ports and Shipping Sector Study	500,000	08-Jul-88	Closed	—	—
1283 Operational and Financial Assistance for Bombay Ports	600,000	29-Mar-90	—	—	—
1284 Development of Ship Repair Facilities	400,000	29-Mar-90	Closed	—	—
1770 Planning and Management Advisory Services for Paradip Port Trust	600,000	27-Oct-92	Closed	2003	—
1771 Study on Development and Implementation of MoST's Strategies for Deregulation and Policy	670,000	27-Oct-92	Closed	2003	—
2768 Ports Policy and Financing Opportunities	100,000	12-Mar-97	Closed	—	—
2880 Enhancement of India Ports Policy Implementation	1,588,000	29-Sep-97	Closed	2001	—
5. Multimodal Transport and Sector Development					
3445 Establishing a Public-Private Joint Venture for the West Bengal North-South Economic Corridor Development	150,000	25-May-00	Closed	—	—
Total	15,993,000				

— = not available, MoST = Ministry of Surface Transport, TA = technical assistance, TCR = technical assistance completion report, TPAR = technical assistance performance audit report.

Source: Asian Development Bank management information system.

Table A1.3: Project Preparatory Technical Assistance^a

TA Reference Number/Title	Amount (\$)	Approved	Current Status	TCR	TPAR
1. Roads: National Highways					
1325	Bombay-Vadodara Expressway		15-Jun-90		
	Bombay-Vadodara Expressway (Supplementary)	250,000	19-Mar-91	Closed	—
1942	Faridabad-Noida-Ghaziabad Expressway	550,000	27-Aug-93	Closed	1998
1951	Bombay-Vadodara Expressway TA Project	90,000	10-Sep-93	Active	—
	Environmental Impact Assessment				
2986	Western Transport Corridor Facilitating Private Participation	1,000,000	9-Feb-98	Closed	—
3752	National Highway Corridor – Public Private Partnership	700,000	29-Oct-01	Closed	—
4036	National Highway Corridor (Sector) Project	500,000	16-Dec-02	Closed	—
4152	National Highways Sector II	300,000	21-Jul-03	Closed	—
4355	High Priority National Highways Project	1,000,000	8-Jul-04	Canceled	—
2. Roads: State Highways and Rural Roads					
0955	Road Improvement	75,000	24-Feb-88	Closed	—
1164	Preparation of a Second Road	100,000	9-Jun-89	Closed	—
1678	Third Road Project	250,000	26-Mar-92	Closed	—
3142	West Bengal North-South Corridor Development	1,000,000	23-Dec-98	Closed	—
3540	Economic and Poverty Analysis for the West Bengal Corridor Development Project	150,000	13-Nov-00	Closed	—
3751	Madhya Pradesh State Roads Sector Development Project	600,000	29-Oct-01	Closed	—
3858	Preliminary Engineering for the West Bengal North-South Corridor Development	150,000	13-Nov-00	Closed	—
3859	Resettlement and Environmental Assessment for the West Bengal Corridor Development Project	150,000	13-Nov-00	Closed	—
3845	Madhya Pradesh State Road Engineering Design		14-Mar-02	Active	—
3914	Economic Studies for Rural Roads Sector Development	1,000,000	3-Sep-02	Closed	—
3915	Engineering Studies for Rural Roads Sector Development	150,000	3-Sep-02	Closed	—
3916	Environmental Analysis for Rural Roads Sector Development	100,000	3-Sep-02	Closed	—
3917	Institutional and Policy Development Studies for Rural Roads Sector Development	150,000	3-Sep-02	Closed	—
3918	Social Analysis for Rural Roads Sector Development	150,000	3-Sep-02	Closed	—
3995	Chhattisgarh State Road Development Project	800,000	21-Nov-02	Active	—
4220	Rural Roads Sector II	1,000,000	20-Nov-03	Active	—
4378	Northeastern State Roads	800,000	23-Aug-04	Active	—
4607	Uttaranchal State Roads	208,000	01-Jul-05	Active	—
3. Railways					
	None				
4. Ports, Shipping, and Waterways					
1853	Third Ports	600,000	11-Mar-93	Closed	—
2519	Development Strategies for Madras and Ennore Ports (formerly Madras and Ennore Ports)	600,000	28-Dec-95	Closed	2000
3974	Inland Waterway Sector Development Strategy	900,000	5-Nov-02	Active	—
	Total	13,323,000			

— = not available, TA = technical assistance, TCR = technical assistance completion report, TPAR = technical assistance performance audit report.

^a This evaluation does not evaluate these project preparatory technical assistance (PPTA) projects. These PPTA projects are evaluated by a separate Operations Evaluation Department evaluation (ADB, 2007. *Special Evaluation Study on the Performance of Technical Assistance*. Manila).

Source: Asian Development Bank management information system.

Table A1.4: Loans and Investments, 2006–2007

Project Reference Number/Title		Amount (\$ million)	Approved	Current Status	PCR	PPAR
2248	Rural Roads Sector II Investment Program	180.00	2006	Active	—	—
2308	Uttaranchal State Roads	550.00	2007	Active	—	—
2330	Madhya Pradesh State Roads II	320.00	2007	Active	—	—
Total		1050.00				

— = not available, PCR = project completion report, PPAR = project performance audit report.
Source: Asian Development Bank management information system.

Table A1.5: Advisory Technical Assistance, 2006–2007

TA Reference Number/Title		Amount (\$)	Approved	Current Status	TCR	TPAR
Multimodal Transport and Sector Development						
4836	Urban Transport Strategy	1,000,000	12-Sep-06	Active	—	—
Total		1,000,000				

— = not available, TA = technical assistance, TCR = technical assistance completion report, TPAR = technical assistance performance audit report.

Source: Asian Development Bank management information system.

Table A1.6: Project Preparatory Technical Assistance, 2006–2007

TA Reference Number/Title		Amount (\$)	Approved	Current Status	TCR	TPAR
3995	Chhattisgarh State Road Development Project (Supplementary)	1,600,000	1-Feb-06	Active	—	—
4814	TA Cluster for Project Processing and Capacity Development-Project Preparation Support for the Madhya Pradesh State Roads Project II	250,000	08 Nov 06	Active	—	—
4814	TA Cluster for Project Processing and Capacity Development-Design and Project Management Support for the Proposed North Eastern State Roads Investment Program	2,500,000	13-Dec-06	Active	—	—
Total		4,350,000				

— = not available, TA = technical assistance, TCR = technical assistance completion report, TPAR = technical assistance performance audit report.

Source: Asian Development Bank management information system.

PORTS AND INLAND WATERWAYS

A. Background

1. This appendix gives a brief overview of the Asian Development Bank's (ADB's) assistance to the port and inland waterway subsectors. ADB has gradually reduced its assistance to the port subsector in the last decade. The inland waterways transport (IWT) subsector, on the other hand, was seen as a potential area for new funding assistance. This appendix also summarizes the assessment of performance in these two subsectors and suggests directions for improving the effectiveness of ADB's assistance.

2. There are 12 major ports and 187 minor and intermediate ports along the 7,517 kilometer (km) coastline of the country. The Department of Shipping in the central government oversees the shipping and port subsector, which comprises shipbuilding and ship repair, major ports, national waterways, and IWT. Studies made by the evaluation team found the port sector to be on a fast (10% plus) growth track, fueled by robust growth in gross domestic product and export/import trade. While private investments can flow into port operations (berths, cranes, yards, storage, etc.), there is a need to invest in common user facilities like capital dredging (for draft enhancement); hinterland connectivity (rail and road); port vicinity development (roads); and capacity development in licensing arrangements, appropriate oversight, marketing, and even business development with a global focus.

3. The Inland Waterways Authority of India was created in October 1986 to develop and regulate inland waterways for shipping and navigation. The authority primarily undertakes projects for the development and maintenance of IWT infrastructure on national waterways, with the help of grants from the Ministry of Shipping, Road Transport, and Highways. Transport movements between India and Bangladesh give the IWT subsector a potential subregional dimension. But with the poor progress of ADB technical assistance (TA), this potential still has to be tapped. Commercially viable IWT on the two national waterways, North-West 1 and North-West 2,¹ linking the northeastern states of India with Bangladesh needs to be revitalized. At the same time, measures are needed to reactivate the subsector, particularly to improve river navigability, develop the vessel fleet and terminals, establish institutional arrangements (for public-private partnership [PPP]), and extend the protocol agreement between India and Bangladesh.

B. Asian Development Bank Assistance

1. Ports

4. Table A2.1 lists ADB-supported loans for Indian ports. ADB approved five loans from 1987 to 1997. All the projects were aimed at physical improvements in India's major maritime ports to enable them to handle specific commodities (i.e., fertilizer, coal, liquid cargo) and containers, and to improve operating efficiency and enhance capacity.² Figure A2.1 shows the locations of ADB projects.

¹ North-West 1: 1,000 km of the Ganga-Hoogly IWT between Haldia and Patna; NW-2: 768 km of the Brahmaputra IWT, between the Bangladesh border and Dibrugarh.

² Loans 842-IND, 1016-IND, 1181-IND, and 1556/1557-IND.

Table A2.1: Port Projects in India

Project Reference Number/Title		Amount (\$ million)	Approved	Current Status	PCR	PPAR
0842	Ports Development	87.60	1987	Closed	1993	1996
1016	Second Ports	129.00	1990	Closed	1997	2002
1181	Coal Ports	285.00	1992	Closed	2003	—
1556	Mumbai and Chennai Ports	97.80	1997	Closed	—	—
1557	Mumbai and Chennai Ports	15.20	1997	Closed	—	—
Total		614.60				

— = not available, PCR = project completion report, PPAR = project performance audit report.

Source: Asian Development Bank management information system.

5. Although all ADB ports projects experienced delays in implementation, the project completion reports and project performance evaluation reports rated them “partly” or “generally successful” in improving and modernizing port facilities. The economic internal rates of return (EIRRs) were in most cases less at completion than at appraisal, as a result of the delays and other issues during implementation. The supporting advisory technical assistance (ADTA) projects for the projects were all considered mostly relevant, consistent with individual project objectives, and also effective in developing systems and procedures to facilitate improved operations. As a result of one TA³ completed in 2002, the Government of India embarked on its present continuing initiative directed at port privatization and corporatization. That TA had a major, strategic impact.

6. With the completion of the Mumbai and Chennai ports (Loans 1556 and 1557) in 2003, ADB effectively withdrew from the port subsector as the enabling environment for private sector involvement in Indian ports became effective. However, the project performance audit report (2001) for the Second Ports Project noted that port construction costs in India are high by international standards while tariffs are low, thereby causing problems of financial sustainability of new ports. The project performance audit report identified the high costs of dredging, breakwaters, and other basic infrastructure as the main deterrents, and noted that most of the world’s top ports use public rather than private funds for dredging. The project performance audit report concluded in 2001 that “ADB’s continued investments in ports infrastructure, in addition to continued involvement in sector reforms, are warranted, and would help attract private investment.”

7. Discussions with officials of the Ministry of Shipping, Road Transport, and Highways, Planning Commission, and a port authority indicated that current issues in the port subsector include connectivity constraints. Although private sector participation has enhanced port traffic handling capacity, railway and road connectivities from the port to the nearest mainline junction are poor. With the Indian Railways and roads agencies mostly developing country networks, these port connectivities are proving to be a major bottleneck.

8. The Planning Commission’s approach paper for the 11th Five-Year Plan (FYP) recognized the improvements made during the 10th FYP but observed that major expansion and modernization will be required to support the growth in the gross domestic product and trade envisaged for India. As a result, during the 11th FYP period, ports and related infrastructure will be developed to international standards in turnaround time and clearing of import and export cargoes. The paper noted that current trends suggest that by 2015–2016, cargo traffic through Indian ports will amount to about 2,000 million tons, compared with 569 million tons handled in 2005–2006—a 250% increase—and that substantial increases in capacity at both major and minor ports will, therefore, be required. The approach paper indicated that the requisite capacity increases would need to be undertaken through PPP and by captive users, although an evident requirement to expand common user facilities would be financed by the Government and other port stakeholders, including port trusts and major users.

³ ADB. 1992. *Policy Reforms in Indian Ports and Shipping Sector*. Manila (TA 1771-IND, for \$670,000, approved on 27 October).

Figure A2.1: ADB Port Projects



2. Inland Waterways

9. ADB exited from this subsector in 2006. The only intervention had been in the form of a project preparatory technical assistance (PPTA)⁴ that had been initiated as the mode of entry. Besides an ability to promote pro-poor growth, the IWT subsector has the potential to be both socially and environmentally friendly, particularly benefiting the northeast states, while also enhancing opportunities for regional integration with Bangladesh. ADB's attempted entry into this new subsector was rather tentative and lacked a realistic approach. The TA scope was unrealistic in the sense that it combined a sector study with a PPTA, resulting in a halfhearted attempt to understand the IWT subsector. Since this was a new subsector for ADB, the approach could have been better determined with the development of a definitive sector development strategy before a PPTA was initiated. This lack of long-term perspective was compounded by the inexperience of ADB staff in the IWT subsector. ADB and the Government differed on the source of funding for this project, with the Government requesting an Asian Development Fund loan and ADB offering a loan from ordinary capital resources. All of these issues prompted an exit from the subsector.

10. The evaluation team's discussions with officials of the Inland Waterways Authority of India; Ministry of Shipping, Road Transport, and Highways; and Planning Commission indicated deficiencies in the basic infrastructure and navigation of the IWT subsector and limited opportunities for private sector involvement (other than as service providers). This suggests a need for public funding to catalyze the subsector as an alternative or possible feeder service to roads and rail, and to facilitate port connectivity. Although investment, policy change, and institutional development are needed, there has been little progress in addressing the strategic issues. Given the extent of the above issues, there appears to be no logic for ADB to continue being involved in this subsector. Unless ADB resolves its staffing issues and develops an agreement with the Government on the nature of funding, continued presence in this subsector is not likely to yield any development impacts.

11. Although inland waterways are, conceptually, a relatively eco-friendly, cost-effective, and fuel-efficient mode of transport, the IWT carries only 0.15% of total inland cargo. IWT has competed successfully to become a major transport mode in India. There are three national waterways (e.g., Ganga, Brahmaputra, and West Coast Canal) with a total length of 2,700 km. The Government has initiated several measures to integrate waterways, e.g., the Kakinada-Pondicherry canal system to be connected to the Godavari and Krishna rivers (1,095 km) in Andhra Pradesh and Tamil Nadu; the East Coast Canal from Paradip to Haldia (623 km) to be connected to the Brahmani river and the Mahanadi river delta in Orissa and West of Bengal; and the Barak river from Karimganj to Lakhimpur (140 km) in Assam. The Government intends to rehabilitate and build terminals to handle containers. There remains a potential for further IWT development, since this could reduce the traffic congestion from the road and rail subsectors and improve regional trade links with Bangladesh.

C. Implementation Efficiency

12. ADB's assistance to the port subsector is summarized in Table A2.2. In the IWT subsector, ADB's assistance progressed no further than the Inland Waterway Sector Development Strategy (PPTA 3974), which was approved in 2002.

⁴ ADB. 2002. *Inland Waterway Sector Development Strategy*. Manila (TA 3974-IND, for \$900,000, approved on 5 November).

Table A2.2: Completed Projects in the Port Subsector

Loan Number	Project	Amount (\$ million)	Effective Date	Closing Date	Implementation Issues
842	Ports Development	87.6	15-Apr-88	31-Dec-92	The PCR (1993) noted that this was the first ADB-assisted port project in India. Although there were delays in implementation and one component was deleted, the project met its main objective of improving and modernizing port facilities. The project improved container handling and contributed to more efficient container traffic operations at the ports of Kolkata, Madras, and Cochin. The PPAR (1996) rated the project partly successful overall.
1016	Second Ports	129.0	5-Apr-91	6-Oct-97	The PCR (1997) reported very long delays in implementation but rated the project generally successful. The PPAR (2001) rated the project successful and relevant in conforming to the Government's goals and policy, and to ADB's country operational strategy at the time of appraisal. Two ADTA projects were included (TA 1283, 1284), one successful, the other less so.
1181	Coal Ports	233.5	7-Jul-93	18-Apr-02	The PCR (2003) rated the project partly successful. Although the links of the least-cost transport chain envisaged to be achieved through ADB financing were successfully implemented after a substantial delay, the project was only partly successful in meeting the development objectives. Two ADTA projects were included (TA 1770, 1771), both generally successful.
1556	Mumbai and Chennai Ports	97.8	97		No PCR was available.

ADB = Asian Development Bank, ADTA = advisory technical assistance, PCR = project completion report, PPAR = project performance audit report, TA = technical assistance.

Source: Asian Development Bank management information system.

13. **Loan 842.** The project was delayed by 4 years because of procurement delays and slow government approvals. Start-up delays reflected a lack of familiarity with ADB's procedures and poor project management. A project performance audit report⁵ reestimated the EIRRs at completion and found them to be lower than the appraisal estimates (Table A2.3). The same was true for the financial internal rates of return.

⁵ ADB. 1996. *Project Performance Audit Report for Ports Development Project*. Manila.

Table A2.3: Economic and Financial Analysis of Loan 842

Subproject	EIRR (%)			FIRR (%)		
	At Appraisal	At Completion	At Post-evaluation	At Appraisal	At Completion	At Post-evaluation
Cochin	15.4	18.8	5.0	7.3	7.3	3.0
Madras (now called Chennai)	25.2	48.0	24.8	8.9	11.3	11.0
Calcutta (now called Kolkata)	17.1	12.5	6.2	7.7	10.1	6.5
Overall Project	21.7	33.3	Not available	8.4	10.0	Not available

EIRR = economic internal rate of return, FIRR = financial internal rate of return.

Source: Asian Development Bank management information system.

14. For two of the three subprojects, the EIRRs were lower than 12% because of overly optimistic estimates of traffic growth and lower efficiency gains in cargo handling. Although reductions in transport costs could be anticipated, the delayed implementation reduced the efficiency of the project.

15. **Loan 1016.** Implementation was delayed by 2 years and 9 months because of project start-up problems. The EIRRs for the subprojects at completion were significantly below those estimated at appraisal for the same reasons as for Loan 842. The financial internal rates of return were also lower at completion than at appraisal because of lower-than-expected revenues from project facilities (Table A2.4).

Table A2.4: Economic and Financial Analysis of Loan 842

Subproject	EIRR (%)			FIRR (%)		
	At Appraisal	At Completion	At Post-evaluation	At Appraisal	At Completion	At Post-evaluation
Mumbai outer lock gate	47.0	15.9	110.9	7.4	6.7	62.7
Mumbai Pir Pau pier	27.1	15.7	18.3	15.2	7.6	9.5
Mumbai ship repair facilities	22.6	14.0	11.2	7.2	4.2	4.4
Kakinada deepwater port	25.8	15.3	9.7	10.0	20.0	0.8
Overall project	Not available	Not available	45.4	Not available	Not available	13.7

EIRR = economic internal rate of return, FIRR = financial internal rate of return.

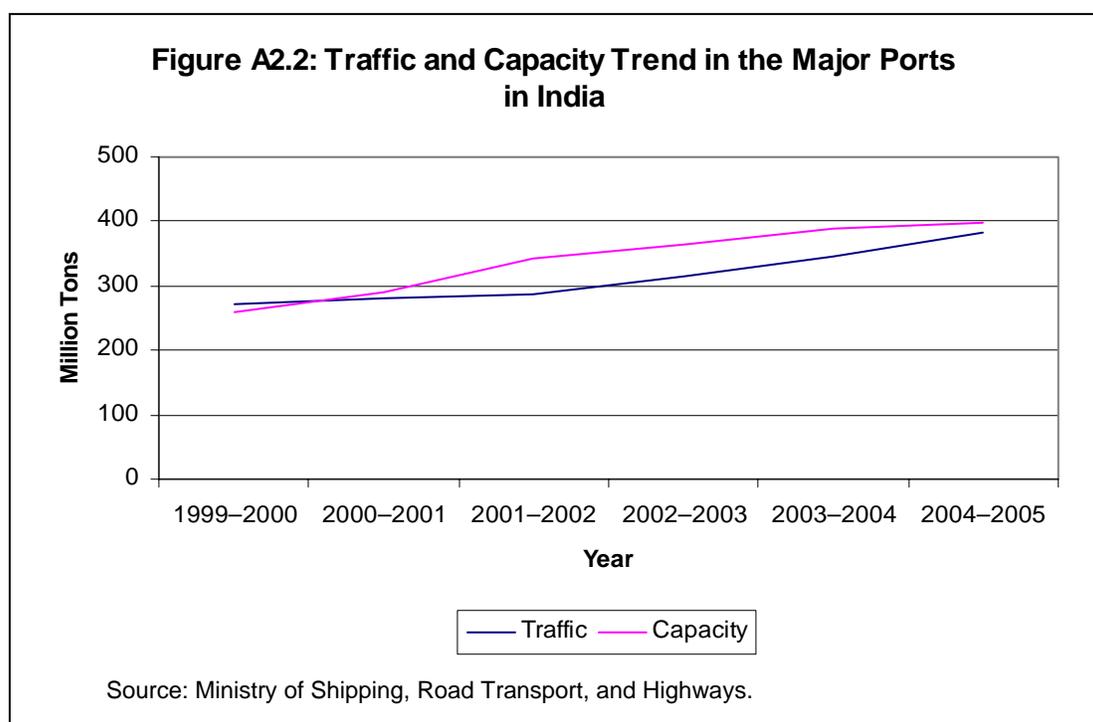
Source: Asian Development Bank management information system.

16. **Loan 1181.** This project was delayed by 3 years and 10 months because of a combination of slow government approvals and construction delays. Delays in setting up the project implementation unit continued. The EIRR for the project at completion (17.5%) was below that estimated at appraisal (22.3%) because of the recurrent issue of ambitious traffic estimates and delays in realization of peak cargo traffic. No postevaluation was conducted for this project.

D. Likely Effectiveness

17. ADB's assistance to the port subsector ceased in the late 1990s, by which time the private sector was actively engaged in several of India's major ports. ADB's policy dialogue had made a positive contribution to this development. The growth in traffic in ADB-assisted ports is

an indicator of the general effectiveness of the assistance. This is demonstrated in Figure A2.2, which shows a gradual increase in traffic handled at the major ports.⁶ The fact that the capacity has also increased indicates the presence of other interventions, including those by the private sector, to enhance capacity.



18. All ADB loans in the port subsector were prepaid with the use of lower-cost refinancing. Overall, ADB's assistance in the ports subsector was well received and helped to develop the subsector to its present levels. In the case of Loan 1556/1557 to the Mumbai and Chennai ports, more than 55% of the loan amount was canceled. This reduced the overall effectiveness of the loans. Although private sector participation has been growing in this subsector, there remain areas of common infrastructure that require public funding or multilateral assistance.

E. Technical Assistance

19. Table A2.5 provides a summary of ADTA projects in the port subsector.

Table A2.5: Technical Assistance to the Port Subsector

TA No.	Title	Start Year
1004	Ports and Shipping Sector Study	1988
1283	Operational and Financial Assistance for Bombay Ports	1990
1284	Development of Ship Repair Facilities	1990
1770	Planning and Management Advisory Services for Paradip Port Trust	1992
1771	Study on Development and Implementation of MoST's Strategies for Deregulation and Policy	1992
2768	Ports Policy and Financing Opportunities	1997
2880	Enhancement of India Ports Policy Implementation	1997

MoST = Ministry of Surface Transport, TA = technical assistance.
Source: Asian Development Bank management information system.

⁶ ADB's assistance has covered the major ports of Kolkata, Chennai, Cochin, Mumbai, Paradip, and Ennore and one minor port of Kakinada. The major ports covered by ADB assistance form the bulk of the traffic growth in India and the chart presents a realistic assessment of the effectiveness of ADB's assistance.

20. TA 1004⁷ covered a study of the role and potential of the port and shipping subsector in the national economy, including a review of the existing situation, capacity, and constraints relative to expected traffic up to 2000. Investments for the 8th FYP were to be identified and evaluated, and priorities established. The institutional framework was to be reviewed, and improvements recommended as required. No technical assistance completion report was prepared.

21. As part of the Second Ports Project,⁸ TA 1283⁹ provided assistance to Bombay Ports for its operating and financial management systems. The TA aimed to formulate an action plan to develop a vessel traffic management system and a computer-based management information system to enable the Mumbai Port Trust to effectively monitor the financial and operational performance of its assets. The project performance audit report for Loan 1016 reported that the TA developed a computerized management information system, which achieved its purpose of improving the Mumbai Port Trust's operating and financial efficiency.

22. TA 1284¹⁰ involved the preparation of an investment program for the 8th FYP (FY1993–FY1997). This included a study of the organization, institutional framework, and management and operations of India's ship repair subsector, with a view to achieving more effective and efficient use of available resources and encouraging greater participation by the private sector. The project performance audit report for Loan 1016 reported in 2002 that the TA was not successful, as the implementation of its recommendations proved to be slow and inconsequential. The country's ship repair subsector remains uncompetitive.

23. As part of the Coal Ports Project,¹¹ TA 1770¹² provided assistance to (i) improve the engineering and financial capabilities of Paradip Port Trust and its ability to prepare corporate plans; (ii) assist the management of Paradip Port Trust in improving its bulk material handling operations; (iii) train operating personnel to carry out adequate preventive maintenance on new coal handling equipment; and (iv) achieve improved, efficient, and effective port performance. The project completion report for Loan 1181 reported in 2003 that the TA activities were relevant and consistent with the project's objectives. The Paradip Port Trust implemented the TA recommendations in the areas of computerization in finance, material management, payroll, estate management, monitoring operations and controls of the mechanized coal-handling plant facilities, pollution control and dust suppression arrangements in various sections of mechanized coal-handling plant facilities, and privatization of its operations. A new tariff structure for handling coal through a mechanized coal-handling plant was fixed. Also, the Paradip Port Trust became oriented toward private participation in future port development activities, including the second mechanized iron ore handling plant and oil jetty, through the build-operate-transfer route. However, the Paradip Port Trust's ability to produce medium- to long-term corporate plans remained marginal.

⁷ ADB. 1988. *Technical Assistance to India for the Ports and Shipping Sector Study*. Manila (TA 1004-IND, for \$500,000, approved on 8 July).

⁸ ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to India for the Second Ports Project*. Manila (Loan 1016-IND, for \$129 million, approved on 29 March).

⁹ ADB. 1990. *Technical Assistance to India for Operational and Financial Assistance for Bombay Ports*. Manila (TA 1283-IND, for \$600,000, approved on 29 March).

¹⁰ ADB. 1990. *Technical Assistance to India for the Development of Ship Repair Facilities*. Manila (TA 1284-IND, for \$400,000, approved on 29 March).

¹¹ ADB. 1992. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for Coal Ports*. Manila (Loan 1181-IND, for \$285 million, approved on 27 October).

¹² ADB. 1992. *Technical Assistance to India for Planning and Management Advisory Services for Paradip Port Trust*. Manila (TA 1770-IND, for \$600,000, approved on 27 October).

24. TA 1771¹³ provided assistance in (i) formulating a broad-based strategy for privatization in the port and shipping subsector; and (ii) developing measures for achieving the goals of improved capacity, operating efficiency, and productivity to meet user requirements in the 21st century and reduce public funding. The project completion report for Loan 1181 reported in 2003 that the Government followed the TA recommendations by embarking on an initiative directed at port privatization and corporatization. Key areas were identified by the Government for private sector participation in the development and operation of major ports, and guidelines for inviting private sector participation were issued to various ports. The TA was rated generally successful in fulfilling the tasks set out, and its recommendations were broadly implemented by the Government. A new piece of legislation, to succeed the Major Ports Trust Act, 1963, enabling the privatization initiative was passed by the Government.

25. TA 2768¹⁴ was aimed at finalizing project preparatory work for the planned Third Ports Project. The TA included an analysis of policy issues in the port subsector in the following three areas: (i) improving the implementation framework for the privatization of the port subsector and training port trust and Ministry of Surface Transport staff in applying the framework; (ii) introducing the concept of a commercialization in the port subsector; and (iii) examining financing opportunities in the port subsector, in both the public and private sectors, in the medium term (up to 2010). The analysis thus undertaken was intended to provide background information for the policy agenda to be taken up under the Third Ports Project. No TA completion report was prepared.

26. TA 2880¹⁵ had three main aspects:

- (i) **Commercialization and privatization.** This involved (a) assisting the Government in strengthening the commercial orientation and performance capacity of port trusts by formulating a specific program of changes; (b) assisting the Government and the port trusts in strengthening capacity to promote private sector participation by formulating specific measures (policy, legal, training, financial) that would accelerate privatization; and (c) preparing a model for privatization generally applicable to major ports.
- (ii) **Corporatization.** This involved (a) preparing a detailed corporatization program for the Jawaharlal Nehru Port Trust; (b) preparing a detailed corporatization program for the new port of Ennore, which was being developed under the sponsorship of Chennai Port; and (c) preparing a general model for corporatization based on the Jawaharlal Nehru Port Trust and Ennore programs.
- (iii) **Assistance to the tariff authority for major ports.** The assistance to the newly established authority covered the formulation of its policies, procedures, criteria, and organizational structure.

27. The TA completion report in 2001 rated TA 2880 generally successful, with an adequate design and successful implementation within the budget and without any major problems. The TA responded to the issues related to the corporatization and commercialization of the ports and terminals, and provided assistance in inviting tenders and evaluating the bids. The successful implementation was attributed to the consultants' good performance, the satisfactory cooperation of the officials and staff from the major ports, and ADB's professional approach in supervising and monitoring the work.

¹³ ADB. 1992. *Study on Development and Implementation of MoST's Strategies for Deregulation and Policy*. Manila (TA 1771-IND, for \$670,000, approved on 27 October).

¹⁴ ADB. 1997. *Ports Policy and Financing Opportunities*. Manila (TA 2768-IND, for \$100,000, approved on 12 March).

¹⁵ ADB. 1997. *Enhancement of India Ports Policy Implementation*. Manila (TA 2880-IND, for \$1.59 million, approved on 29 September).

F. Overall Conclusion

28. In the port subsector, the completed projects conformed to the Government's goals and policy, as well as ADB's country operational strategy at the time of appraisal. However, with the change in ADB's strategy toward commercialization and private sector participation, the relevance is now somewhat less. In other words, considering the relatively high level of interest from the private sector, there is less justification for ADB to remain involved in the port subsector. However, the past assistance in this subsector has conformed to ADB's sector strategies as well as the country's needs at that time.

29. With the high rate of growth in the Indian economy, the major ports are under increasing pressure to handle India's growing trade traffic. The private sector has responded well to the need to fund and operate the port facilities. However, the expansion of the port facilities would be more effective if the bottlenecks in port connectivity were resolved. Connectivity to the ports via rail and road now faces funding problems. This connectivity includes the transport infrastructure between the ports and the nearest mainline road and rail head. Since this technically falls within the road and railway subsectors, ADB could explore future funding opportunities along these lines.

30. In the case of IWT, ADB could provide assistance that serves the general goals of pro-poor economic growth and regional economic cooperation. The current PPTA in IWT lacks coherence and faces problems of design and progress. Moreover, unless the more strategic issues relating to the nature of funding for this subsector and adequate resources within ADB are sorted out, there is little logic for ADB to continue its operations in the subsector. If future presence in this subsector is desired, ADB will need to address the strategic as well as project-level issues before reentering the subsector.

G. Recommendations

Port and Inland Waterway Subsectors	Responsibility	Timing
<p>1. Provide Focused Support to Improve Port Connectivity. The port subsector in India has benefited in the past from ADB's interventions, TA, and loans, which resulted in the provision of the necessary enabling environment to establish port trusts and PSP. Appendix 12 summarizes the performance of ADB in the port and inland waterway subsectors. The major ports are under increasing pressure to handle India's growing trade traffic. There has been good response from the private sector in funding and operating the port facilities. However, the connectivity to the ports via rail and road has faced funding problems. In other words, opportunities for funding the development of transport infrastructure between the ports and the nearest mainline road and railhead could be explored by ADB.</p>	SARD	Following the completion of the India CAPE and decisions made during the preparation of the India country partnership strategy.
<p>2. Reassess ADB Presence in IWT Subsector. The recent exit from the IWT subsector was prompted by the lack of progress as well as the ineffective method of entry into the subsector. The PPTA used for entry lacked coherence, and there was little progress toward project development. Considering the benefits of subregional connectivity and pro-poor economic growth, this subsector has high potential for development effectiveness. However, unless the more strategic issues relating to the nature of funding for this subsector and adequate resources within ADB are sorted out, there is little logic for ADB to continue its operations in the subsector. If future presence in this subsector is desired, ADB will need to address the strategic as well as project-level issues before reentering the subsector.</p>	SARD	Following the completion of the India CAPE and decisions made during the preparation of the India country partnership strategy.

ADB = Asian Development Bank, CAPE = country assistance program evaluation, IWT = inland waterways transport, PPTA = project preparatory technical assistance, PSP = private sector participation, SARD = South Asia Department, TA = technical assistance.

Source: Operations Evaluation Mission.

EVALUATION FRAMEWORK AND METHODOLOGY

1. Evaluating the impact of the Asian Development Bank's (ADB's) assistance without examining the performance of the transport sector as a whole is conceptually impossible, as ADB's assistance was not undertaken in isolation. Rather, ADB's assistance was accompanied by investments by other multilateral and bilateral financing institutions, such as the Japan Bank for International Cooperation (JBIC) and the World Bank, and by the Government. ADB provided more technical assistance (TA) projects than other development agencies and financial institutions. These TA projects addressed a range of systemic issues, such as institutional development; capacity building (contract administration, environment and social development, corporate finance); private sector participation; toll strategies; commercialization of operation and maintenance; and road safety. These factors required a systematic evaluation of the transport sector and developments in the sector over the past 20 years. The impact of individual projects has been assessed with the use of available information and site visits, and the results form the basis for evaluating the patterns and common traits of ADB transport sector projects in India. Comparing individual projects systematically can yield important insights into the main issues and problems facing the transport sector today. In contrast to a project-level evaluation, a sector evaluation can help to assess the aggregate potential impact of the projects and TA on the achievement of sector, rather than project, objectives.

2. The sector assistance program evaluation (the evaluation) sought to answer the following broad questions:

(i) Bottom-Up Evaluation

- (a) **Relevance.** Were the strategies pursued by ADB relevant to:
 - i. the evolving economic circumstances in India?
 - ii. ADB's country strategies and programs?
 - iii. essential sector policy and institutional reforms?
 - iv. the transport needs perceived by the central and state governments, as well as development plans?
 - v. the strategies of other development partners?
- (b) **Likely effectiveness.** Are ADB's project designs likely to achieve the intended outcomes in light of the perceived effectiveness of the projects?
- (c) **Implementation efficiency.** Were or are ADB's operations in the transport sector efficient?
 - i. Does ADB work effectively with the Government in implementing the projects?
 - ii. Do ADB's operations ensure efficient procurement?
- (d) **Likely sustainability.** Are the planned outputs likely to be sustained?
- (e) **Likely impact.** What is the likely impact of road interventions at the local and regional levels?

(ii) Top-Down Evaluation

- (a) **ADB's performance.** Were ADB's choices of thematic initiatives in the transport sector appropriate?
- (b) **Sector performance.** What are the trends in the transport sector?

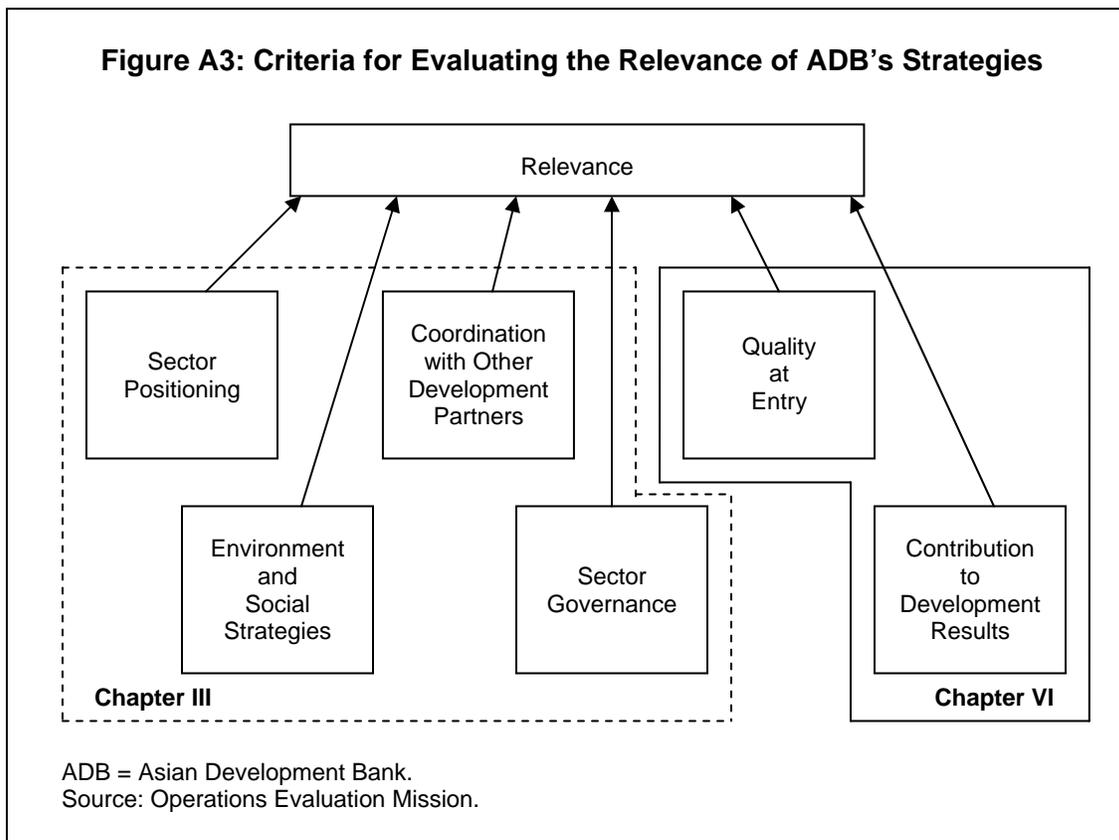
3. Since there are not enough completed projects and corresponding outputs, the evaluation assesses the likely impact of the sector results and their outcomes with the use of secondary data and a socioeconomic impact assessment of a sample of road projects. Table A3.1 provides an outline of the evaluation approach adopted by the evaluation.

Table A3.1: Evaluation Approach

Evaluation Parameters	Nature of Analysis	Sources of Information
A. Bottom-Up Evaluation		
Relevance	<ul style="list-style-type: none"> • Analysis of ADB's sector strategy in the context of the country's needs 	<ul style="list-style-type: none"> • Desk study • Meetings with government officials and ADB staff • Policy experts' inputs
Efficiency (mainly implementation efficiency)	<ul style="list-style-type: none"> • Analysis of ongoing projects to assess progress made • Assessment of completed projects (limited to a sample owing to the disparate locations of the subprojects and lack of information available) 	<p>Completed projects</p> <ul style="list-style-type: none"> • Desk review of PCRs and internal reports • Meetings with government officials <p>Ongoing projects</p> <ul style="list-style-type: none"> • Physical inspections of selected ongoing projects • Technical study to identify implementation bottlenecks • Meetings with government officials, consultants, and contractors • Discussions with government officials and desk study to assess progress of reforms • Review of internal documents
Likely effectiveness	<ul style="list-style-type: none"> • Partly subjective analysis using without-project scenarios and comparable projects 	<ul style="list-style-type: none"> • Desk study of PCRs and PPARs • Interviews with stakeholders • Field study – socioeconomic study of selected road projects
Likely sustainability	<ul style="list-style-type: none"> • Analysis of the national highways program using a financial model • For other subsectors, partly subjective analysis based on available information 	<ul style="list-style-type: none"> • Financial model of the national highways program • Assessment of current fund allocations for state roads and rural roads • Physical inspections of completed projects • Discussions with government officials to assess sustainability of reforms and investments
Likely impacts	<ul style="list-style-type: none"> • Partly subjective analysis based on a socioeconomic assessment of a sample of projects 	<ul style="list-style-type: none"> • Interviews with stakeholders • Field study – socioeconomic impact of selected road projects • Secondary data
B. Top-Down Evaluation		
Sector positioning and quality of entry	<ul style="list-style-type: none"> • Review of ADB's selection of interventions within the overall development plans of the country and analysis of the objectives of the assistance 	<ul style="list-style-type: none"> • Desk study • Meetings with government officials and ADB staff • Policy experts' inputs
Contribution to development results	<ul style="list-style-type: none"> • Partly subjective analysis of the socioeconomic impacts and the likely contribution of the projects to development results 	<ul style="list-style-type: none"> • Interviews with stakeholders • Field study – socioeconomic impact of selected road projects • Secondary data
ADB's performance	<ul style="list-style-type: none"> • Review of ADB's implementation performance 	<ul style="list-style-type: none"> • Review of internal reports • Discussions with government officials and ADB staff

ADB = Asian Development Bank, PCR = project completion report, PPAR = project performance audit report.
Source: Operations Evaluation Mission.

4. The evaluation framework (Figure A3) consisted of five building blocks of evaluation, i.e., relevance, efficiency, likely efficacy, likely sustainability, and other institutional and development impacts. For each of these criteria, questions to be addressed through the evaluation were raised. For example, a key question regarding relevance was: whether the policy objectives outlined in the country strategies and programs were appropriate for the development context and strategies of India in the past 17 years. Another question related to relevance was whether the planned transport sector interventions in the ADB country strategy reflected the policy objectives. The coordination with other development partners that have been active in this sector, particularly the World Bank and JBIC, was also assessed. Specific themes that cut across different evaluation parameters were identified; these included road safety, private sector participation, and contribution to poverty reduction.



5. The evaluation relied heavily on discussions with development partners; with ADB and government officials at the central and state levels; and with a few key stakeholders (nongovernment organizations, infrastructure financing banks, contractors, and transport operators).

6. The methodology is based on a thematic approach focused on the roads and rail subsectors. This approach includes the following studies:

- (i) policy level assessment,
- (ii) technical study,
- (iii) financial study, and
- (iv) socioeconomic assessment.

7. A policy-level assessment of all the subsectors (roads and highways, rail, and, to a limited extent, inland waterways and ports) was conducted, and the relevance of ADB's strategies was reviewed against evolving trends in the sector and the Government's policies on transport growth and management, as reflected in the country's five-year plans.

8. The assessment included a brief evaluation of the waterway and port subsectors. The following areas were assessed:

- (i) ADB's initial strategy in each of these subsectors and the underlying rationale for the strategy; and
- (ii) changes in the subsectors, and development needs where evident.

9. The evaluation included a technical study to assess the effectiveness with which projects in the transport sector, primarily in roads and highways and in rail, were being implemented. For roads and highways, the study identified the bottlenecks in the way of ongoing projects and their causes. It also assessed compliance with approved road standards (including adequacy of intersections; safety measures [e.g., crash barriers, warning signs, and special provisions for roadworks], public transport stops, parking for heavy goods vehicles, and traffic control devices);¹ provisions for pedestrians (including safe-crossing facilities); nonmotorized transport; and the effectiveness of access control measures on national highways. The environmental reports guiding ADB's projects were also assessed in the technical study.

10. The National Highways Authority of India (NHAI) has embarked on a major expansion exercise in the national highway subsector. To assess the financial sustainability of the National Highway Development Program (NHDP), the evaluation included a financial study to assess the pipeline of capital investment and operation and maintenance requirements. This pipeline was compared with the available funding in the form of fuel cess and other government allocations as well as private funds (taking into account the prospects for further private sector growth and expansion). Experiences with private sector participation were analyzed.

11. A socioeconomic assessment in selected rural areas of India was part of the evaluation. It was done to evaluate socioeconomic changes such as livelihood patterns; industrial development; road safety; environmental issues; HIV/AIDS cases; access to market areas, community centers, and education and health facilities; and effects on farmgate prices. The assessment was limited to changes in the road subsector (national roads, state roads, and rural roads); the rail subsector was excluded. Completed and ongoing road projects funded by ADB and the Government were assessed. The intent was to assess the wider changes in the road subsector rather than ADB projects only, on the assumption that non-ADB projects would be similar to ADB projects and would generate similar socioeconomic changes.

12. The socioeconomic assessment was based on focus group discussions and key informant interviews. However, no traffic count studies were conducted. The assessment used Madhya Pradesh as a sample area for "with project" and "without project" comparisons of rural roads and state roads. The relative effects of improved connectivity and access for the local communities were reviewed. The rationale for selecting the various subsectors for this assessment is summarized below:

- (i) National highways contribute significantly to the national economy, and indirectly affects the local economy through industrialization, greater economic mobility, and wider opportunities.

¹ Including traffic signals, signs, and road markings.

- (ii) State highways affect the regional economies and act as critical links between the rural economies and the state and national economies.
- (iii) Rural roads have significant localized impacts by providing access to the remote rural communities and farmers and bringing them into the economic mainstream in the country.

13. Table A3.2 gives details of the roads assessed. The study used the Surat-Manor Tollway Project (Loan 1747) in Gujarat as sample national highway. For state roads and rural roads, Madhya Pradesh was used as the sample area. The rationale for using Madhya Pradesh is as follows:

- (i) Madhya Pradesh has witnessed a major rural roads program as well as a major state roads program, both financed by ADB.
- (ii) The state has districts (Betul and Chindwara) that have witnessed a high level of road improvement activities as part of rural road and state road programs.
- (iii) These districts also have areas with almost no interventions; these could provide a control area.

Table A3.2: Road Sections Covered by the Study

Type of Road	State	District	Source of Funding	Name of Road Section Covered
National highway (NH)	Gujarat and Maharashtra	<ul style="list-style-type: none"> • Surat • Navsari • Valsad (in Gujarat) • Thane (in Maharashtra) 	ADB	<ul style="list-style-type: none"> • NH8: Surat Manor Tollway Project
State highway (SH)	Madhya Pradesh (MP)	<ul style="list-style-type: none"> • Betul • Chindwara • Khandwa • Harda 	ADB MP State Roads Project and Government	<ul style="list-style-type: none"> • SH: Multai-Chindwara (ADB) • SH: Khandwa-Harda • SH: Khandwa-Icchawar
Rural road	MP	<ul style="list-style-type: none"> • Betul • Seoni • Dewas • Harda 	ADB RRS-I Project and Government PMGSY	26 villages under the PMGSY program and 24 villages without any road connectivity

ADB = Asian Development Bank, PMGSY = Pradhan Mantri Gram Sadak Yojana, RRS = rural road sector.
Source: Operations Evaluation Mission.

14. The rationale for using the Surat-Manor toll road in Gujarat is as follows:
- (i) The toll road was recently completed with ADB financing.
 - (ii) The toll road has been developed as a commercially viable national highway in line with several other programs of NHAI.
 - (iii) The toll road can be identified as a distinct project connecting centers of economic activity.
15. The Operations Evaluation Mission gathered information through the following:
- (i) Interviews and in-depth discussions with key stakeholders in the sector, including:
 - (a) officials at the Ministry of Shipping, Road Transport, and Highways;
 - (b) officials of the Department of Economic Affairs and Planning Commission;
 - (c) officials of NHAI;

- (d) officials of the Ministry of Rural Development in Delhi and their representatives in the rural road development authorities in the states of Madhya Pradesh and Chhattisgarh;
 - (e) officials of the state highway authorities in the states of Madhya Pradesh and Chhattisgarh that had received ADB loans, including the Madhya Pradesh Road Development Corporation and the public works departments in both states;
 - (f) officials of the Maharashtra State Road Development Corporation, whose road development program has had negligible foreign external assistance;
 - (g) officials of the Ministry of Railways, Indian Railways and its state-owned special-purpose vehicle for the ADB rail project (Rail Vikas Nigam Limited, as well as consultants appointed by ADB to monitor the rail reform program and consultants hired for the accounting reforms for the Indian Railways);
 - (h) officials of the Department of Shipping (within Ministry of Shipping, Road Transport, and Highways) and the Indian Ports Association;
 - (i) officials of the Inland Waterways Authority of India;
 - (j) officials of financial institutions interested in investing in private sector participation and build-operate-transfer projects at both the national and state levels;
 - (k) build-operate-transfer operators involved in the design, construction, and maintenance of national highways, state highways, and bridges;
 - (l) development partners, including the World Bank, Department for International Development of the United Kingdom, and JBIC;
 - (m) ADB transport specialists at ADB headquarters in Manila and at the India Resident Mission in New Delhi; and
 - (n) consultants and contractors involved with national, state, and rural road projects.
- (ii) Focus group discussions with representatives of transport user groups, including rural communities affected by connectivity and accessibility afforded by roads (see [v] below).
 - (iii) Inspection of selected assets, such as national highways and state highways built under the NHDP with ADB financial support, build-operate-transfer highways and bridges, and rural roads.
 - (iv) Review of documentation, including the five-year plans of the Government of India with policies and programs for the transport sector and other sectors; ADB reports such as country strategies and programs, appraisal reports, reports and recommendations of the President, project completion reports, TA completion reports, project performance evaluation reports, back-to-office reports, and annual reports; minutes of transport portfolio review meetings; consultants' reports; and reports and studies prepared by other development agencies active in the sector.
 - (v) Technical study of ADB-funded transport projects to assess their adherence to standards, workplans and schedules, quality requirements, potential impacts, and expected outcomes; financial study to assess the sustainability of the NHDP and state road development programs; and socioeconomic study of selected rural communities (with and without road or highway access) in states and districts, to evaluate how the availability of roads affects people's quality of life and livelihood, and to identify the key factors that constrain households without an all-weather road connection.

16. The evaluation of ADB's assistance program met with several methodological challenges. First, the evaluation hoped to differentiate the performance of ADB-financed projects from that of transport sector projects in general. Although such a distinction is not always possible, this evaluation tries to highlight the differences found. Efforts were also made to distinguish between the impact of external factors, e.g., the Asian financial crisis, and that of policy and management errors. Second, the task of assessing ADB's assistance over the last 3 decades was complicated by the variation in the performance of ADB-supported projects over time. Third, the evaluation goes beyond project-level evaluations like those in project performance evaluation reports (which assess the performance of individual projects) by assessing the potential cumulative impact of the projects on the achievement of important sector goals, e.g., reliable and affordable transport services, a financially viable transport sector, better safety, and, directly and indirectly, poverty reduction.

17. Although the few project completion reports and project performance audit reports on transport projects in India (Appendix 2) provided useful information for the evaluation on project implementation and initial operation, their usefulness for the evaluation was limited for two reasons. First, the assessment of the economic returns of the projects by project completion reports and project performance audit reports disclosed the overly optimistic appraisal forecasts. But since the evaluation did not conduct any traffic studies, these economic analyses could not be updated to reflect the intervening changes.² Second, projects may perform well individually and attain high success rates, yet cumulatively fail to achieve the main sector goals, either because the sector goals are too ambitious or the individual projects have limited relevance to their achievement. The evaluation, therefore, tried to draw information from a variety of other sources besides project completion reports and project performance audit reports. It also relied on site visits and more updated information on the performance of the sector and ADB-supported projects to reach a balanced assessment.

18. Table A3.3 gives the broad evaluation framework that guided the evaluation.

² Even if the evaluation had included traffic studies of the completed projects, the economic benefits would have been hard to trace to specific transport projects because there have been other interventions in the projects themselves or in the project area.

Table A3.3: Evaluation Framework

Evaluation Criteria	Areas of Evaluation	Major Indicators and Areas of Consideration	Sources of Information	Data Collection/Analysis Methods
A. Relevance of ADB assistance to transport sector development in India and the development goals of the country	1. Were ADB's strategies relevant to evolving circumstances in India? 2. Did the transport sector strategy in the CSPs change with these circumstances? 3. Did ADB's interventions support essential sector policy and institutional reforms?	<ul style="list-style-type: none"> • Economic reform milestones • Macroeconomic assessment of policies and financial management in the sector • Changes in ADB's strategy • Critical development trends and key indicators to the transport sector 	<ul style="list-style-type: none"> • Economic sector reports • Country economic reports • CSP • Government reports • Thematic reports • Key stakeholders 	<p>Applicable to all areas for evaluation under "Relevance"</p> <ul style="list-style-type: none"> • Desk review of relevant documents • Interviews with ADB staff • Key informant interviews with government officials and key stakeholders • Focus group discussions <p>Key stakeholders included people affected by the selected projects (Madhya Pradesh), researchers, consultants, NGOs, infrastructure financing banks, contractors, transport operators, and rail freight users</p>
	4. Did ADB's strategies respond to the transport needs perceived by the central and state governments, and by other development partners?	<ul style="list-style-type: none"> • Transport sector priorities (Government's and ADB's) • ADB's institutional development initiatives • Consistency with stakeholders' objectives • Appropriateness of TA projects 	<ul style="list-style-type: none"> • As mentioned above 	
	5. Were ADB's activities and strategies harmonized with those of other development partners?	<ul style="list-style-type: none"> • Coordination with activities and strategies of other development partners • Appropriate project/program designs 	<ul style="list-style-type: none"> • ADB reports including RRP, CSPs, CSPUs • Development partners and government 	<ul style="list-style-type: none"> • Discussions with development partners and government staff
B. Likely efficacy	Are ADB's project designs likely to achieve the intended outcomes, in light of the perceived effectiveness of the	<ul style="list-style-type: none"> • Fulfillment of stated objectives for completed projects and subprojects • Feasibility of achieving objectives in view of 	<ul style="list-style-type: none"> • ADB status reports, BTORs, and other such reports • Key stakeholders 	<ul style="list-style-type: none"> • Desk review of relevant documents • Rapid technical assessment of selected project sites (in Madhya Pradesh) • OEM and field observations

Evaluation Criteria	Areas of Evaluation	Major Indicators and Areas of Consideration	Sources of Information	Data Collection/Analysis Methods
	projects/programs?	current progress		<ul style="list-style-type: none"> • Key informant interviews with government staff, observers, development partners, and other stakeholders
C. Process efficiency	Did/Do ADB's operations in the transport sector (i) provide effective support to the Government in implementing the projects? (ii) ensure efficient procurement?	<ul style="list-style-type: none"> • Economic analyses of completed projects • Timeliness and adequacy of counterpart funding • Cost-effectiveness in generating outputs • Procurement and implementation issues 	<ul style="list-style-type: none"> • PCRs and PPARs • Government agencies 	<ul style="list-style-type: none"> • Desk review of relevant documents • OEM and field observations
D. Sustainability	Are the planned outputs likely to be sustained?	<ul style="list-style-type: none"> • Institutional capacity to make available adequate funding and other resources • Financial viability of operating entities • Government ownership and commitment to programs and projects • Pricing (for rail subsector) 	<ul style="list-style-type: none"> • Data from NHAI, ADB, and development partners • Progress reports • IR reports 	<ul style="list-style-type: none"> • Financial study to assess the pipeline of capital investment and O&M requirements for national highways • Discussions with IR
E. Lessons for future ADB assistance to the transport sector in India		<ul style="list-style-type: none"> • Recurring issues in transport projects • Trends in subsectors • Comparisons with other similar countries 	<ul style="list-style-type: none"> • ADB status reports, BTORs, and other such reports • Key stakeholders 	<ul style="list-style-type: none"> • Desk review of relevant documents • Rapid technical assessment of selected project sites (in Madhya Pradesh and Chhattisgarh) • OEM and field observations • Key informant interviews with government staff, observers, development partners, and other stakeholders

ADB = Asian Development Bank, BTOR = back-to-office report, CSP = country strategy and program, CSPU = country strategy and program update, IR = Indian Railways, NGO = nongovernment organization, NHAI = National Highways Authority of India, O&M = operation and maintenance, OEM = Operations Evaluation Mission, PCR = project completion report, PPAR = project performance audit report, RRP = report and recommendation of the President, TA = technical assistance.

Source: Operations Evaluation Mission.

PROFILE OF THE INDIAN TRANSPORT SECTOR

A. Growth in Transport Sector

1. The evident economic growth in India over the last 2 decades has increased demand for all transport services, particularly land transport via road and rail, as shown in Table A4.1. Vehicle ownership has increased, with the number of private motor cars growing by 16%, two wheelers by 20%, and goods vehicles by 13% per year from 1991 to 2003.

2. In the 1990s, as India's economy expanded by 6–7% a year (Table A4.1), transport demand grew by about 10% yearly.¹ The rate of growth, however, varied by subsector, reflecting structural changes in demand for different modes, as well as the effect of some supply-side factors.

Table A4.1: Key Economic Indicators for India, 1987–2004

Year	Population (millions)	Population Density (persons per km ²)	GDP (\$ billion, in 1993/1994 prices)	GDP Growth (% annual change)
1987	784	238	137	3.8
1990	835	254	170	5.6
1995	923	281	219	7.3
2000	1,015	309	290	4.4
2001	1,033	314	304	5.8
2002	1,051	320	317	4.0
2003	1,068	325	344	8.5
2004	1,086	330	368	6.9

GDP = gross domestic product, km² = square kilometer.

Source: World Bank. 2004. *Key Indicators of Developing Asian and Pacific Countries*.

3. Table A4.2 shows the contribution of the transport sector to gross domestic product (GDP) and the proportion of public expenditures on this sector. The contribution of the transport sector to the economy is higher than the proportion of expenditures used to improve and maintain the sector.²

Table A4.2: Share of Transport Sector in the National Economy

Year	Share of Transport in Overall GDP (%)	Share of Transport in Total Expenditure (%)
1999–2000	5.7	3.2
2000–2001	5.8	4.5
2001–2002	5.8	4.8
2002–2003	6.0	4.1
2003–2004	6.2	3.9
2004–2005	6.4	4.2

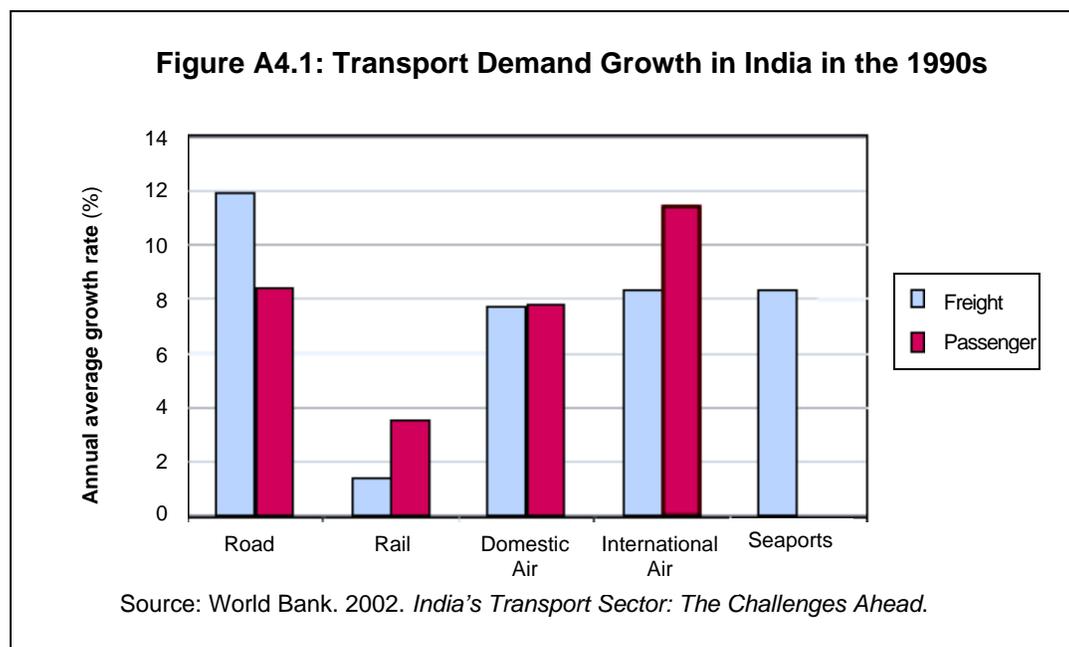
GDP = gross domestic product.

Source: Central Statistics Office. Government of India. 2006. National Account Statistics; and CMIE. 2004. Public Finance. Economic Intelligence Service.

¹ World Bank. 2002. *India's Transport Sector: The Challenges Ahead*. Washington, DC.

² A World Bank report in 2004 stated that in FY2002, the road sector accounted for slightly less than 3% of government expenditure and contributed about 15.5% of revenues. Thus, the road sector generated a large fiscal surplus (Source: World Bank. 2004. *Highway Sector Financing in India: A Policy Note*. Washington, DC).

4. The road subsector, which already had an estimated 80% share of land transport demand in 1990, witnessed annual growth of about 12% in freight demand and 8% in passenger demand (footnote 2) (Figure A4.1). Both air and ocean transport also showed healthy growth, whereas the demand for rail transport grew more slowly, at just 1.4% a year for freight and 3.6% a year for passenger traffic. This growth could be attributed to both demand-side and supply-side factors. On the supply side, intense competition from the mostly privately run road transport services, coupled with operating inflexibilities and capacity constraints on key Indian Railways routes, increased the modal share of roads.



5. The above demand is fueled by sustained economic growth and rising incomes over the last 2 decades, resulting in rapidly growing vehicle ownership (Table A4.3). The increasing vehicle ownership is a key factor underlying the rapid traffic growth. But it has also created congestion on the roads, contributing to longer journey times, higher vehicle operating costs, higher vehicle emissions, and more traffic accidents. Table A4.4 provides an overview.

Table A4.3: Registered Motor Vehicles in India, 1981–2003 (thousands)

Year (as of 31 March)	Total Vehicles	Two Wheelers	Cars, Jeeps, and Taxis	Buses	Goods Vehicles	Others ^a
1981	5,391	2,618	1,160	162	554	897
1991	21,374	14,200	2,954	331	1,356	2,533
2000	48,857	34,118	6,143	562	2,715	5,319
2001	54,991	38,556	7,058	634	2,948	5,795
2002	58,924	41,581	7,613	635	2,974	6,121
2003	67,033	47,525	8,619	727	3,488	6,674
AAGR 1981–1991 (%)	15	18	10	7	9	11
AAGR 1991–2003 (%)	10	11	9	7	8	8
AAGR 1981–2003 (%)	12	14	10	7	9	10

AAGR = average annual growth rate for the period.

^a Tractors, trailers, three-wheelers (passenger vehicles), and other miscellaneous vehicles not classified separately.

Source: Ministry of Shipping, Road Transport, and Highways.

Table A4.4: Profile of the Indian Transport Sector

Mode	Parameter	Unit	1950–1951	1960–1961	1970–1971	1980–1981	1990–1991	1991–1992	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000
Roads	Total network:	'000 km	400	525	915	1,485	2,350	2,486	3,320	2,466	2,540	2,616	2,695
	NHs	'000 km	22	24	24	32	33.7	33.7	34.5	34.6	38.52	49.58	52.01
	% of villages with 1,000+ persons connected by all-weather roads	percent				29	45.8	46.6	85.7				
	Surfaced length	'000 km	156	234	398	684	1,113	1,160	1,517	1,394	1,422	1,450	1,479
Railways	Route length	km	53,596	56,247	59,790	61,240	62,367	62,458	62,915	62,725	62,495	62,809	62,759
	Electrified route length	km	388	748	3,706	5,345	9,968	10,653	12,306	13,018	13,490	13,765	14,261
	Freight traffic	t	93	156.2	196.5	220	341.4	360	405.5	409.02	429.4	420.9	456.4
	Net ton-km	b.t. km	44.12	87.68	127.36	158.47	242.7	256.9	273.52	279.99	286.77	284.27	308.04
	Passengers	million	1284	1,594	2,431	3,613	3,858	4049	4,018	4,153	4,348	4,411	4,585
	Passenger-km	million	66,517	77,665	118,120	208,558	296,544	314,564	341,999	357,013	379,897	403,884	430,666
Major ports	No. of major ports	number	5	9	10	10	11	11	11	11	11	11	11 ^a
	Traffic handled	t	19.38	33.12	55.58	80.27	151.67	156.64	215.34	227.26	251.66	251.72	271.87
Minor ports	Traffic handled	t			6.69	6.73	11.27	13.33	24.36	24.93	38.61	36.31	62.52
Inland waterways	Length of navigable waterways	km	14,544	14,544	14,544	14,544	14,544	14,544	14,544	14,544	14,646	14,646	14,646
Civil aviation	No. of airports	number				84	117	117	120	120	120	122	122
Indian airlines	Available ton-km	million		113	208	663	927	1,090	1,046	1,075	1,094	1,123	1,121
	Revenue ton-km	million		83	161	420	699	761	723	698	701	709	740
Air India	Available ton-km	million			515	1,623	2,260	1,973	2,610	2,452	2,294	2,394	2,238
	Revenue ton-km	million			275	980	1,381	1,149	1,619	1,485	1,454	1,474	1,457

b = billion, km = kilometer, NH = national highway, t = metric ton.

^a A new major port, Ennore, was commissioned in 2001 bringing the total number of major ports to 12 currently.

Source: Planning Commission. *India 10th Five-Year Plan (2002–2007)*. New Delhi.

B. Institutional Arrangements

6. Responsibilities for the transport system in India are divided between the central and state governments. In broad terms, the central Government is responsible for railways, national highways, major ports and international shipping, civil aviation, and national inland waterways. The responsibility for each mode resides with a mode-specific ministry in the central Government.³ Figure A4.2 shows the overall institutional arrangements in the central Government.

7. **Roads.** The National Highways Authority of India (NHAI) was created under an act of Parliament in 1988 to be responsible for developing, maintaining, and managing the national highway system. Because of lack of funds and a clear organizational strategy, however, NHAI was not formally established until February 1995. In 1998, NHAI initiated the National Highway Development Program (NHDP) for the upgrading and widening of the national highways network. It now implements about \$1 billion worth of projects yearly. The Asian Development Bank (ADB) and the World Bank were catalysts in NHAI's establishment. Aside from providing loans to set up NHAI, ADB worked closely with the authority over the years in providing technical assistance projects for institutional development; capacity building (contract administration, environment and social development, corporate finance); private sector promotion; toll strategy setting; commercialization of operations and maintenance; and road safety. NHAI is now implementing 24,000 kilometers (km) out of the total national highways length of 66,590 km. The development of NHAI has been a major institutional success that has had a positive impact on the development of the road sector.

8. States manage their road development activities through their public works departments (in the case of Maharashtra and Madhya Pradesh, for example) or roads and buildings departments (in Gujarat and other states). With the support of ADB,⁴ Madhya Pradesh has established the Madhya Pradesh Road Development Corporation to (i) act as the state highway authority; (ii) develop strategic plans for the state road subsector; (iii) identify and prioritize projects according to economic, social, technical, and commercial criteria; and (iv) serve as the nodal agency of the state government in implementing road and related projects under public-private partnership (PPP) and build-operate-transfer (BOT) schemes. The 8,000 km network of state highways in Madhya Pradesh was transferred to the Madhya Pradesh Road Development Corporation for development, construction, improvement, and maintenance. It is the executing agency for the upgrading of 1,750 km of state highways with ADB funding support.⁵ A similar road development structure is expected to be used in the neighboring Chhattisgarh state.

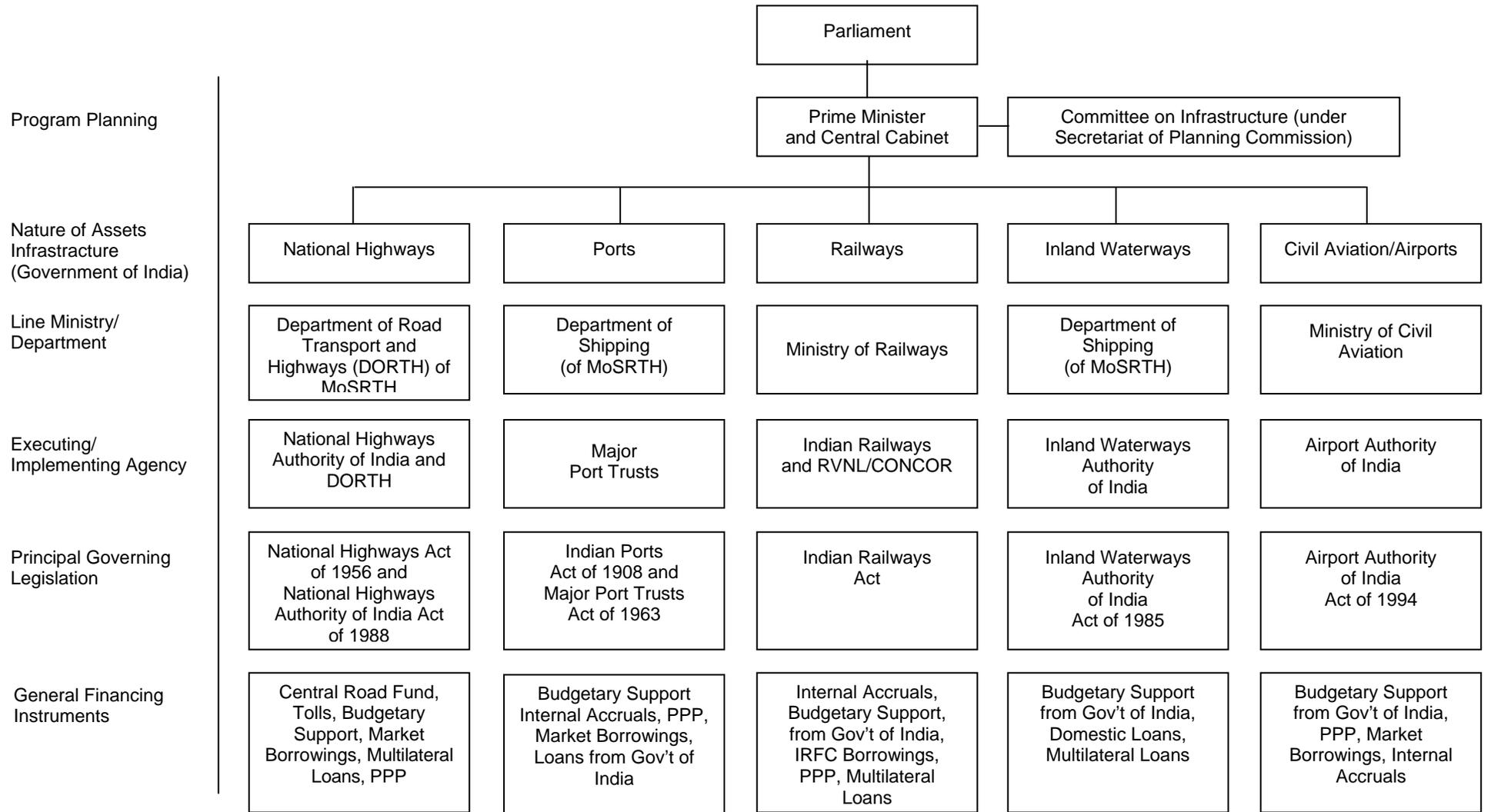
9. Village roads providing local connectivity are managed and maintained by local bodies (*panchayat*). The centrally-sponsored rural roads program (e.g., *Pradhan Mantri Gram Sadak Yojana* [PMGSY]) is managed by the state rural roads development agency under the guidance of the central National Rural Roads Development Agency. Funding for the PMGSY comes from the central Government. Roads managed by the public works departments are developed, maintained, and managed with funds from the state's budget. Some degree of central support to the states for developing and maintaining their roads comes from the Central Road Fund and the 12th Finance Commission allocation. However, adequate funding for road maintenance remains a problem.

³ There are five central mode specific ministries—the Ministry of Shipping, Road Transport, and Highways; the Ministry of Civil Aviation; the Ministry of Railways; the Ministry of Rural Development; and the Ministry of Urban Development.

⁴ ADB. 2002. *Technical Assistance to India for Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector*. Manila (TA 4013-IND, for \$1.5 million, approved on 5 December).

⁵ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and Technical Assistance Grant to India for the Madhya Pradesh State Roads Sector Development Program*. Manila (Loan 1959-IND [Project Loan], for \$150 million, approved on 5 December).

Figure A4.2: Institutional Arrangement in the Central Government for Transportation Infrastructure Delivery



CONCOR = Container Corporation of India; IRFC = Indian Railway Finance Corporation; MoSRTTH = Ministry of Shipping, Road Transport, and Highways; PPP = public-private partnership; RVNL = Rail Vikas Nigam Limited.
 Source: Operations Evaluation Mission.

10. The Government of India established the Central Road Fund under the Central Road Fund Act in 2000 as a mechanism for using cess (tax) proceeds exclusively for road development in the country. An explicit cess⁶ (or tax) on fuel (petrol and high-speed diesel) provides the funds for the Central Road Fund. It collects around \$1.23 billion yearly. The cess first flows into the Consolidated Fund of India and is then transferred into the Central Road Fund with the approval of the Parliament. The Central Road Fund is controlled by the Ministry of Finance. Its funds are allocated for national, state, and rural roads as defined in the act. For the national highways, Central Road Fund allocations are earmarked for exclusive use in the implementation of the NHDP. With this assured revenue stream, the NHAI has been able to raise debt funds to finance its program. Corresponding allocations for state highways and rural roads are significant additional resources for these subsectors. The fund differs from the road funds in other countries in that it is meant for both development and maintenance activities. The mechanism of allocations to the various subsectors should be made more transparent.

11. **Railways.** The Indian Railways is state-owned and operated by the Ministry of Railways. The Indian Railways' finances are separated from the general budget of the Government, and its annual requirement for funds is voted through a separate budget presented to the Parliament. The Ministry of Railways is headed by the minister of railways. The Indian Railways policy is formulated and managed by the Indian Railways board, comprising a chairman and six functional members. Wide powers are vested in the board to supervise the running of 16 zonal railways, a metro railway (Kolkata), production units, construction organizations, and other rail establishments. Ten subsidiary organizations⁷ under the Ministry of Railways have specialized responsibilities for Indian Railways' operations, finance, engineering, and other activities.

12. The Indian Railways incorporated Rail Vikas Nigam Limited as a special purpose vehicle to implement some physical improvements in the Indian Railways' National Railway Development Program (National Rail Vikas Yojana) program, which was supported by ADB.⁸ Rail Vikas Nigam Limited's responsibilities include project development and resource mobilization for commercially run projects, using largely nonbudgetary funds. To mobilize alternative sources of funding, the Rail Vikas Nigam Limited implements BOT projects with funding from various development partners, and raises funds in the capital and debt markets.

C. Current Developments in the Subsectors

1. Roads

13. The road network currently cannot handle high traffic density and has poor surface quality. Nearly 38% of the national highways network is single-lane, while about 59% is double-lane. State highways and major district roads account for about 13% of the road network and 40% of traffic. While inadequate supply of funds is acknowledged as the main issue, the Government has been making efforts to improve the overall network through public as well as private sector funding.

14. In the road subsector, there is inconsistency in the distribution of public spending between segments. Revenue in the subsector comes from various sources: vehicles taxes (on the initial purchase) and annual fees; fuel taxes imposed by both the central Government and

⁶ The cess was initially set at Rs1 per liter, for both gasoline and diesel, and then increased to Rs1.50 per liter (\$0.03 per liter) in 2003. In 2004, \$438 million from the Central Road Fund went to the construction and maintenance of national highways, \$222 million to state highways, and \$511 million to rural roads (Source: Ministry of Finance). Some states have introduced additional fuel cess. Uttar Pradesh, for example, has imposed an additional sales tax of 4% on diesel, and 6% on gasoline, raising about \$55 million per year for the road sector.

⁷ Indian Railway Construction, Rail India Technical and Economic Services, Centre for Railway Information Systems, Container Corporation of India, Indian Railways Finance Corporation, Konkan Railway Corporation, Indian Railway Catering and Tourism Corporation, Rail Tel Corporation of India Limited, Mumbai Railway Vikas Corporation, and Rail Vikas Nigam Limited. A new organization is being planned for the dedicated freight corridor.

⁸ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Railway Sector Improvement Project*. Manila (Loan 1981-IND, for \$313.6 million, approved on 19 December).

the state governments; road tolls; and direct taxes on road freight and passengers. The revenue from these different sources is collected in a central pool,⁹ from which expenditures are funded. In 2002, the revenue from road user charges was \$3.3–\$4.4 billion. Road subsector revenues and expenditure among the different segments that year were as follows:¹⁰

- (i) **Highways.** Road user charges (\$2.2 billion) exceeded expenditures (\$1.4 billion). There could be a broad balance if the highways were adequately maintained.
- (ii) **District and rural roads.** Road user charges (\$748 million) were below expenditure (\$1.4 billion).
- (iii) **Urban roads.** Road user charges were substantially greater than urban road expenditure.

a. National Highways

15. NHA has initiated a massive NHDP as summarized below:
- (i) **NHDP I.** Four-laning of the Golden Quadrilateral. This first phase of the NHDP will link the four metropolitan cities—Chennai, Delhi, Kolkata, and Mumbai.
 - (ii) **NHDP II.** Four-laning of the North-South and East-West corridors. The North-South corridor connects Srinagar to Kanyakumari including the Kochi-Salem spur, and the East-West corridor connects Silchar to Porbandar. This second phase of the NHDP will also cover port connectivity and other national highway projects.
 - (iii) **NHDP III.** Four-laning of high-density national highways totaling 10,000 km. This phase is to be implemented through the BOT mode. The stretches of national highways covered carry high volume of traffic, connect state capitals with the network established in the first two phases, and provide connectivity to places of economic, commercial, and tourist importance;
 - (iv) **NHDP IV.** Two-laning of 20,000 km of national highways to provide balanced and equitable distribution of the improved highway network throughout the country. Capacity, speed, and safety on the new two-lane highways will match the minimum benchmarks for the entire national highways network.
 - (v) **NHDP V.** Six-laning of 6,500 km of four-lane national highways comprising the Golden Quadrilateral and other high-density stretches, through PPP on a BOT basis. These corridors are now being four-laned under NHDP I, and the program for their six-laning was to begin in 2006 and to be completed by 2012. Of the 6,500 km proposed under NHDP V, about 5,700 km will be taken up in the Golden Quadrilateral and the remaining 800 km would be selected on the basis of approved eligibility criteria.
 - (vi) **NHDP VI.** Development of 1,000 km of expressways on a BOT basis to serve the growing urban centers, particularly those located within a few hundred kilometers of each other. These expressways will be built on new alignments.
 - (vii) **NHDP VII.** Other highway projects—ring roads, bypasses, grade separators, and service roads—considered necessary for the full use of highway capacity and for enhanced safety and efficiency.

16. The NHDP is by far the largest national highways rehabilitation program of the Government. It currently covers 17,161 km¹¹ and is being expanded in phases, as mentioned above. The Government originally intended to complete the Golden Quadrilateral by December 2003, but has had to postpone the deadline several times because of problem projects. Under a revised schedule, about 92% of the Golden Quadrilateral was to have been completed by December 2005, but only 10% of the North-South/East-West corridor improvements had been completed by 28 February

⁹ The Central Road Fund has been set up by the Government to streamline funding for road rehabilitation and maintenance in India.

¹⁰ Source: World Bank. 2004. *Highway Sector Financing in India: A Policy Note*. Washington, DC.

¹¹ Planning Commission. 2006. *Midterm Appraisal of 10th Five-Year Plan*. New Delhi.

2005. The completion deadline of December 2006 was also not met. Full completion is now expected by December 2007. Meeting even this deadline will be a challenge.

17. The four-laning of 10,000 km of national highways by March 2010 under NHDP III is to be achieved entirely via BOT agreements to avoid the use of budget funds. A special accelerated road development program for the Northeastern Region (NHDP-Northeast), involving 7,639 km of roads (3,251 km of national highways and 4,388 km of other roads), is included, to improve connectivity in the northeastern states. The network is expected to accelerate development in this remote, underprivileged region.

18. Road connectivity to major ports is a vital part of a trade development initiative that will decongest growing port areas to facilitate the movement of bulk cargo and containers at India's major ports. The Port Connectivity Project, under the NHDP, involves improving national highway connections to 10 major ports—Chennai, Haldia, Jawaharlal Nehru Port, Kandla, Kochi, Mangalore, Mormugao, Paradip, Tuticorin, and Visakhapatnam. The project is expected to be completed in 2007.

b. State Highways

19. State highways and major district roads vary widely in their condition and stage of development from state to state. With the central Government increasingly focused on national highways, the state highway subsector tends to depend on the state governments for funding. Accruals from the Central Road Fund are inadequate to finance the needs of the subsector. A larger portion of state funding, however, goes to rural roads because of the increasing need to address rural development issues. As a result, state governments are increasingly looking to the private sector to fund state highways.

20. Table A4.5 shows the states that involve the private sector in road projects, mainly state highways:

Table A4.5: State Road Projects

State	Road Projects with PSP	
	No. of Projects	Estimated Cost (\$ million)
Gujarat	5	25
Jharkhand	1	12
Karnataka	5	104
Maharashtra	4	1,310
Orissa	1	8
Punjab	11	157
Rajasthan	28	90
Tamil Nadu	3	42
Total	58	1,748

PSP = private sector participation.

Source: Committee on Infrastructure, www.infrastructure.gov.in

c. Rural Roads

21. India has a rural road network of more than 2.70 million km. Earth tracks that do not meet the road technical standards make up more than 1 million km of this total. Rural roads have suffered from unsystematic planning. With several agencies involved in developing and maintaining these roads, there was no uniform development of a network. Rural road development was traditionally perceived more as employment generation than as an activity that provided all-weather means of access.

22. PMGSY was launched in December 2000 as the first attempt to systematize the rural road development effort. The PMGSY is guided by the following considerations:

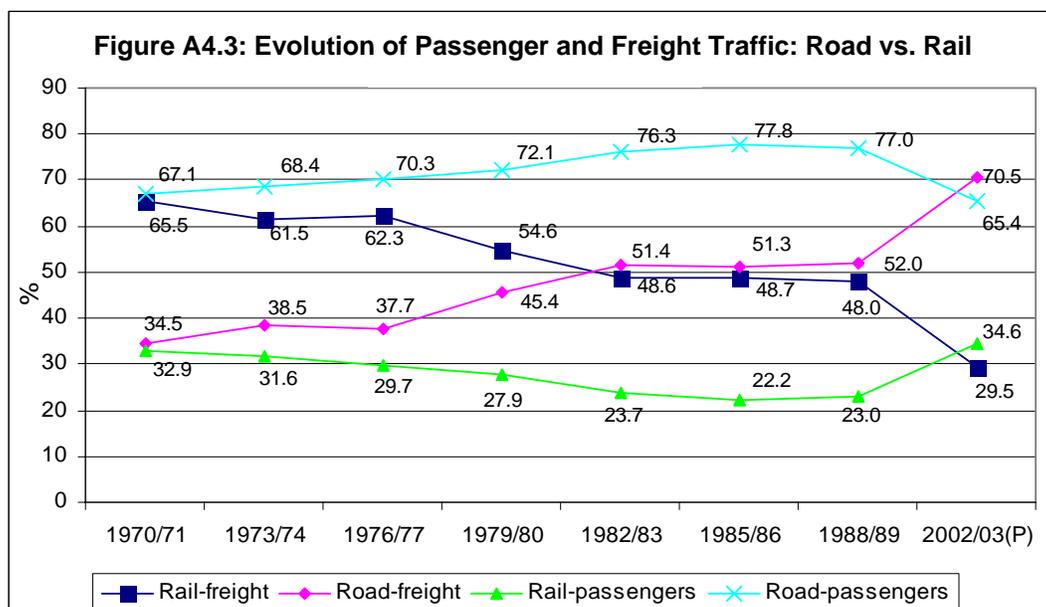
- (i) Rural roads will provide farm-to-market all-weather connectivity for all habitations with a population of at least 500 (at least 250 for hill states and desert and tribal areas).

- (ii) The program will include network augmentation as well as modernization.
- (iii) New connectivity will be provided to (a) 60,000 habitations with a population of at least 1,000, (b) 81,000 habitations with a population of at least 500, and (c) 29,000 habitations with a population of at least 250.
- (iv) The upgrading of about 370,000 km of rural roads is expected to cost about \$11.6 billion.
- (v) New connectivity is expected to cost about \$17.3 billion.
- (vi) About \$13.2 billion in total expenditure is planned until 2010; further additions will be planned after that.
- (vii) The total estimated cost of the entire project is about \$29 billion.

23. The PMGSY is a massive program, running in parallel to the NHDP. Although the overall design of the program is sound in its institutional and progress monitoring arrangements, project prioritization is muddled. This is because the first projects were identified on the basis of unreliable data on habitations. The PMGSY guidelines were also changed a number of times, causing uncertainty in implementation. As a result, several low-priority projects were implemented at the start, on the assumption that these had high priority. These initial problems appear to have been addressed, although progress has been slow.

2. Railways

24. The Indian Railways owns and operates one of the largest rail networks in the world, spreading over 63,140 route-km. Passenger traffic increased from 66 billion passenger-km in 1950–1951 to 457 billion in 2000–2001, while freight traffic during the same period increased from 44 billion net ton-km to 315 billion. However, between 1970–1971 and the late 1990s, the share of railways in the freight traffic market dropped from 65.5% to around 48.0% and its share in passenger traffic, from 32.9% to 23.0% (Figure A4.3).¹²



Sources: The Japan International Cooperation Agency (JICA) study team's estimate based on the *Teri Energy Data Directory Yearbook 2002/03* (for 1970/71 to 1988/89); JICA study team (for 1996/97); Centre for Monitoring Indian Economy. Basic Statistics for various years relating to the Indian Economy; Ministry of Railways. 1998. *Status Paper on Indian Railways*; Ministry of Finance. 1999. *Economic Survey*.

¹² Mukherjee, A., and R. Sachdeva. 2004. *Trade in Land Transport Services: Railways*. ICRIER Working Paper 119. New Delhi.

25. At present, the Indian Railway's freight and passenger revenues are increasing as traffic flows on both rail and road grow, reflecting India's economic growth. The growth in traffic could be attributed to both demand-side and supply-side factors. While there was a major increase in demand for both freight and passenger services, the Indian Railways also initiated several measures to regain its lost share of the market. The improvement in the operations of the Indian Railways are shown in Table A4.6.

Table A4.6: Recent Improvements in the Performance of Indian Railways

Indicator	2000–2001	2005–2006
Freight unit cost (paise per net ton-km)	61	52
Freight operating margin (%)	22	57
Net ton-km per wagon per day	2,042	3,000

km = kilometer.

Sources: Rail Vikas Nigam Limited and Ministry of Railways.

26. However, market-oriented reforms are still needed to ensure that the performance can be sustained and can improve further. The implementation of the reforms has been delayed. For example: (i) consultants for the cost accounting system took an exceptionally long time to be appointed; and (ii) the Indian Railways has expressed reservations about doing a study for a regulatory authority.

27. In 2002, the Government initiated the National Rail Vikas Yojana¹³ to remove capacity in critical sections of the Indian Railways network. It has three components:

- (i) Strengthening of Golden Quadrilateral rail services and diagonals;
- (ii) Strengthening of rail connectivity to ports and development of multimodal corridors to the hinterland; and
- (iii) Construction of four major bridges, namely, (a) Bogibeel, a rail and road bridge across the Brahmaputra river; (b) Munger, a rail and road bridge across the Ganga river; and (c) Patna Ganga bridge and a bridge over the Kosi river.

28. The Ministry of Railways has formulated an integrated modernization plan for 2005–2006 to 2009–2010 to upgrade the Indian Railways operations, including both passenger and freight services, to modern global standards. The total expenditure involved would be about \$5.5 billion. In keeping with the broad concept of NHA's Golden Quadrilateral and to enable the Indian Railways to compete with the road transport services using the upgraded national highways network, the Ministry of Railways has announced the launching of dedicated freight corridors. These would consist of new tracks exclusively laid for freight trains along the Golden Quadrilateral, thereby enabling freight trains to travel at speeds of more than 100 km an hour and helping to decongest rail traffic. On the present network, passenger and freight trains move on the same track, causing delays and increasing the risk of accidents.

29. The Indian Railways plans to use a number of PPP models to enhance its capacity and improve the services: (i) a special-purpose vehicle involving various stakeholders, including state governments; (ii) BOT; (iii) private freight terminals; and (iv) a wagon investment scheme. The special-purpose vehicle scheme envisages the participation of the private sector and other beneficiaries and national-level infrastructure funding institutions in the development of railway infrastructure through concessions. The concession period can be fairly long (e.g., 33 years) and can be extended further. Indian Railways will also be involved in such projects with the help of state governments. While this model shares the revenues with the Indian Railways, the BOT model transfers more risks to the concessionaire. The BOT model envisages private sector participation through a consortium of construction contractors and financiers. Under the BOT scheme, the concessionaire will design, build, and operate the facility. After the concession

¹³ National Railway Development Program.

period, the facility will be transferred back to the Indian Railways. The Indian Railways will also encourage the private sector to develop freight terminals, with Indian Railways paying service charges to compensate for the capital cost, and the private sponsor allowed to charge customers separately for services such as handling, loading and unloading, warehousing, and transport.

30. To encourage PPP in wagon procurement to meet the anticipated demand for rail freight traffic, the Indian Railways announced a new wagon investment scheme during the 2005–2006 budget presentation. This approach focuses on a guaranteed number of wagons every month to a customer based on the number of wagons procured. Also, freight concessions will be awarded to participating customers. The wagons can be procured by individuals, corporate bodies, or associations or groups of companies. The customers can procure the wagons directly from the builders approved by the Ministry of Railways, subject to the use of the current Indian Railways standard design and specifications and inspection by the agency nominated by the Indian Railways. It remains to be seen, however, whether the Indian Railways' new initiatives to attract private capital will be more successful than previous schemes.

31. In 2002, the Government set up a special railway safety fund to replace old assets including tracks, bridges, rolling stock, signaling equipment, and other safety enhancement items. However, funding was reduced from \$802 million in 2005–2006 to \$462 million in 2006–2007 despite the backlog in track renewal and bridge rehabilitation. The Indian Railways has attributed the reduction in allocation to a decrease in the volume of civil works.

D. Implementation of Railways Reforms

32. Excerpts from Rakesh Mohan Committee Report¹⁴ in 2001 suggested that the driving factor behind restructuring of the Indian Railways needs to be the adoption of a commercial orientation. One of the major challenges of commercialization of the railways is to shift the culture and mindset from a bureaucracy into a market savvy and customer-oriented, profit-driven business. With diminishing subsidies and budget allocations, this appeared to be the only route to self-sufficient viability. The report suggested that the Indian Railways needs to review its governance structure; governance which defines the roles and institutional relationships associated with policy, regulation, and management.

33. The Indian Railways did initiate several measures to adopt a commercially oriented way of conducting business. These included:

- (i) Commercial development of railways land and air space as one of the nontariff measures to generate revenues.
- (ii) Increase in permissible axle load to 22.9 tons and in some cases to 25 tons, although this is well short of the 30-ton norm in other countries.
- (iii) Introduction of roll-on roll-off services on the Konkan Railways, tied-up with the Central Warehousing Corporation to provide more value added services as well as door-to-door transportation of freight.

34. Overall, the Indian Railways did implement some of the reforms suggested by the Rakesh Mohan Committee but did not touch upon the core issues such as revamping the organizational structure, transparent tariff mechanism, and internal product-oriented reorganization. It could be argued that the Indian Railways has gained a lot in the short term but could hit a growth ceiling when the internal slack capacity is fully squeezed out. It is important for Indian Railways to progress further on implementation of reforms. It is indeed difficult for

¹⁴ The Indian Railways Report–2001: Policy Imperatives for Reinvention and Growth—Expert Group on Indian Railways chaired by Rakesh Mohan.

such a huge organization to change in the face of competition from roads and airlines. However, with adequate political will and ownership, this could be achieved.

E. Tenth Five-Year Plan: Description

35. The 10th Five-Year Plan (FYP) (2002–2007) for the transport sector has adopted these broad policy objectives in response to the growing demand in the sector:

- (i) Ensuring transport growth in such a way as to enable all regions to participate in economic development, with special attention to the integration of remote regions like the North-East into the economic mainstream;
- (ii) Augmenting capacity, improving quality and productivity through technology upgrade, and modernizing operation;
- (iii) Emphasizing higher maintenance standards to reduce the need for frequent rebuilding;
- (iv) Generating more financial resources internally and increasing private sector participation in transport service provisions;
- (v) Increasing overall economic efficiency by bringing competition into the provision and maintenance of transport infrastructure and services;
- (vi) Giving more emphasis to safety, energy efficiency, environmental conservation, and beneficial social impact; and
- (vii) Developing an optimal intermodal mix, where each mode operates efficiently and according to its comparative advantage, and complements the services provided by other modes of transport.

F. Midterm Appraisal

36. To assess the overall progress made on the various plans and programs, the Planning Commission undertook a midterm appraisal of the 10th FYP in 2006. Its overall assessment of the growth in rail and port traffic from 2002 to 2004 was that “plan targets are likely to be achieved or even exceeded,” with Indian Railways having recorded some improvement in financial performance. However, the commission also found that the Indian Railways’ prescribed targets for internal and extra-budgetary resources would be difficult to achieve. In the road subsector, the four-laning and six-laning of the Golden Quadrilateral was behind schedule, the appraisal found, but work relating to the strengthening of weak pavement and the improvement of the riding quality of roads was ahead of target. The outlook for the various subsectors as outlined in the midterm appraisal report is summarized in Box A4. The 11th FYP is expected to be in line with this outlook.

Box A4: Outlook for Indian Roads, Railways, and Ports from 2006

Roads

- The Ministry of Shipping, Road Transport, and Highways (MoSRTTH) should prepare a detailed, 2-year program to optimize the use of available budgetary support for a mix of engineering, procurement, construction, and build-operate-transfer (BOT) projects;
- MoSRTTH should prepare targets and milestones to enable the monitoring of programs, including the National Highway Development Program (NHDP);
- A model concession agreement should be developed for BOT projects;
- The institutional capacity of the National Highways Authority of India to establish a multidisciplinary, professional body with high-quality financial management and contract management expertise should be enhanced;
- A committee of secretaries must address interministerial issues, including bottlenecks in ongoing projects;
- A system should be developed for collecting and analyzing traffic information and inventorying the condition of assets;
- A model concession agreement on the operation and maintenance and tolling of completed stretches of the NHDP should be drawn up;
- A dedicated organization for road safety and traffic management should be set up;
- A law should be passed for economic regulation and the resolution of disputes in public-private partnerships (PPPs); and
- Leverage the cess amount from the Central Road Fund available for the Pradhan Mantri Gram Sadak Yojana (PMGSY) for raising resources.

Railways

- An integrated modernization plan based on transport corridors should be implemented;
- The investment strategy should be rationalized by linking future investments with improvements in capacity and in the quality of services;
- The Ministry of Railways and the Planning Commission should collaborate in preparing a paper on tariff setting, including the need for a rail tariff authority;
- Organizational reforms should be carried out to set up a fully computerized accounting system conforming with international accounting practices; make production units profit centers; grant concessions to the private sector to operate uneconomic lines; and outsource noncore activities;
- PPPs should be encouraged in the development of high-density corridors, tourist trains, additional goods trains serving major commercial and industrial centers, collieries, and power stations;
- Competition in container movement should be allowed; and
- A time-based plan should be formulated for increasing capacity on specific congested routes to meet the increasing traffic.

Ports

- The scope of private sector participation in the development of ports should be increased;
- Ports should be corporatized to encourage efficient management, institutional funding, and private investment;
- The role of Tariff Authority for Major Ports should be reviewed;
- The productivity of major ports should be improved through technology upgrades;
- Manning scales should be rationalized to improve port productivity; and
- Perspective plans for the long-term development of each major port should be prepared.

Source: Planning Commission. 2006. *Midterm Appraisal of 10th Five-Year Plan*. New Delhi.

G. South Asia Regional Economic Cooperation

37. The South Asia Subregional Economic Cooperation (SASEC) program, which was launched in 2001 with ADB assistance, provides a forum for the four countries in the region (Bangladesh, Bhutan, India, and Nepal) to discuss, identify, and prioritize subregional cooperation projects in the six priority sectors—transport; energy and power; environment; information and communications technology; tourism, trade, and investment; and private sector cooperation. Some difficulties were encountered during the initial implementation of SASEC but overall progress has improved more recently. Cooperation in transport has progressed, with a framework being developed for subregional connectivity involving 21 corridors (existing and actual), six of which have been identified as priority corridors for upgrading to improve connectivity in the subregion. ADB intends to provide loan assistance selectively for the upgrading of some segments of these corridors. Other activities include broadening the scope of work of SASEC's Transport Working Group to cover interregional transport issues, specifically the establishment of closer links between SASEC and the Greater Mekong Subregion initiative.

38. The Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation (BIMSTEC) was formed in December 1997 by Bangladesh, India, Myanmar, Sri Lanka, and Thailand and has emerged as an important cross-regional cooperative initiative joining countries in South Asia and the Greater Mekong Subregion. All SASEC members are now also members of BIMSTEC. At the first BIMSTEC Summit in July 2004, a program for economic cooperation was set out in six sectors: trade and investment, energy, tourism, transport and communications, technology, and fisheries. India is leading the initiatives in tourism, transport, and communications.

39. These subregional efforts are intended to (i) encourage strong political commitment from the participating countries; (ii) identify and implement quick-yielding projects to demonstrate tangible benefits within a short time frame; (iii) establish core working groups with the financial and technical support required to advance project cooperation to achieve the goals of regional cooperation; (iv) ensure the right balance between improving hard and soft infrastructure; (v) mobilize resources for regional cooperation, dependent on identifying sound and viable projects that offer clear and tangible benefits to the countries involved; and (vi) involve the private sector in regional cooperation activities as the promoter of trade, financier of infrastructure projects (e.g., roads), and facilitator of the regional cooperation process.

40. An international north-south transport corridor is planned between India, the Russian Federation, and Iran, using Indian ports to provide outlets to the Indian Ocean. The agreement among the three countries provides a shorter route to Moscow via Bunder Abbas, Bunder Anzali, the Caspian Sea, and Astrakhan, and beyond via Iran. Ongoing studies are exploring various bottlenecks on the route in terms of time, cost, efficiency, risks, information flow, customs requirements, other procedures, etc., and will suggest practical solutions to overcome these difficulties.

41. In the case of the Indian transport sector, there are several potential areas where the above initiatives could bear fruit. For landlocked countries like Bhutan and Nepal, transit through India and Bangladesh is essential to promote economic development. Road connectivity between India and the People's Republic of China via Nepal could significantly increase trade and investment among the three countries. For the northeastern states of India, transit through Bangladesh can significantly reduce the cost of access to the sea and to neighboring countries and beyond. Inland water transport using the Ganga-Meghna-Brahmaputra river system could be effective in improving the freight transport system in the region. A recent ADB study¹⁵ suggested that rehabilitation and improvement in inland water transport facilities in this water basin between India and Bangladesh could reduce the cost of trade between the two countries. Similarly, the technical standardization of the railway system between Bangladesh, India, and Pakistan could significantly reduce the costs of transportation, by substituting a land route for the current long and costly transport through congested seaports.

H. The Way Forward

42. For the 11th FYP (2007–2012), the Planning Commission prepared an approach paper in June 2006. This official paper of the Government indicated that infrastructure inadequacies in both rural and urban areas are a major constraint on India's growth."¹⁶

43. The approach paper indicated that for India to achieve the expected continued growth in GDP of about 9% per year, investment in infrastructure (including road, rail, air, and water transport) will need to be increased. Recognizing that this would place a heavy burden on scarce public sector resources, the approach paper advocates the promotion of PPPs for many infrastructure investments.

¹⁵ ADB. 2000. *Cooperation in Transport and Communications*. Manila.

¹⁶ Planning Commission. 2006. *Approach Paper to 11th FYP (2007–2012)*. New Delhi.

44. In the road and highway subsector, the approach paper reaffirmed the NHDP program under NHAI, with its further expansion to include NHDP V (6,500 km six-laning of the Golden Quadrilateral), NHDP VI (1,000 km of expressways during the 12th FYP period), and NHDP VII (consisting of bypasses and ring roads, with priorities, total length, and other details still to be determined). All NHDP contracts from NHDP III onward would be awarded only on a BOT basis, with traditional engineering, procurement, and construction contracts awarded only in exceptional cases. The paper also reaffirmed an acceleration of the PMGSY program to connect with all-weather rural roads by 2008–2009 all communities with a population of 1,000 or more (500 or more for hilly and tribal areas).

45. Priority will be given in the 11th FYP to ensure the integrated development of the road network, including state highways, major district roads, and other district road within the jurisdiction of the state governments, together with the rural roads system.

46. Other new initiatives in the road subsector that are expected to be included in the 11th FYP are as follows:

- (i) More attention to road and bridge maintenance activities, with additional funding being allocated for the 2006–2007 to 2009–2010 period;
- (ii) Restructuring of NHAI to strengthen the professional skills of its staff and provide the organization with a greater measure of autonomy and accountability; and
- (iii) Establishment of an organization dedicated to the promotion of road safety, in recognition of the enormous human and economic losses caused by the very high number of serious traffic accidents on Indian roads. In addition, 1% of the fuel cess is to be earmarked for safety-related measures.

47. In the railway subsector, the paper recognized the progress made by the Indian Railways in 2005–2006 because of improved productivity, but also noted that capacity bottlenecks and constraints still exist within the system—particularly affecting the efficient movement of containers to and from the major ports. During the 11th FYP, dedicated rail freight corridors will be developed on critical routes (e.g., Delhi-Mumbai and Delhi-Howrah). The paper also postulated that opening container services to more service providers would improve levels of service and enable Indian Railways to regain some of its lost market share.

48. In the past few decades, consistent with worldwide experience, the railway subsector has lost its share of the freight and passenger markets to roads. For example, the Indian Railways' share of the total cement transportation fell from a monopolistic 80% 3 decades ago to about 40% in 2001.¹⁷ The Poulouse Committee report of 1995 indicated that Indian Railways' competitiveness with respect to long-distance freight haulage had been reduced from an absolute advantage over road freight for distances over 250 km to an advantage on distances over 750 km, i.e., Indian Railways was steadily losing traffic to roads in the range between 250 km and 750 km. There has been a growing awareness within Indian Railways of the need to reverse this trend. The 2006–2007 budget announced various policy- and tariff-related measures to recover the market share, such as PPPs in customer amenities and rationalized passenger tariffs. These are in line with these overarching initiatives that are expected to be included in the 11th FYP:

- (i) Various steps to improve levels of service, including the establishment of logistic parks and terminals, the rationalization of freight structures, and increased use of information technology-enabled services;
- (ii) Focus on the use of PPP in building and operating selected railway infrastructure to increase capacity; and

¹⁷ Expert Group on Indian Railways. 2001. *The Indian Railways Report*. New Delhi.

- (iii) More attention to steps to modernize the railway, including the provision of good-quality passenger amenities at terminals, modern rolling stock, and improvements in sanitation, and modified wagon designs to increase payload-to-tare ratios.

49. Since 2004, rail tariffs have been set with a conscious focus on the market. Bulk commodities such as iron ore, cement, petroleum, and iron and steel saw a reduction in tariff and an increase in the share of freight carried by the Indian Railways in 2005–2006. Combined with the major initiative of increased axle loading, the Indian Railways managed a 10.8% increase in loading and 17.9% increase in freight revenue. This resulted in net revenue of \$1.76 billion and an investible surplus of \$2.86 billion in 2005–2006. These figures are a significant increase from 2004 to 2005. Similar growth is expected for 2006–2007.

50. Despite this progress, the Indian Railways has a long way to go before it can recover its share of the passenger and freight transport market. The Planning Commission's approach paper for the 11th FYP suggests that consideration should be given to ways of reorganizing Indian Railways' structure to enable more focus and concentration on the core activities of the provision of infrastructure and rail operations. The paper suggests that the manufacture and maintenance of rolling stock should be corporatized, and some other current Indian Railways activities outsourced. The paper also addresses passenger and freight tariff rationalization to counter the apparent loss of overcharged rail passengers to improving air services, and overcharged rail freight users to road transport services. To achieve a rational pricing basis for rail services, the paper emphasizes the need to establish a rail tariff regulatory authority.

TRANSPORT SECTOR MONITORING FRAMEWORK

A. Risks, Performance Monitoring, and Evaluation¹

1. The 2003–2006 country strategy and program for India is based on past performance, needs, and assessment of the country's absorptive capacity. The Asian Development Bank (ADB) is supposed to monitor risks and to make midcourse corrections as required. These changes may also be required in response to changing conditions, including new policy developments. ADB's assessment of the main risks and associated mitigating factors is summarized in Table A5.1:

Table A5.1: ADB Program in India—Risks and Mitigating Factors

Risk and Risk Assessment	Mitigating Factors
External shocks such as war, drought, oil shock (medium risk)	Exogenous risks cannot be fully eliminated. However, large stocks of food and foreign exchange are strong mitigating factors.
Macroeconomic instability due to failed fiscal consolidation (high risk)	Addressing this challenge is the highest priority in the CSP. ADB will actively help the Government in fiscal consolidation, at the center and in the states.
Reversal of structural reforms (low risk)	All leading political parties are committed to reforms, so risk of reform reversal is low.
Inadequate poverty reduction or social development despite high growth (low risk)	The 10 th Plan, ADB, and other development partners are all strongly focused on reducing poverty and accelerating social development.
Failure to deliver the medium term program due to staff constraints (low risk)	Efforts are being made to ensure that staff constraints do not impede the delivery of the program, by strengthening INRM staff and headquarters staff, internal redeployment within SARD, and other measures.
Failure of outcomes due to poor project quality at entry or poor implementation (medium risk)	Efforts are being made to improve project quality at entry, and to strengthen the capacity of implementing/executive agencies through regular training programs and strengthening of the portfolio management system at INRM.

ADB = Asian Development Bank, CSP = country strategy and program, INRM = India Resident Mission, SARD = South Asia Department.

Source: Asian Development Bank.

2. ADB monitors country and portfolio performance using four blocks of performance indicators, which are reflected in the poverty reduction partnership agreement:

- (i) **Block 1** consists of macroeconomic targets (growth, inflation, fiscal deficit, public debt) and the balance-of-payments outlook (current account balance and foreign exchange reserves position). The targets are derived from the 10th Five-Year Plan, budget documents, and the central bank's policy announcements.
- (ii) **Block 2** consists of poverty reduction and other human development targets adopted for the 10th Five-Year Plan and Millennium Development Goals.
- (iii) **Block 3** consists of the reform milestones and other sector performance targets indicated in the sector road maps (see following).
- (iv) **Block 4** consists of the loan and technical assistance pipeline, which is updated in annual country strategy and program updates, and portfolio performance indicators. This figure should have been reduced to not more than 10% by 2006. Disbursement and contract award performance should be maintained consistently above the ADB norm.

3. Country program and portfolio performance is evaluated against annual or medium-term targets set for each block, which is reflected in the poverty reduction partnership agreement. According to ADB's business processes, the regional management team is primarily responsible for implementing the program, supported by the country team. The teams closely monitor the performance indicators to ensure the successful implementation of the country strategy and program.

¹ Extracts from ADB. 2006. *Country Strategy and Program (2003–2006): India*. Manila.

B. Implementation and Monitoring

4. To secure the smooth implementation of projects, ADB has taken a number of actions with respect to preparatory processes:

- (i) establishing a project implementation unit before loan effectiveness;
- (ii) implementing advance procurement actions and award of civil works contracts before loan effectiveness;
- (iii) ensuring that utilities and other encumbrances are removed before construction; and
- (iv) increasing the size of civil works contracts to avoid a large number of small contracts.

5. Entering new subsectors or extending assistance to new executing agencies would hinder smooth project implementation. ADB will also attempt to secure the firm commitment of the Government to implement institutional and policy reforms in a timely manner, and make sure to secure local counterpart funds before committing itself to extend a loan to the Government.

6. Increased efforts have been made to develop a more consistent and measurable set of performance monitoring indicators, as shown in Tables A5.2–A5.4 for the transport sector modes of current interest to ADB. For instance, for the road sector, a uniform set of indicators will be used for the systematic collection of data, to be adopted for monitoring purposes by ADB and the World Bank.

Table A5.2: Road Map for the Road Subsector

Items	Indicators				
	5 years ago	Currently	In 5 years	In 10 years	In 15 years
A. Sector Outcomes					
Reduction in travel time (average cruising speed of trucks)	Not applicable	40 km/hour	50 km/hour	60 km/hour	70 km/hour
Reduction in fatalities per 10,000 vehicles	Not applicable	21	16–18	12–15	9–12
B. Sector Outputs					
(i) National Highway Capacity expansion (% of four-lane roads)	1	4	20	25	30
(ii) State Roads Improved riding condition (% of good condition roads): roads whose international roughness index is less than 4)	Not applicable	11	20	30	40
(iii) Rural Roads Improved rural connectivity (%)	Not applicable	60	80	90	100
C. Sector Issues and Constraints	<ul style="list-style-type: none"> • Lack of separation between policy and implementation functions of the Government • Establishment of an efficient highway management authority, including reformed public works departments • Lack of funds for highway development • Need to increase private sector participation • Need to reform the existing arrangement for road maintenance in terms of institutional set up and financial resources • Need to enhance project improvement capacity of road agencies • Need to enhance road safety measures • Need to strengthen the capability of highway authorities to address environmental and social issues, including resettlement and HIV/AIDS 				
D. Actions, Milestones, and Investments	Issue	Schedule	Agency (\$ million)		
			ADB	Others/ External	Government
	- Sector loans to national highway	2000–2006	2,000	1,500–2,000	9,000
	- Sector loans to state roads	2002–2006	800	600	10,000
	- Sector loans to rural road	2003–2006	800	500–700	10,000

km = kilometer.

Source: ADB. 2003. *Country Strategy and Program (2003–2006): India*. Manila.

Table A5.3: Road Map for the Railway Subsector

Items	Indicators				
	5 years ago	Current	In 5 years	In 10 years	In 15 years
A. Sector Outcomes					
Average annual growth in freight traffic over the previous 5 years (%)	2.4	2.6	3.0	3.5	4.0
Operating ratio (%)	90	91	86	82	80
B. Sector Outputs					
Maximum speeds for freight trains on Golden Quadrilateral (kph)	80	80	100	100	100
Average freight train speed (kph)	23	23	30	35	45
Train accidents per million train-km	0.57	0.64	0.57	0.40	0.35
C. Sector Issues and Constraints	<ul style="list-style-type: none"> • Lack of commercial orientation • Service inefficiency • Loss of market share • Investment backlog • Declining financial performance • Distortions in freight and passenger tariffs • Proliferation of noncore activities 				
D. Actions, Milestones, and Investments	Issue	Schedule	Agency		
			ADB	Others/ External	Government
	Phase I of Reform Program, 2002–2005				
	Policy				
	- Delineate social and commercial objectives	2003–2005	2002 loan		Policy change
	- Rationalize tariff	2002–2005	2002 loan		Policy implementation
	Institutional				
	- Upgrade cost accounting system	2002–2005	2002 loan		Counterpart staff/funds
	- Restructure core business	1999–2002	2002 loan		Policy change
	- Start restructuring noncore activities	2002–2005	2002 loan		Counterpart staff/funds
	- Increase private sector Participation	2002–2005	2002 loan		Counterpart staff/funds
	- Reengineer business Processes	2002–2005	2002 loan		Counterpart staff/funds
	- Right size staff strength	2002–2005	2002 loan		Policy implementation

	- Institutionalize improved investment selection	2002–2005	2002 loan		Counterpart staff/funds
	Investment - Expand capacity on main freight routes	2003–2007	2002 loan	World Bank, to be determined	Counterpart staff/funds
	- Ensure safety	2003–2007	2002 loan	World Bank, to be determined	Counterpart staff/funds

kph = kilometers per hour.

Source: ADB. 2003. *Country Strategy and Program (2003–2006): India*. Manila.

Table A5.4: Road Map for the Inland Waterway Subsector

Items	Indicators				
	5 years ago	Current	In 5 years	In 10 years	In 15 years
A. Sector Outcomes National Waterways Volume of cargo (in ton-km) moved by inland waterways	Not applicable	1.5 billion	20.0 billion	30 billion	60 billion
B. Sector Outputs National Waterways Capacity expansion (length of national waterways navigable 24 hours a day all year round)	200 km	200 km	5,195 km	7,000 km	8,000 km
C. Sector Issues and Constraints	<ul style="list-style-type: none"> • Poor infrastructure for navigation, storage, and intermodal transfer • Inadequate number of vessels • Institutional strengthening of IWAI • Improvement of the operating and financial performance of the Central Inland Water Transport Corporation • Lack of funds for inland waterway development • Need to increase private sector participation • Need to formulate an arrangement for inland waterway maintenance in terms of institutional set up and financial resources • Need to enhance project implementation capacity of inland waterway agencies 				
D. Actions, Milestones and Investments	Issue	Schedule	Agency (\$ million)		
			ADB	Others/ External	Government
	- Sector lending to IWAI	2004	150		100
	- Sector lending to IWAI	2006	150		100
	- Restructuring of CIWTC	2004			

CIWTC = Central Inland Water Transport Corporation, IWAI = Inland Waterways Authority of India, km = kilometer.

Source: ADB. 2003. *Country Strategy and Program (2003–2006): India*. Manila.

IMPLEMENTATION DELAYS

A. Summary of Implementation Issues

1. Table A6.1 below summarizes the implementation issues for each of the Asian Development Bank (ADB)-assisted projects.

Table A6.1: Implementation Issues

Loan Number	Project	Amount (\$ million)	Effective Date	Closing Date	Implementation Issues	FIRR/EIRR Overall Rating
A. National Highways						
1274	National Highways	245	4-May-95	1-Dec-01	Construction completion delayed by 12 months. Delay caused by change in scope, land acquisition problems, and administrative delays.	No PCR available.
1279	Bombay-Vadodara Expressway Technical Assistance	12.7	Loan cancelled		Difficulties in securing land were envisaged, in view of the earlier experience with the Ahmedabad-Vadodara Expressway Project. Major change in scope with the Government opting to go with widening (four-laning) the national highway before constructing an expressway.	
1747	Surat-Manor Tollway	165	8-Nov-00	30-Sep-05	Delayed by 2 years. Causes of delays were contractor problems and increase in scope of works. Rising numbers of traffic accidents after completion are a cause of concern, although there has been a decline in fatalities rate.	EIRR on completion not available.
1839	Western Transport Corridor	240 (reduced to 191.5 in 2005)	4-Feb-02	30-Jun-08 (previous closing date 31-Dec-05)	Project delayed. Only one civil works package (Sira-Tumkur), 41.4 km completed; poor performance by contractors on three packages. Likely replacement of a contractor. Project already delayed by 2.5 years. Capacity-building activities for NHAI having limited impact.	Project ongoing.
1944	East-West Corridor	320	19-Nov-03	30-Jun-08 (previous closing date 31-Dec-06)	Initial delays caused by prolonged procurement, land acquisition issues, and poor contractor performance. Progress improved in the last year.	Project ongoing.
2029	National Highway Corridor (Sector) I	400	25-Jan-05	31-Dec-07	Construction started October 2005. State government has withdrawn forest clearance in RJ-8 and requested realignment of 8 km. Land acquisition problems continue. Slow progress in developing "safety zone" approach.	Project ongoing.

Loan Number	Project	Amount (\$ million)	Effective Date	Closing Date	Implementation Issues	FIRR/EIRR Overall Rating
2154	National Highway Sector II	400	15-Mar-06	31-Dec-08	Seven phase I civil works contracts awarded. Appointment of supervision consultants in process. This project is similar in scope to Loan 2029, with linkages to the development of O&M contracts on Loan 1747.	Project ongoing.
B. State Highways and Rural Roads						
918	Road Improvement	198	27-Mar-89	16-Feb-99	Completion delayed by more than 4 years because of a range of start-up and project/contract management issues during implementation. PCR (1999) rated project "generally successful," OED (2001) "successful."	PCR: EIRR 22.4%. PPAR: EIRR 20.7%
1041	Second Road	250	29-Jul-91	31-Dec-99	Completion delayed by 3 years because of similar range of start-up and project/contract management issues as in Loan 918. Problems with DPR and with one ADTA (TA 1402) to establish a state-level PMS. PCR (00) rated project "partly successful," because of time and cost overruns.	PCR: EIRR 12.4%
1870	West Bengal Corridor Development	210 (reduced to \$79.2 in 2005)	7-Jan-03	30-Jun-07	NH34 component withdrawn by Government. Problems in resolving resettlement issues, poorly performing PIU, and contractor issues on at least one civil works package.	Project ongoing.
1958	Madhya Pradesh State Roads Sector Development Program (Program Loan)	30	16-Dec-02	29-Mar-06 (previous closing date 30-Jun-05)	MPRDC established as a semiautonomous road authority, but with mostly ex-PWD staff on deputation. Successful training of MPRDC staff on new systems, but no similar development of existing PWD staff. Program to be extended to include PWD.	Project ongoing.
1959	Madhya Pradesh State Roads Sector Development Program (Project Loan)	150	16-Dec-02	30-Jun-08	Difficulties in identifying subprojects because of stringent selection criteria. Some concern regarding quality of DPRs. Slow mobilization and inefficient use of resources by contractors.	Project ongoing.
2018	Rural Roads Sector I	400	25-Jan-05	30-Jun-08	MPRRDA not satisfied with PMCs and PICs. Poor response from contractors to tenders for works in remote parts of Chhattisgarh.	Project ongoing.
2050	Chhattisgarh State Roads Development Sector	180	14-Jan-05	31-Jul-09	Agency for road development yet to be formed, and delays in staffing of PIU. Procurement for phase I (800 km) civil works tenders complete. Delays in mobilization of consultants.	Project ongoing.

Loan Number	Project	Amount (\$ million)	Effective Date	Closing Date	Implementation Issues	FIRR/EIRR Overall Rating
C. Railways						
857	Railways	190	1-Mar-88	30-Jun-98 and 31-Mar-04	Very slow implementation by IR and, although transfer of technology successfully implemented, this delayed project completion by 6 years. PCR (99) rated project "successful." Lack of adequate supervision by ADB resulted in slower resolution of project management issues.	PCR: EIRR 15.0%
1140	Second Railways	225 (reduced to \$104.8)	1-Jun-92	8-Dec-99	PCR (00) rated project "less than successful." Poor compliance by IR with some of the covenants (e.g., delays in provision of audited annual accounts, late submission of PCR, no meetings of implementing coordinating committee, poor project [i.e., non-"separate" Government and ADB] accounting). Project management and procurement problems continued.	PCR: EIRR Electrification:16.0% Third line: 28.7% BOXN wagons: 15.0% Unit exchange: 13.8%
1981	Railway Sector Improvement	313	26-Oct-04	30-Jun-08	Loan disbursements to 31 December 2005 only \$1.5 m (0.5%) because of procurement problems. Slow loan implementation and inadequate efforts being made to address resettlement issues. Unfamiliarity with ADB procedures continues. Lack of adequate supervision by ADB apparent.	Project ongoing.

ADB = Asian Development Bank, ADB = advisory technical assistance, DPR = detailed project report, EIRR = economic internal rate of return, FIRR = financial internal rate of return, IR = Indian Railways, km = kilometer, MPRDC = Madhya Pradesh Road Development Corporation, MPRRDA = Madhya Pradesh Rural Road Development Authority, NH = national highway, NHAI = National Highways Authority of India, O&M = operation and maintenance, OED = Operations Evaluation Department, PCR = project completion report, PIC = project implementation consultant, PIU = project implementation unit, PMC = project management consultant, PMS = pavement management system, PPAR = project performance audit report, PWD = Public Works Department, TA = technical assistance.
Source: Operations Evaluation Mission.

1. Roads and Highways Subsector

a. Completed Projects

2. Table A6.2 lists the completed projects as of 31 December 2006.

Table A6.2: Projects Completed

Loan Number	Project	Outputs Achieved on Completion	Delay in Completion	EIRR at Appraisal	EIRR at Completion	Project Rating
918	Road Improvement Project	National Highways – 157 km State Highways – 386 km	4 years	35.7%	22.4% (based on PCR) and 20.7% (based on PPAR)	Efficient
1041	Second Roads Project	National Highways – 141 km State Highways – 554 km	3 years	43.1%	12.4% (based on PCR)	Efficient
1274	National Highways Project	National Highways – 330 km (as assumed from RRP, since no PCR was available)	2 years	37%	Not available (No PCR)	Efficient
1747	Surat-Manor Tollway Project	National Highways – 175 km	1 year	25%	Not available (No PCR)	Efficient

EIRR = economic internal rate of return, km = kilometer, PCR = project completion report, PPAR = project performance audit report (postevaluation report), RRP = report and recommendation of the President (appraisal report).

Source: Asian Development Bank.

i. Loan 918-IND: Road Improvement Project

3. The project completion report rated the first ADB road improvement loan project “generally successful.” Although the recalculated overall economic internal rate of return (EIRR) was high, it was lower (22.4%) than at appraisal (35.7%) because of delays in implementation, construction cost increases, and lower-than-expected traffic growth. The evaluation team assessed the findings of the project completion report and found them to be generally valid. The total number of traffic accidents increased significantly in 1995–1998 in all states where roads were improved, but traffic fatality rates decreased by over 50% in all states since the road improvements had included the construction of road dividers. A 2001 project performance audit report¹ for this project assessed it as successful. It concluded that the project was relevant, in that it had contributed to the Government of India’s efforts to improve the road network; that it was effective, as transport constraints had eased and vehicle operating cost savings had been realized; and that it had promising prospects for sustainability because the completed roads were being relatively well maintained in spite of constraints on maintenance funding. Institutional benefits were incidental, with the executing agencies only learning from mistakes made during implementation, and the intended developmental impacts from the technical assistance (TA) did not materialize. However, the recalculated overall EIRR in the project performance audit report (PPAR) was 20.7%, with one road section at less than 12%. These findings of the PPAR were validated by the evaluation team and the project is rated efficient.

4. This loan included a TA,² which concluded that decisions for maintaining roads in both Andhra Pradesh and Tamil Nadu continued to be made on standard norms rather than using the pavement management system that had been developed by the TA. The TA completion report concluded that the TA had been unable to institutionalize or generate ownership of the pavement management system within the two states, although the public works departments (PWDs) had gained some awareness of the benefits of having systematic road maintenance management systems.

5. The evaluation team inspected one of the subprojects linking Ballabgarh with Mathura in Uttar Pradesh, part of NH2 linking Delhi with Agra. There has been an increase in the traffic on this route, which caters to the tourists traveling to Agra. During the inspection between Delhi

¹ ADB. 2002. *Project Performance Audit Report on the Road Improvement Project in India*. Manila.

² ADB. 1989. *Technical Assistance to India for Pavement Management*. Manila (TA 1058-IND, for \$490,000, approved on 3 January).

and Agra,³ the evaluation team observed sections under construction, and sections in rural areas operating as four-lane, undivided highways. In several peri-urban areas, the service roads were almost fully occupied by parked trucks awaiting repair at the many repair shops located along the road. At the border between Delhi and Haryana state, the evaluation team observed the considerable congestion caused by vehicles parked on the carriageway, while drivers had to find off-road offices to pay the border-crossing fees. This operation causes congestion and is an undesirable, time-consuming process.

ii. Loan 1041-IND: Second Road Improvement Project

6. The project completion report for the second road loan project gave it a “partly successful” rating, mainly because of time and cost overruns. The recalculated EIRR was only 12.4%, compared with the 43.1% estimated at appraisal, because of the start-up delays, lower-than-expected traffic volumes, contractor issues, and institutional weaknesses in the executing agencies (particularly the PWDs administering the state road components). There were also problems with the detailed project report. These included field surveys during construction start-up not matching the detailed project report planning, rail-over-road bridge complications (involving the Indian Railways), and safety issues during construction that were not addressed in the road designs. Despite these delays, the project did result in an EIRR that was slightly more than ADB’s 12% benchmark. For this reason, the project is rated efficient.

7. The project completion report noted that traffic fatalities had decreased significantly from 1993 to 1999 on the improved sections of NH47 in Kerala (by 40%), but had increased slightly on the improved sections of NH8 in Rajasthan. The reasons for this related to the lack of road safety awareness of local road users in Rajasthan. The evaluation team has validated the findings of the project completion report.

8. The problems experienced during these initial roads and highways projects had been anticipated by ADB’s transportation specialists.⁴ The situation today shows that while there has been some improvement, much work remains to be done before implementation delays are eliminated.

iii. Loan 1274-IND: National Highways Project

9. Approved in November 1993, the project was delayed by more than 2 years with loan closure in December 2002 and with higher completion cost attributed to price escalation, delays, and increase in scope of works. Despite the requirements that project completion reports be prepared within 12–24 months of loan closing, no project completion report has been prepared for this project. The loan was prepaid in 2003 with the Government accessing lower-cost refinancing. The project faced initial delays pending the establishment of the National Highways Authority of India (NHAI), which were worsened by problems with procurement and land acquisition. The loan covenant relating to the use of axle load enforcement equipment was not complied with. Without a project completion report and an economic analysis, the process efficiency of the project was assessed to be poor. The base EIRR at appraisal was estimated at

³ ADB. 1988. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to India for the Road Improvement Project*. Manila (Loan 918-IND, for \$198 million, approved on 10 November) included a 111-km section between Ballabgarh and Mathura on the Delhi-Agra NH2.

⁴ An ADB internal report in October 1992 cautioned that it would be difficult to build a new road construction industry overnight through such massive projects (Loans 918-IND and 1041-IND). While the staff concerned felt that the construction industry would develop ultimately for the initial projects, the report said that ADB must accept that there will be delays, and probably failures.

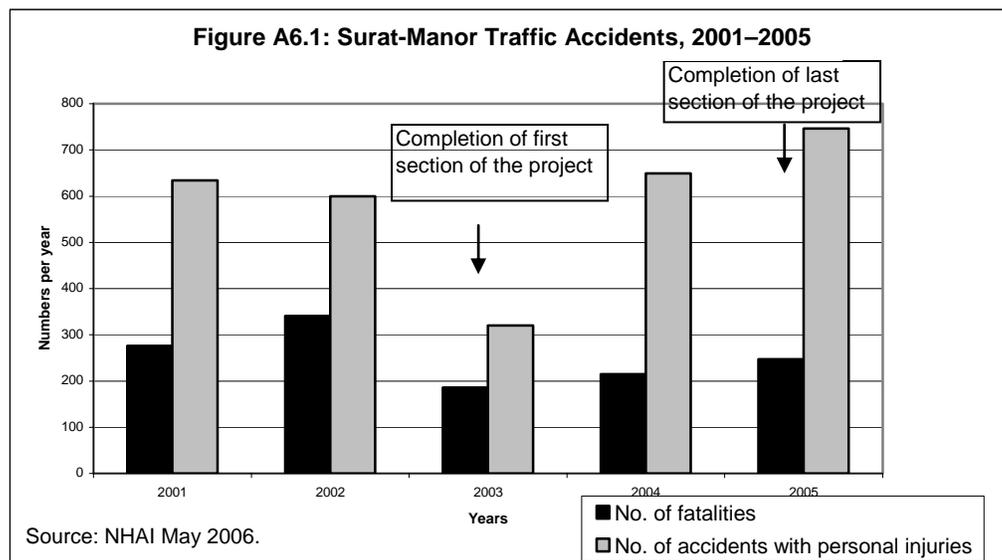
37%. Allowing for optimistic forecasts, project delays, and lower traffic growth, the EIRR at completion could still be above the benchmark 12%. In view of this, the project is rated efficient.

iv. Loan 1747-IND: Surat-Manor Tollway Project

10. The project (Loan 1747) was completed in late 2005, after a delay of 15 months. Besides contractor problems, this overrun could be attributed to the increase in the scope of works. The evaluation team visited the Surat-Manor Tollway (NH8) in Maharashtra and Gujarat states (see photographs in Appendix 14). The highway was developed from its original two-lane configuration in three packages, the first of which was completed in 2003 and the last two in 2005. The four-lane, dual-carriageway tollway was found to be in generally good condition, with good lane marking and edge delineation, but insufficient signage and inconsistent use of language on signs to inform the public of safety measures, emergency telephone numbers, etc. There are safety concerns regarding uncontrolled intersections, the several median openings, the hazardous end treatment of crash barriers, the unconstrained roaming of cattle on the highway, and the limited number of crossing facilities for pedestrians in urban areas. NHAI traffic data indicate that current traffic levels are less than expected (an average two-way average daily traffic in 2005 of about 21,000 vehicles per day on the busiest section, against an original estimate of 28,000 vehicles per day by 2007, with annual average growth rates of 6–8%). Trucks made up 35–76% of the total traffic flow in 2003, with the highest percentages closest to Mumbai. Truck traffic has reduced in percentage terms since 1997 (by 6–10%), with the highest traffic flow growth being in private cars, jeeps, and sports utility vehicles (an increase of 30–112%).

11. The project EIRR estimated at appraisal was 25%. Considering the lower growth in traffic, the EIRR should be less than 25% at completion, but is likely to be above the benchmark 12%. In view of this, the project is rated efficient.

12. Figure A6.1 shows the accident statistics on the 180-km Surat-Manor Tollway. Serious traffic accidents continued to occur during the construction period, but after the first section was completed in 2003, the number of fatalities and accidents causing personal injury dropped dramatically (fatalities by over 45%, injuries by over 46%) compared with 2002. Accidents causing fatalities and injuries increased significantly in 2004 and 2005—fatalities by about 15% in both 2004 and 2005, injuries by over 100% in 2004, and again by 15% in 2005. Having separated carriageways for two-way traffic helped to reduce head-on collisions, but the wider (four-lane) roadway results in higher speeds and causes difficulties for pedestrians wishing to cross, who do so at some personal risk. Despite the increase in fatalities in 2004 and 2005 and the higher levels of traffic, the number of fatalities remains below the levels experienced in 2001 and 2002 before the project.



13. A permanent weigh-station is in operation on one section of the tollway, where the weight of all trucks using the tollway is checked and recorded. Drivers whose load exceeds the legal limit are fined, but are allowed to proceed back onto the tollway without first having to off-load their excess cargo.⁵ Operators at the weigh-station observed that the overloaded trucks constitute about 30% of the truck traffic. These are predominantly rigid-axle vehicles, which do most damage to roads. The weigh-station has no equipment for off-loading cargo and no facilities for secure storage.

14. The evaluation team observed a lack of adequate pedestrian crossings on the highways. Traffic control devices (traffic signals, signs, and road markings) were inconsistent and generally insufficient to give the required advice and guidance to drivers. Although there are speed limits, they were rarely enforced. The lack of traffic police or other enforcement agents was apparent.

b. Ongoing Projects

15. Table A6.3 provides a summary of the ongoing ADB-supported projects, all of which were approved since 2001.

16. All the ongoing projects have an estimated EIRR higher than the benchmark 12% rate. However, they face substantial implementation delays. While the EIRRs of these projects are high, the implementation delays are likely to affect their realization at completion owing to the rise in project costs, delayed receipt of expected benefits, and lower-than-expected traffic build-up. Table A6.3 provides an indication of the worst-case scenarios, which are close to the benchmark 12% rate, and in two cases lower. Because of the long implementation delays and the resulting adverse implications for EIRRs, all ongoing projects are rated less efficient, pending the completion and recalculation of EIRRs. This rating mainly reflects the process efficiency, which has been poor for all projects.

⁵ During the evaluation mission, the Indian Supreme Court passed regulations that required all transport authorities to enforce the legislation prohibiting the practice of overloading trucks.

Table A6.3: Ongoing Projects

Loan Number	Project	Outputs Targeted (km)	Current Estimated Delay (years) ^a	Project EIRR at Appraisal (%)	Worst-Case EIRR Sensitivity at Appraisal (%)
National Highways					
1839	Western Transport Corridor	259	2.5	36.0	33.1
1944	East-West Corridor	505	1.5	22.0	18.8
2029	National Highway Corridor (Sector) I	662	2.0	22.9	16.2
2154	National Highway Sector II	566	1.5	14.9	10.1
State Highways					
1870	West Bengal Corridor Development	150	2.0	21.0	14.9
1959	Madhya Pradesh State Roads Sector Development Program (Program and Project Loans)	1,750	1.6	25.0	15.6
2050	Chhattisgarh State Roads Development Sector	1,700	1.3	17.5	8.2
Rural Roads					
2018	Rural Roads Sector I	11,000	1.6	26.6	17.0

EIRR = economic internal rate of return, km = kilometer.

^a These estimates are based on the information provided in project performance reports, using a combination of elapsed loan period and project progress.

Source: Asian Development Bank.

i. National Highways

17. The evaluation team visited the national highway projects in Chhattisgarh that have been or are being developed on a build-operate-transfer (BOT) basis, without ADB assistance. The visits enabled a cursory field assessment of any evident operation and maintenance or safety benefits from private sector involvement in these activities. A section of NH6 is being upgraded, on a BOT basis, to serve as the southern entrance to Raipur. Inspection of the work site (both at night and in the daytime) revealed the inadequacy of signs warning drivers of diversion schemes and construction activity. Where the new, dual-carriageway has been completed (with service roads on both sides), there was inadequate provision of safe-crossing facilities for pedestrians on an intensively commercial section of the road. On this straight section, vehicle speeds tend to be high, yet road signs were inadequate. On the other side of Raipur, the evaluation team visited the Durg bypass, which was completed in 1998 and was one of the early BOT projects developed by NHAI. The road has been maintained under the BOT contract, but the riding surface is uneven, with signs of poor maintenance practices. The bypass also has no centerline road marking and few traffic signs. Discussions with PWD officials indicated that although the BOT contract was being managed by NHAI, adequate remedial action was not taken. This underlines the institutional capacity issues faced by the NHAI.

18. The road construction industry finds it difficult to cope with the demands placed on it by India's extensive road improvement and network expansion program. These issues are common across national, state, and rural road projects, whether funded by the Government, ADB, or other development partners. The presence of international contractors has had no value addition since these contractors do not provide sufficient managerial, technical and financial inputs in the implementation. The World Bank-sponsored road projects in India face problems similar to those reported for ADB projects. The industry, in general, faces the following key problems: (i) only five or six major Indian contractors can provide the requisite services (including staff) on BOT national highway schemes and all have full order books; (ii) qualified

professional engineers with road construction experience in India are in short supply, and new graduates are being attracted away from the industry by higher salaries in other fields, notably information technology; and (iii) road projects in some states and in remote areas have staffing problems because of commercial risks, security issues (some contractors have had equipment destroyed), and poor living conditions. ADB's sole intervention on this subject was an advisory technical assistance (ADTA) to study the road construction industry in 1990, with the completion report coming out only in 2000. Although the ADTA was found to be useful, ADB must provide more assistance to the industry in institutional strengthening and capacity building.

ii. State Highways

19. The pre-2001 ADB projects involved with state road improvements encountered some of the same implementation problems experienced by the national highway projects. Because of the unfamiliar contracting processes associated with ADB projects, the PWDs concerned were reluctant to delegate responsibilities to supervision consultants. Delays were a feature of preconstruction activities, including site clearance and the setting up of project implementation units and their subsequent poor management of the civil works.

20. The West Bengal Corridor Project, concerned with improving national, state, and rural roads, was adversely affected by the poor performance of the project implementation unit in the early period, problems with slow progress on civil works resulting in the termination of contractors, and resettlement issues. The Government opted to withdraw a subproject from ADB financing, since it intended to expand the scope of the subproject to widen the road and the expansion was likely to raise involuntary resettlement issues. The decision to withdraw from ADB financing was taken to ensure that the subproject was completed on schedule and without the delays the executing agency thought could be associated with complying with ADB's social safeguard policies.

21. However, the corollary of selecting only those projects that do not involve safeguard issues appears to be unworkable as seen in the Madhya Pradesh State Roads Project, where there have been difficulties in identifying such "ideal" subprojects. Since 2002, ADB has provided a combination of program and project loans to the state government of Madhya Pradesh, thus serving the dual purpose of capacity development and capital investments. The Madhya Pradesh project loan was aimed at rehabilitating state highways without safeguard issues. In other words, roads that were environmentally sensitive or involved resettlement were specifically excluded from the scope of ADB assistance. Although implementation was expected to speed up this way, excluding environmentally sensitive projects was counterproductive to the development of an integrated network. The executing agencies found it increasingly difficult to identify subprojects that had no safeguard issues, such that project implementation suffered major delays. Such incentives, which appear to be rational from the perspective of executing agencies and ADB staff, are unlikely to be what the ADB Board had in mind when it adopted ADB's safeguard policies.

22. The Madhya Pradesh loan included a program component that identified several policy actions as tranche release conditions. The Madhya Pradesh Government found it difficult to meet a key condition of the loan relating to the implementation of the staff rationalization program, which was not completed. This required a more realistic approach based on a sound analysis of a difficult problem that explicitly considered the views of various stakeholders. On the whole, the design of the state roads development program could be improved by taking into consideration the realities of each state.

23. The design of the two loans approved for state roads since 2002 tried to address the lessons learned from the earlier projects by establishing more effective and efficient state road sector management systems. The Madhya Pradesh State Roads Sector Development Program (Loan 1958) has resulted in the establishment of the Madhya Pradesh Road Development Corporation, whose responsibilities include road sector policy, resource management, development planning, and asset management within the state and overall management of state highways, including exploiting private sector participation opportunities. The institutional capacity building requirements of this program are being facilitated by a TA, with cofinancing support provided by the Department for International Development of the United Kingdom. The PWD of Madhya Pradesh is the executing agency for Loan 1959, which is aimed at rehabilitating state roads and highways in poor condition to provide reliable road transport services and support social and economic development. The project is to rehabilitate about 1,750 km of state roads using pre-established selection criteria relating to economic and social parameters. The civil works contracts and resettlement plans are being administered by the Madhya Pradesh Road Development Corporation and, by January 2006, all contracts had been awarded and four packages were being implemented. Progress is slow, however, because of delays in mobilization and the inefficient use of resources by contractors.

24. The quality of detailed project reports has been a problem across all the subsectors including the state highways. The Madhya Pradesh Road Development Corporation confirmed this and attributed the problem to the general lack of adequate skilled resources among consultants.⁶ With budget constraints, the cost of detailed project report preparation has been reduced along with the time available. This, combined with lack of adequate monitoring by the implementing agencies, results in poor road designs and contract variations. This problem is also common among national highway projects. In Madhya Pradesh, this problem is compounded by the lack of experience of the implementing agencies, ultimately resulting in poor-quality the detailed project reports. Discussions with officials indicated that it is commonplace to find that the detailed project report estimates of project cost are lower than the bidder's estimate or actual project cost. Similarly, traffic estimates have been found to be higher than actual figures.

25. Although the Madhya Pradesh Road Development Corporation appears to be well organized and is developing into an efficient road management agency as envisaged by the ADB program loan, the evaluation team noted that most of its staff are on deputation from the PWD. This gives cause for concern about the long-term sustainability of the organization and its new systems and procedures. The remaining PWD organization appears to be overstaffed and has (to date) been excluded from the capacity-building activities within the TA and program.⁷ Another element of concern in Madhya Pradesh is the fact that government officials see no need for a state road fund to cover road maintenance costs because (i) the Madhya Pradesh government is currently providing enough funds to cover the estimated cost of state-wide road maintenance needs; and (ii) in the past 2 years, the PWD has not been able to spend the funds allocated for road maintenance. While the lack of a state road fund appears to be a specific strategy of the state government, it runs counter to the intent of ADB's continued involvement in this subsector, which is to facilitate policy reforms and strengthen the PWD to improve the sustainability of the state roads and transport agencies. A dedicated road fund would enable systematic planning and prioritization of rehabilitation and maintenance activities in the state. While a road fund has its pros

⁶ This problem has been observed for both international and domestic consultants. The turnover of the consultants' staff could be a factor contributing to the poor quality of outputs.

⁷ This shortcoming was expected to be rectified late in 2006 when the institutional capacity building TA was to be extended to include the development of appropriate road management systems for the PWD in Madhya Pradesh.

and cons, the absence of a maintenance planning tool in the Madhya Pradesh government necessitates focused prioritization of its maintenance interventions.

26. Site visits to state highways improvement projects found the same set of issues seen on national highways—poor road signs, inadequate traffic signs and barriers at construction sites, and inadequate signs at road diversion sites, particularly at bridge and culvert works. Photographs in Appendix 14 illustrate these points. The Indian Roads Congress has developed guidelines/standards for the industry,⁸ but these are ignored by contractors and supervision consultants.

27. The Chhattisgarh State Roads Development Sector Project⁹ of 2003 has many similarities with the Madhya Pradesh Project. It is designed to support economic growth and reduce poverty in Chhattisgarh by providing improved connectivity and access to development opportunities and social services, including health and education. The project will finance the improvement of 1,700 km of state roads in Chhattisgarh, to improve network connectivity, and the improvement of priority road links between national, state, and rural roads. The goal is to improve access for rural/underdeveloped populations to the mainstream economy and development opportunities. There have been several start-up delays, including delays in staffing the project implementation unit, and mobilizing the project management consultants. ADB also provided assistance to help the project implementation unit with its start-up activities, but removed the assistance after 6 months, thus adversely affecting the development of the new unit. The detailed project reports for the planned roadworks have been prepared. The evaluation team noted their variable quality, which could have negative consequences once the roadworks start. The civil works contracts for the first phase are expected to be awarded in 2007, although there have been delays in finalizing contracts because of poor responses from contractors discouraged by the ongoing security situation in some rural parts of Chhattisgarh.

iii. Rural Roads

28. The Rural Roads Sector I Project¹⁰ covers Madhya Pradesh and Chhattisgarh within the Government's broader rural roads program (PMGSY). It is managed by the Ministry of Rural Development and the rural road development agencies at the state level, with the latter acting as executing agencies and project implementation units. In accordance with the basic goal of the PMGSY program, the project is aimed at reducing poverty and deprivation in the two states by providing better access to markets, employment opportunities, and social services to promote economic growth. This objective is to be achieved by providing rural inhabitants with all-weather road connections and improving safety on rural roads. The project scope includes the reconstruction and upgrading of 5,500 km of rural roads in both Madhya Pradesh and Chhattisgarh.

29. There have been delays in project start-up and in the mobilization of consultants in both Madhya Pradesh and Chhattisgarh. Consultants have also reportedly changed the composition of their teams after contract award. ADB's Integrity Division conducted an investigation into this matter and found that three international consulting firms had changed 84–92% of their team.

⁸ Guidelines on Safety in Road Construction Zones. Indian Roads Congress: SP:55:2001.

⁹ ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Chhattisgarh State Roads Development Sector Project*. Manila (Loan 2050-IND, for \$180 million, approved on 15 December).

¹⁰ ADB. 2003. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the Rural Roads Sector I Project*. Manila (Loan 2018-IND, for \$400 million, approved on 20 November).

Such changes in the team composition affect the implementation quality and schedules. Although the consultants' scope of activities includes training and awareness building among contractors and executing agencies, there has been no evidence of this. Another indicator of the adverse impact on the quality of consultants' outputs relates to the preparation of estimates as part of the detailed project reports. An evaluation made by the Planning Commission found that estimates prepared under the PMGSY are on the higher side, causing underutilization of the allocated budget.¹¹

30. The rural road development agency in Madhya Pradesh reported inadequate performance by both consultants and contractors, with a lack of on-site presence by supervisory consulting teams and of any effective training of contractors, as required by the consultants' terms of reference. No technical ADB mission had visited the project sites to assess the work activities. The construction sites are poorly managed in terms of traffic signs of the works and diversions. In addition, labor issues affecting contractor staff and other disputes were recorded as part of the evaluation socioeconomic study (Appendix 12). The evaluation team visit to Chhattisgarh found a similar situation with overall progress even less advanced because of issues with local contractors. Bid responses from contractors for works in remote parts of Chhattisgarh were poor because of security reasons as well as the size of contracts (too large for local contractors).

31. Despite low traffic, all rural roads were being paved to flexible asphalt concrete standards,¹² calling in question the economic viability of the roads because of the high cost of constructing paved roads. The rural roads have been over designed in terms of pavement thickness and materials used. Besides the high cost of construction, these roads are likely to incur high maintenance costs in the long run, prompting sustainability issues. The evaluation team noted that the funding for rural roads could have been better used if alternative low-cost technologies suited to rural roads had been explored.¹³

2. Railways

32. Appendix 1 summarizes ADB-supported loans for the Indian Railways, which have followed two main themes. In 1987–1991, ADB provided two loans to support the expansion of line and freight haulage capacity. After a decade in which no new railway loans were approved, ADB in 2002, approved a loan centered on a program of institutional and policy reforms to improve Indian Railways' commercial orientation,¹⁴ in parallel to its support for capital investment projects.

a. Completed Projects

33. The first rail project (Loan 857)¹⁵ included the provision of new electric freight locomotives, supported by the transfer of technology to enable their manufacture in India, together with the upgrading of Indian Railways' communications, signaling, workshop, and training equipment. Because of extensive delays during implementation, project completion was

¹¹ A sample project evaluated by the Planning Commission showed that the amount that remained unutilized on the completion of these projects varied from a minimum of 6.83% to a maximum of 32.19% (Source: Quick Concurrent Evaluation of PMGSY, Planning Commission).

¹² The designs, approved by ADB, use concrete pavement through villages.

¹³ For example, the use of sealed gravel roads is one option that could be explored for rural roads.

¹⁴ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Railway Sector Improvement Project*. Manila (Loan 1981-IND, for \$131.6 million, approved on 19 December).

¹⁵ ADB. 1987. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Railways Project*. Manila (Loan 857-IND, for \$190 million, approved on 10 November).

delayed by 5 years, with the transfer of technology component requiring a further 6 years. Despite these delays, the 1999 project completion report rated the project “generally successful” as Indian Railways’ freight haulage capacity had been increased and the transfer of technology had been achieved. The evaluation team validated the project completion report’s findings. The EIRR of 15% at completion was lower than the appraisal estimate (24.5%). However, since the EIRR is above the benchmark of 12%, the project is rated efficient.

34. The closing of the loan for the second rail project (Loan 1140),¹⁶ which included a range of physical improvements, and the procurement of wagons and spare parts, was delayed by 3 years. The 2000 project completion report rated the project less successful because of the poor compliance by the Indian Railways with some loan covenants, the less than full achievement of developmental impacts, EIRRs being less than at loan appraisal, and overall weak project management by the Indian Railways. Procurement for the project was overly complex. The evaluation team believes that the weaknesses in project management are attributable to the slow acceptance by the Indian Railways of ADB’s procurement policies, which were different from the Indian Railways. The Indian Railways officials, as a result, became overly cautious in evaluating tenders and in implementing the project. Moreover, supervision by the Indian Railways management and by ADB staff during implementation was also inadequate. Both the completed projects were, however, able to achieve the overall objectives of improving Indian Railways’ freight haulage capacity to meet the increasing demand, albeit with long delays. Despite the implementation issues, the project is rated efficient, since its EIRR is higher than the benchmark 12%.

b. Ongoing Project

35. Because of the Indian Railways’ continued resistance to fundamental policy reforms in the 1990s, ADB delayed further involvement in the rail subsector until a new policy reform-oriented loan project was approved in 2002. The new project was aimed at improving the performance of the rail subsector by supporting a program of prescribed institutional and policy reforms to develop the commercial orientation of the Indian Railways, expansion of core businesses, finance priority investments to overcome bottlenecks in capacity, and improve operational efficiency and safety. These reforms are expected to strengthen the Indian Railways’ accountability, transparency, and management. This reform program was agreed on between the Indian Railways and ADB and there appeared to be appropriate commitment, at the start, to implement it. This was supported by the fact that the reform program was tabled before the Parliament, an unprecedented step in the history of the Indian Railways. However, the program lost momentum for two main reasons. First, a change in the membership of the Indian Railways board¹⁷ diluted awareness of the reforms and enthusiasm for decision making. The turnover of ADB project officers also gave ADB staff few opportunities for policy dialogue with the new board members. Second, in the run-up to the national elections, there was a change in government from a coalition dominated by the Bhartiya Janata Party to one dominated by the Congress Party. This change led to uncertainty in the commitment of the new government to implement the reforms. However, in late 2006, consistent with the reform agenda, the Indian Railways initiated several measures to promote the use of private sector participation (Appendix 4).

¹⁶ ADB. 1991. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance to India for the Second Railways Project*. Manila (Loan 1140-IND, for \$225 million, approved on 5 December).

¹⁷ As in most other public sector organizations in India, the composition of the Indian Railways board changes periodically. Although institutional memory is strong, the speed of decision making slows down as new incumbents are disinclined to take major decisions.

36. The reforms now being implemented by Indian Railways are more at the macro level—restructuring core business activities, increasing private sector participation in container handling, and developing a commercial orientation by decentralizing authority. These are commendable steps. However, much remains to be done to improve decision making as part of the organizational restructuring and to provide better services. Thus, while progress is being achieved at the macro level, detailed reforms have yet to make headway.

37. While structuring and implementing such reforms in a large, complex organization was admittedly difficult, the evaluation team concluded that value-added support from ADB staff was also lacking.¹⁸ ADB project officers changed three times in 3 years, resulting in discontinuity. In addition, ADB project officers dealing with the Indian Railways did not have enough experience with railway reforms. Overall, there appears to be a need to delegate supervision to the India Resident Mission to enable more frequent dialogue with Indian Railways, which is crucial in implementing such complex reforms. But the India Resident Mission would need to be properly staffed and to have the required expertise for this responsibility.

38. The implementation of the capital investment component of the project has been delayed significantly and disbursements have been slow.¹⁹ A series of difficulties have been experienced in the procurement for civil works associated with rail system upgrades and the implementation of the specified policy reforms. Inadequate supervision by ADB staff adversely affected the capital investment component. For example, four issues could have been resolved with more effective supervision. First, ADB's procurement policy required detailed technical specifications including detailed costing; the unfamiliarity of the Indian Railways staff with these led to several delays. Second, the large integrated contracts that ADB required the Indian Railways to award drew a poor response from contractors and the apparent raising of prequalification criteria did not help matters. Third, there appears to be a distinct gap between ADB's involuntary resettlement policy and the country's national policy and laws, particularly with regard to replacement value and indigenous people. This gap has been further widened by the inability of ADB and Indian Railways to arrive at a mutually acceptable procedure and output for a resettlement plan, prompting the Indian Railways to withdraw an "urgent" project from ADB assistance. Fourth, the approval of reports by ADB was delayed in several instances. In one such instance, ADB took 8 months to approve a social report. The evaluation team noted that the first two issues have since been resolved, and progress is being made on the other two. This experience underlines the point that ADB must adopt a more flexible approach to implementing projects, rather than a standard approach for all countries.

2. Sources of Implementation Delays

39. A typical road project implementation schedule is in Figure A6.2. A comparison of this typical schedule with the actual implementation schedules identified several bottlenecks that appear to be common across projects.

40. The prime sources for the delays have been:

- (i) Project preparation and administration
 - (a) inadequate or inaccurate project preparation, especially the detailed project reports;

¹⁸ The reform program is supported by an ADB TA, which provides management consulting services to the Indian Railways to monitor policy reforms and advice on business opportunities (Appendix 8).

¹⁹ The project was approved in December 2002. By 31 December 2005, only 0.5% of the total loan had been disbursed, and by 31 August 2006, only 13%. By 31 December 2006, as against an elapsed loan period of 73%, the project progress was just 10%.

- (b) inadequate technical resources in executing agencies and implementing agencies;
 - (c) land acquisition and removal of encumbrances from the right-of-way;
 - (d) delays in the preparation and approval of resettlement plans;
 - (e) unclear environmental assessments and lack of familiarity with the requirements of environmental safeguards; and
 - (f) lack of procurement planning.
- (ii) Contractors' performance
 - (a) insufficient or inadequately experienced engineering staff of the consultant or contractor, resulting in poor performance by the overstretched supervision consultant or contractor;
 - (b) poor mobilization of equipment; and
 - (c) cash-flow problems of contractors due to low bid prices.

3. Project Preparation and Administration

41. The executing agencies across all the subsectors expressed concerns with the poor quality of the detailed project report preparation, which causes implementation delays. The cost of preparing a detailed project report, as well as the time available to prepare it, has been reduced over the years. This, combined with poor monitoring of the detailed project report process by the executing agency, results in inaccuracies in the detailed project reports and large contract variations. On the consultants' side, detailed project report preparation is perceived to be less lucrative than project supervision.

42. On the executing agencies' side, the staff have inadequate experience with the detailed project report process. The fact that most of the staff are on deputation also contributes to this problem. In the case of the NHAI, this is an important issue. NHAI staff have changed after project preparation. The inclination is to complete the immediate formalities of getting clearances for the project and the preparation of bid documents, rather than to verify the accuracy and quality of the detailed project report. Moreover, owing to the disparity in the procedures and requirements relating to environmental and social safeguards among the development partners, there remains a high degree of unfamiliarity within the executing agencies and implementing agencies about the implementation of these safeguards. In addition, the completed projects (e.g., Loan 1041) showed inadequate contract administration because of:

- (i) deficiencies in project management setup;
- (ii) lack of properly planning of works at the site;
- (iii) lack of appropriate financial management;
- (iv) insufficient resource mobilization by the contractor; and
- (v) lack of respect for contractual agreements.

43. Some of these issues have been mitigated. In the case of the NHAI, financial management has been streamlined, with better monitoring of project cash flows.

44. Acquisition of land is another major source of delay. Inadequate land records result in delays in finalizing compensation. This is aggravated by litigations initiated by aggrieved persons affected by the land acquisition. With the slow judicial system, the resolution of these cases causes delays.

45. The land acquisition problems are further accentuated by delays in the preparation and approval of resettlement plans. In the case of the Rural Roads Sector I Project, unfamiliarity with

ADB's procedures caused delays in the submission of resettlement plans by the executing agencies. Coupled with this is the systemic issue of delays within ADB due to the time taken to approve these plans by the various departments at ADB headquarters. There has been a move to delegate this responsibility to the India Resident Mission, but the transfer has not yet been made.

46. Complying with the environment safeguard for road projects is seen as basically fulfilling conditions of the Ministry of Environment and Forest and ADB or the World Bank rather than understanding the environmental issues.²⁰ As a result, project clearances take longer. Quite often this is caused by a lack of familiarity with the requirements. Making better use of consultants, developing and training government staff, and harmonizing ADB's and the World Bank's requirements with the laws and guidelines of the central and state governments could help in resolving this issue.

47. Procurement delays continue for various reasons:

- (i) Lack of procurement planning, although in the case of NHAI this has been remedied;
- (ii) Delays in contract award caused by unfamiliarity with ADB's procedures and insufficient delegation of authority;
- (iii) Inappropriate contractor packaging; and
- (iv) Poor assessment of contractors' capability during prequalification, resulting in delays in the later stages of procurement or in the implementation of the project.

4. Contractors' Performance

48. In almost every project, delays are caused by poor planning, cash-flow issues, poor site management, management issues with joint venture partners, insufficient equipment, etc., among the civil works contractors. These problems could be attributed to the lack of experience among the contractors. The supervision consultants have had similar problems relating to inexperience, resulting in poor road designs and inadequate supervision.

49. With the current boom in road construction, consultants tend to work on several projects at the same time and cannot deploy adequately skilled persons in time. During the project proposal stage, these consultants present their most experienced personnel to win the consultancy contract, but then replace them during implementation. Because of the general shortage of skilled manpower, both consultants and contractors find it difficult to field an adequate team.

50. The Government has encouraged joint ventures between international and domestic contractors for large packages to bring in better technology and at the same time build up the domestic contracting industry. But such joint ventures have not benefited the industry. Weak

²⁰ Mandatory Ministry of Environment and Forest questionnaires give more emphasis to collecting a wide range of background data. This requirement is not oriented to identifying and prioritizing the environmental issues arising from the project activities. Rarely are issues prioritized to lend focus as well as cost-effectiveness to the environmental assessment. The lack of adequate prioritization of environmental issues is seen in the unclear summary initial environmental examination for the NHDP II Project, which has potentially serious significant environmental impact. The lack of clarity relating to details of assessment regarding the type, magnitude, and location of possible adverse impact is apparent. In particular, the summary initial environmental examination consists of mostly generic statements on type of impact (e.g., noise, dust, construction wastes) and the mitigating methods but fails to highlight the specific key issues that may face each particular segment of the road subprojects or the issues relating to wildlife sanctuaries and the potential secondary impact of construction activity on the animals. In the case of the Madhya Pradesh State Roads Project, as with many other road projects, the main environmental impacts may occur offsite, depending on where and how the construction materials are excavated and wastes disposed of. Neither the summary initial environmental examination nor site interviews could provide answers to the questions on these issues.

joint ventures between the contracting partners have resulted in disputes leading to project delays as seen in the Western Transport Corridor project. There have been occasions when international contractors have lent their name to secure a particular contract, but most of the work was done by the domestic contractor. So most of the highway construction work is now being done by Indian firms, many of which did not exist 10 years ago and until recently had no specific roads highway experience.

C. Recommendations for Resolving Implementation Issues

51. Given below is a list of recommendations that ADB could adopt to resolve the above implementation issues. Although not exhaustive, this list suggests resolution of the key bottlenecks through a dialogue between ADB and the Government.

1. Project Preparation and Administration

52. To address project preparation and administration issues, ADB and the Government could:

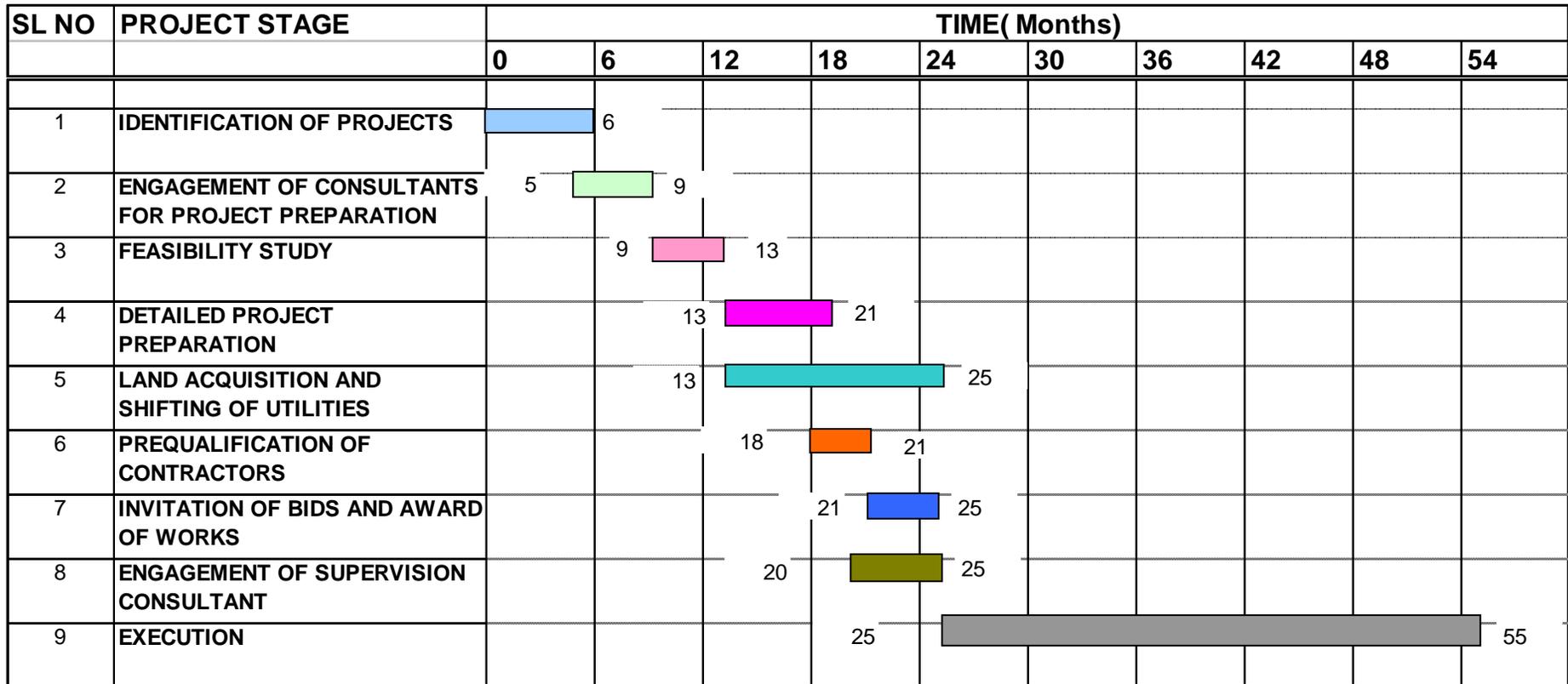
- (i) Establish project implementation units as a condition of Board presentation and ensure that these units are trained before procurement starts.
- (ii) Screen projects for readiness to avoid premature Board presentation.
- (iii) Improve quality at entry, i.e., address some of the issues identified in the evaluation.
- (iv) Make more frequent use of advance consultant recruitment and procurement action and retroactive financing.
- (v) Make more realistic implementation schedules, using more rigorous appraisal tools at project preparatory TA stage.
- (vi) Ensure adequate resources for project implementation in the transport sector in both the Transport and Communications Division of the South Asia Department and the India Resident Mission.
- (vii) Delegate approval powers to the India Resident Mission to hasten the approval of environmental and social safeguards.
- (viii) Harmonize ADB and World Bank procedures for implementing safeguards with the laws and guidelines of the central and state governments.
- (ix) Sustain and improve the current practice of country portfolio review missions to ensure dialogue with the Government of India in addressing systemic and project implementation issues.
- (x) Continue and improve the current practice of encouraging new executing agencies to learn from the experience of executing agencies from past projects. The Ministry of Finance and the Planning Commission could encourage an annual meeting of executing agencies and ADB staff could offer training related to consultant recruitment, procurement, disbursement, and project administration.

2. Contractors' Performance

53. To address contractors' issues, ADB and the Government could:

- (i) Draw on the findings of the recent World Bank study to develop a plan of action in conjunction with the Government that will help to build capacities within the contractors and consultants. For example, the encouragement given by the Government to joint ventures is a step in the right direction.
- (ii) Package contracts in sizes that will be easier for contractors to implement.

Figure A6.2: Typical Road Project Implementation Schedule



STRATEGIC POSITIONING IN THE TRANSPORT SECTOR

1. The Asian Development Bank's (ADB's) strategy in the last 3 years was focused on the following main components and related activities:

1. Physical Investments

2. Physical development was guided by the following considerations:

- (i) **Emphasis on existing infrastructure and facilities**, with priority placed on upgrading the capacity and efficiency of existing infrastructure, and limited new investments to supplement the existing network to realize new economic opportunities and enhance the overall efficiency of transport systems. While no new roads were built, existing roads were rehabilitated (as shown in Map 1).
- (ii) **Establishment of total connectivity** to provide rural communities with connections to urban centers, enable farmers to access more profitable markets and rural communities to participate in mainstream society, and provide better transport connections between urban centers to form a nationwide transport network.
- (iii) **Development of a modally balanced transport system**, by moderating the trend toward dependence on road-based transport in favor of a more sustainable transport mix integrating more environmentally friendly modes such as railways and inland waterways transport.
- (iv) **Contribution to reducing disparities between states**, by selectively expanding ADB's operations from its focal states (Chhattisgarh and Madhya Pradesh) to include other states, particularly northeastern states and other reform-oriented states, to help reduce regional income disparities.
- (v) **Contribution to subregional economic cooperation**, by supporting transport projects that would have positive impact on subregional trade.

2. Policy and Institutional Reforms

3. Policy and institutional reforms were provided in a progressive and evolving manner on the basis of agreed medium- and long-term goals, and with emphasis on national ownership of reform processes. Issues to be pursued through policy dialogue included:

- (i) **Separation of policy and operational functions** to establish separate responsibility for regulatory and operational functions of government transport agencies (e.g., Ministry of Shipping, Road Transport, and Highways, state public works departments, Ministry of Railways, and port authorities) to ensure clear accountability for the results of program implementation.
- (ii) **Sources of investment funding** required to upgrade transport systems, a central issue being the identification and securitization of necessary investment financing for the National Highway Development Program (NHDP), to develop the inland waterways transport system, and to increase internal revenue generation by operating railways commercially, rationalizing freight and passenger tariffs, discontinuing unprofitable activities, and establishing a public service obligation mechanism for the Government to meet the cost of any uneconomic services it wishes Indian Railways to provide for social reasons.
- (iii) **Operation and maintenance** systems to be established to ensure that newly created assets are appropriately maintained, and their right-of-way kept clear. For national highways, operation and maintenance activities are being progressively transferred to the private sector while, at the state level, the

maintenance activities traditionally carried out by public works departments need to be improved. For rural roads, ADB planned to help rural road authorities introduce sustainable maintenance mechanisms.

- (iv) **Increased private sector participation** to facilitate the shift in infrastructure development financing from the public sector to the private sector as the economy grows, by establishing a policy environment conducive to the expansion of infrastructure and services. Support was to be provided to facilitate the securitization of future revenue flows derived from toll road operations and, for state and rural roads, more engineering and civil works were to be contracted out. Private sector participation in the ports subsector was to be monitored closely to assess the need for improvements, while private sector participation prospects as part of Indian Railways reforms were to be considered, including private concessions for operating loss-making branch lines, competition in rail container services, and private sector provision of freight terminal services. Private sector participation in the inland waterways transport was to be encouraged by the identification of commercially viable projects as an essential first step forward.
- (v) **Transport safety**, aimed at addressing the significant increases in road traffic accidents as the network has improved, by means of studies into the introduction of highway patrols and emergency medical services, and the preparation of a dangerous-goods transport emergency plan. Community-level road safety initiatives were included with rural road improvements and ADB planned overall approaches to improving road safety in cooperation with other multilateral and bilateral aid agencies. For the railway subsector, accidents have also become an area of concern. Safety improvements, by replacing and upgrading depleted assets on congested routes, were to be included in ADB support for railways. For inland waterways transport, the incidence of traffic accidents is also believed to be high, but accident data are lacking, and most accidents are believed to involve passenger traffic. ADB plans to address these problems by providing support to strengthen inland waterways transport traffic accident data collection systems.

A. Maintaining System Balance and Meeting Capacity Requirements

4. The mobility and flexibility that roads offer, coupled with the substantial increase in the supply of road infrastructure in many parts of India, has led to a big change in the mode share in freight toward road and away from rail. Coastal shipping and pipelines have also become significant modes, primarily at the cost of the rail share. This has implications for road infrastructure investments, in terms of capacity and quality of roads, over and above access considerations. In the road subsector, because of the increases in motorized transport, larger cars, and vehicles with more features like air-conditioning, the energy intensity has been increasing. Conversely, the energy intensity in the rail subsector has been decreasing with the introduction of more efficient locomotives.

5. Largely as a result of growing export-import trade, containerized movement in India—using both rail and road transport services—is increasing. However, the supply side in terms of ports with appropriate services, hinterland connectivity, and infrastructure for domestic movements is significantly below the potential. The overall demographic and sociological forces in the country have also led to a larger fraction of the population moving to urban areas. This has resulted in a need for increased attention to the requirements of passengers and freight, apart from specific urban transportation needs, including an efficient interface between inter- and intra-urban transport systems.

6. Rather than infrastructure provisioning by the public sector being taken for granted, it has now come to be accepted that the user should pay for the use of good-quality infrastructure. This has enabled a commercial orientation to infrastructure development in India, either entirely by government or through public-private partnerships. While the former has implications for financing and pricing, the latter also has the advantage of leveraging private entrepreneurship.

7. Over the past 20 years, ADB and other financing agencies, mainly the World Bank and Japan Bank for International Cooperation, have supported many projects to address the mismatches between demand for and supply of transport services in India. Most ADB projects (primarily involving capacity constraints on India's roads, rail, and ports systems) have been successfully accomplished. To date, India has been able to channel sufficient funding from government budgetary support (from fuel cess and toll collections), the private sector (through private sector participation), or external agencies to finance NHDP I and II. For all later phases of the NHDP, the Government envisages all roadworks to be primarily on a build-operate-transfer basis with government budgetary support only where there is a viability gap; i.e., for those road sections not considered economically viable and where private sector interest is not forthcoming. The evaluation team noted also that several national highway sections in some states (notably Bihar, Mizoram, Nagaland, and Assam) have been released by the National Highways Authority of India (NHAI) for upgrading on a build-operate-transfer basis under the NHDP, but have met with little response from bidders because of security issues in these locations. For non-NHDP highways and the *Pradhan Mantri Gram Sadak Yojana* program for rural roads, the Government intends to provide finance from its own revenue sources.

8. In line with the overarching development goals, the development partners including ADB have been considering support for those transport projects that are socially and developmentally desirable yet financially unviable and for which there are gaps in funding. This would appear to suggest a more selective approach to national highway and state highway improvements, with more focus given to the development of all-weather rural roads and other transport projects (e.g., capital dredging to deepen port access channels, infrastructure improvements to catalyze waterways development) having little appeal for private investors, but potentially advantageous in achieving overall system balance or social objectives.

9. In the port subsector, ADB's assistance ceased in the late 1990s, by which time the private sector was actively engaged in several of India's major ports and ADB had made a positive contribution to this development. However, there are now signs that the ports are under increasing pressure as a result of India's growing economy and trade. Some aspects of the ports (e.g., insufficient draft to permit large vessels to use the major ports) require attention but there is limited interest from private investors. With both the national highway and rail networks being connected to the major ports as part of the NHDP and National Rail Vikas Yojana programs, and with dedicated rail freight corridors being developed for container services to and from the major ports, the evaluation team noted that the Ministry of Shipping, Road Transport, and Highways has an interest in ADB reassessing its earlier decision to withdraw from the port subsector.

B. Strategic Positioning

1. National Highways

10. The common objectives of ADB's lending program for national highways are to help remove capacity constraints, enhance road safety, promote public-private partnership, and increase the managerial capabilities of NHAI and provincial executing agencies. While these

objectives in themselves are significant, the effectiveness of lending programs could be reduced by the multiplicity of objectives.

11. A positive aspect of the projects' scope for lending is that a "corridor" approach has been taken. In fact, as the transition is made from engineering, procurement, construction contracts to a BOT framework, longer segments would naturally be in order.

12. Safety needs to be given high priority, since the removal of capacity constraints has in principle been accepted, through a four-lane construction program. Improved safety requires focusing on engineering design and on roadside furniture and signs, and quick recovery in case of accidents. With the improvement in the quality of roads, India is moving into a category of higher vehicular speeds that needs to be balanced by a corresponding improvement in road safety. Independent programs and projects that focus on vehicular and driver (licensing) aspects of safety should be considered.

13. Independent programs for the managerial capacity enhancement of NHAI and state public works departments need a strong focus. NHAI suffers from not having its own cadre since it is staffed largely on deputation, and without necessarily having a commercial focus. On the other hand, state Public Works Department engineers may be more inward looking, without a significant commercial perspective.

14. Making the state public works departments separate companies to compete at the national level would energize them. NHAI and public works departments need greater focus (and fundamental capabilities) on the environment, land acquisition, resettlement and rehabilitation, legal issues, and concession management.

15. Capacity building in the private sector (contractors and consultants) and the road equipment manufacturing sector are high priorities.

2. State Highways

16. The primary focus in state highways subsector should be on (i) maintenance for state roads, and (ii) all-weather connectivity and maintenance for rural roads. Outsourcing maintenance to private players should be the objective. Local community oversight should be leveraged in the case of rural roads, both for project selection and for maintenance.

3. Railways

17. New corridors focused on better connectivity (missing links) would be a priority. Enhancement of capacity in bottleneck corridors through soft investments (signaling and information technology) would be the next.

18. ADB's earlier support in setting up the Rail Vikas Nigam Limited was a step in the right direction for the creation of an appropriate institutional framework and institution for catalyzing key rail projects. Issues may remain in the selection of joint venture partners, equity share holding, management control, revenue and cost sharing, guarantees, etc.

4. Technical Assistance

19. Capacity building to support the transition to commercially autonomous institutional frameworks should be the priority in the context of NHAI, state public works departments, railways, and ports.

20. Reform programs are a good approach, though they sometimes lack clarity and specificity (e.g., in the case of the technical assistance for the Indian Railways). However, there may have to be a balance between over determining a reform and providing space for the organization to discover its own direction, especially during transitional phases.

ASSESSMENT OF TECHNICAL ASSISTANCE

A. Basis of Assessment

1. Among the multilateral and bilateral development agencies, the Asian Development Bank (ADB) is the largest provider of technical assistance (TA) to India's transport sector. Between 1987 and 2005, ADB has provided 19 advisory TA projects. Of these, 15 have been completed (closed), with majority (11) of these having been approved before 1995. In other words, most of the TA projects were completed a long time back. This has implications for the availability of information and evidence for assessing the success of this assistance. Owing to the lack of adequate information, the evaluation team has had to rely on TA completion reports, which have been validated on the basis of general impacts seen in the sector. Ongoing TA projects have been evaluated on the basis of discussions with current officials of the executing agencies with limited institutional memory. Moreover, with the ongoing TA projects, the outcomes can be seen only after they are completed. The assessment herein is an indication of the likely success of these TA projects.

2. The advisory TA projects can be clustered into five groups: (i) systems planning, (ii) institutional capacity building, (iii) private sector participation, (iv) policy development, and (v) safety. These are the basic themes targeted by the ADB TA. These TA projects have usually been approved as part of a loan project, although the implementation has been separate in terms of procurement of consultants and generation of outputs. Table A8.1 provides an assessment for each TA.

Table A8.1: Assessment of Technical Assistance

TA Ref. No.	Title	Year	Assessment	Relevance (scale of 0-3)	Efficiency (scale of 0-3)	Efficacy (scale of 0-6)	Sustainability (scale of 0-6)	Impact (scale of 0-6)	Overall Rating
Transport Systems Planning									
ROADS									
1058	Pavement Management	1989	Unsuccessful	3	2	2	2	2	11
1059	Expressway System Planning	1989	Less Successful	3	2	2	2	2	11
1402	Pavement Management for National Highways	1990	Unsuccessful	3	2	2	2	2	11
4697	Development of road agencies in North Eastern States	2005	Likely to be successful	3	3	4	4	4	18
RAILWAYS									
1620	Enhancement of Operational Efficiency on Indian Railways	1991	Highly successful	3	3	6	4	4	20
1621	Rationalization of Non-Bulk General Cargo Traffic	1991	Highly successful	3	3	6	4	4	20
1622	Improvement of Traffic Costing and Financial Management Reporting of Indian Railways	1991	Less successful	3	2	2	2	2	11
Institutional Capacity Building									
ROADS									
1404	Road Construction Industry	1990	Successful	3	2	3	4	4	16
2002	Environmental Management of Road Projects	1993	Successful	3	3	4	4	5	19
2003	Technical Standards of Highway Concrete Structures	1993	Less Successful	3	2	2	2	2	11
3361	Capacity Building for Contract Supervision and Management in National Highways Authority of India	1999	Highly successful	3	3	4	4	4	18
3724	Enhancing the Corporate Finance Capability of National Highways Authority of India	2001	Likely to be successful	3	2	4	4	4	17
4013	Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector	2002	Successful	3	2	4	4	4	17
Private Sector Participation									
ROADS									
1403	Private Sector Participation in Expressway Financing, Construction, and Operation	1990	Highly successful	3	3	4	4	4	18
3445	Establishing a Public-Private Joint Venture for the West Bengal North-South Economic Corridor Development	2000	Successful	3	2	3	3	3	14
4271	Development of High Density Corridors under the Public-Private Partnership	2003	Likely to be less successful	2	2	2	3	3	12
Policy Development									
RAILWAYS									
2721	Railway Sector Improvement	1996	Successful	3	2	4	3	4	16
4053	Management Consulting Services to Indian Railways	2002	Likely to be less successful	3	2	2	3	3	13
Safety									
ROADS									
2001	Road Safety	2003	Less successful	3	2	2	2	2	11

TA = technical assistance.

Source: Operations Evaluation Mission.

1. Technical Assistance Projects Related to Transport Systems Planning

3. This group comprised seven TA projects, four in the roads subsector and three in the railways subsector. In all cases, the general aim has been to introduce new systems to improve management capabilities, operational efficiencies, and capacity.

4. TA 1058¹ was designed to provide assistance in preparing a pavement management system in Andhra Pradesh and Tamil Nadu. The TA completion report noted that decisions for maintaining roads in both states continued to be made on standard norms, with no institutionalization or ownership of pavement management system. As a result, the results of the TA were not incorporated into the operations of the road agencies, reducing the effectiveness of the TA. Moreover, since the TA did not have any follow-up actions, it lacked sustainability. Overall, the TA has been unsuccessful.

5. TA 1059² was designed to provide assistance to the Ministry of Surface Transport in establishing a system to aid decision making in improving national highway traffic corridors, including the means to assess the financial viability of options. The TA completion report noted that the TA outcome was a “study” rather than a “system,” which examined the means of verifying the need for controlled-access facilities, grade-separated interchanges, and private sector participation. There is not enough information about this TA. However, since the development of expressways made little progress in later years, this study has been less useful to the Ministry of Surface Transport and the National Highways Authority of India (NHAI). In addition, the private sector participation mechanisms now being developed are a result of the later TA projects. Overall, the TA is rated less successful.

6. TA 1402³ was aimed at developing a pavement management system for national highways. Assistance was provided to the Ministry of Surface Transport in developing a computer-based pavement management system for national highways, and to Karnataka and Uttar Pradesh in implementing the system on a pilot basis, supported by staff training by the Ministry of Surface Transport and the Public Works Department (PWD). The TA completion report rated the TA unsuccessful as a result of a lack of ownership or involvement of the Ministry of Surface Transport and the PWDs in Karnataka and Uttar Pradesh. No pavement management system was installed or in use. This lack of uptake indicates the need to update road maintenance practices and standards, and to undertake an institutional development study to make a “pavement management system approach” effective at the Ministry of Surface Transport and in the PWDs. Overall, the TA is rated unsuccessful.

7. TA 4697⁴ will provide assistance to facilitate the long-term preservation of road assets in the northeastern states. The TA will develop the capacity of the northeastern states’ PWDs through (i) computer-based road asset management tools; and (ii) the use of state-of-the-art project management techniques, thereby improving the quality of the roads and increasing the

¹ ADB. 1989. *Technical Assistance to India for the Pavement Management System*. Manila (TA 1058-IND, for \$490,000, approved on 3 January).

² ADB. 1989. *Technical Assistance to India for the Expressway System Planning*. Manila (TA 1059-IND, for \$260,000, approved on 3 January).

³ ADB. 1990. *Technical Assistance to India for the Pavement Management for National Highways*. Manila (TA 1402-IND, for \$760,000, approved on 30 October).

⁴ ADB. 2005. *Technical Assistance to India for Development of Road Agencies in the North Eastern States*. Manila (TA 4697-IND, for \$900,000, approved on 23 November).

productivity of labor and capital during and after the ensuing loan project is implemented. This TA is likely to be successful.

8. For the railway subsector, TA 1620⁵ was a three-part TA to improve existing systems: (i) to develop a computer-aided design for a maintenance-free overhead electrical system, (ii) to identify mitigating factors causing capacity constraints in two major railway corridors, and (iii) to examine ways and means to conserve energy in lubricating oils for locomotives. The 2000 loan project completion report reported that the TA was implemented as envisaged at appraisal and that its recommendations were largely implemented. Overhead electrical systems development was assisted by improvements in resources available for training, the establishment of training standards, the adoption of new equipment for measuring the running performance, and the introduction of more eight-wheeler tower wagons for efficient damage recovery. Capacity constraints were identified and addressed using mechanized track maintenance on a wider basis, and improved train planning procedures, enforcement of maintenance standards, and quality and inspection procedures for maintenance and repair work. Energy conservation was achieved using alternatives to lubricating oil in the context of overall operating budget and policy, and by developing a fuel efficiency kit to be fitted to locomotives. Overall, this TA is rated highly successful.

9. TA 1621⁶ assisted with the handling of non-bulk freight traffic on the railway. The project completion report for Loan 1140 reported that the Indian Railways incorporated several of the recommendations from this TA into its operations. The Indian Railways (i) replaced the speed link and other similar services with mechanized trains by adding suitable vans, ventilated wagons, etc., in phases; (ii) privatized parcel services to introduce competition; and (iii) closed parcel and perishable station sheds after 2 years of unprofitable operation. The Indian Railways continued to implement other recommendations from the TA gradually. Overall, this TA is rated highly successful.

10. TA 1622⁷ provided assistance to the Indian Railways in traffic costing and financial management systems. The project completion report for Loan 1140 reported that the Indian Railways had not implemented the TA recommendations. The TA recommended activity-based costing and a revised format for financial reporting. The Indian Railways stated that the recommended system was not practical for Indian Railways to implement. In 1996, however, Indian Railways developed the activity-based unit costing system by itself to transform the operating divisions of Indian Railways into centers of financial performance. Since then, through policy dialogue for the ensuing (2002) ADB project, Indian Railways has agreed to implement the new costing system on a pilot basis. This TA is found to be less successful. However, the evaluation team noted that the Indian Railways has recently resumed efforts to improve its accounting system as part of the reform agenda agreed on with ADB.

B. Technical Assistance Projects for Institutional Capacity Building

11. This group comprised six TA projects in the road subsector. In all cases, the aim of the TA was to provide the means to strengthen the nodal transport authority.

⁵ ADB. 1991. *Technical Assistance to India for Enhancement of Operational Efficiency on Indian Railways*. Manila (TA 1620-IND, for \$1.05 million, approved on 5 December).

⁶ ADB. 1991. *Technical Assistance to India for the Rationalization of Nonbulk General Cargo Traffic*. Manila (TA-1621-IND, for \$560,000, approved on 5 December).

⁷ ADB. 1991. *Technical Assistance to India for Improvement of Traffic Costing and Financial Management Reporting of Indian Railways*. Manila (TA 1622-IND, for \$325,000, approved on 5 December).

12. TA 1404⁸ was aimed at a comprehensive study of the road construction industry, including analysis of the institutional and business environment, and recommendations to address current impediments, stimulate growth, increase competence, and raise the professional standing of the industry. The rationale behind the TA was to identify the causes of deteriorating quality of works, time and cost overruns in projects, and the inability of the industry to cope with road projects under the 8th Five-Year Plan. The 2000 TA completion report rated the TA generally successful. The TA identified weaknesses caused by the lack of exposure of the local industry to international practices, the need for training (all levels), and the need to streamline administrative and procedural policies. The TA completion report reported that the results of the TA were being used by the Ministry of Surface Transport and ADB including a recommendation in Loan 1274 to increase the exposure of the local construction industry to international practices. The TA completion report recommended that ADB continue a policy dialogue with the Ministry of Surface Transport/NHAI on ways to boost the Indian road construction industry, although it remains to be seen whether this issue can be resolved through policy interventions or through the gradual maturity of the industry. Overall, this TA is rated successful.

13. The National Highways Project (Loan 1274)⁹ included two TA projects in institutional capacity building: (i) TA 2002,¹⁰ which developed environmental standards for road projects; and (ii) TA 2003,¹¹ which was aimed at developing and implementing improved standards for concrete structures. TA 2002 was focused on strengthening the Ministry of Surface Transport and PWDs to enable them to carry out environmental assessments of road projects and to ensure that road projects complied with the regulations of ADB and the Government of India. The TA was to prepare environmental guidelines for roads in India, provide training to the Ministry of Surface Transport/PWD staff in environmental impact assessments and environmental management of road projects, and prepare manuals on the guidelines for contractors. A 1999 Operations Evaluation Department (OED) evaluation of the TA projects after completion determined that TA 2002 had a “quite high” impact on the environmental standards being adopted in India for road works. Overall, TA 2002 is rated successful.

14. TA 2003 was aimed at developing, obtaining approval for, and implementing better standards for concrete structures. The 1999 OED evaluation found that the Ministry of Surface Transport and the Indian Roads Congress were “not very proactive” in promoting the recommendations for improved standards for concrete structures. Overall, this TA is rated less successful.

15. TA 3361¹² was aimed at increasing the efficiency of implementing civil works contracts on major road projects by (i) improving NHAI contract supervision and management in line with internationally applied procedures, (ii) enhancing the responsibilities and accountability of an independent engineer, (iii) promoting a change in attitude to allow for a fair partnership, (iv) incorporating lessons learned into pre-contract and contract management activities, and

⁸ ADB. 1990. *Technical Assistance to India for Road Construction Industry*. Manila (TA 1404-IND, for \$340,000, approved on 30 October).

⁹ ADB. 1993. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to India for the National Highways Project*. Manila (Loan 1274-IND, for \$245 million, approved on 29 November).

¹⁰ ADB. 1993. *Technical Assistance to India for Environmental Management of Road Projects*. Manila (TA 2002-IND, for \$240,000, approved on 29 November).

¹¹ ADB. 1993. *Technical Assistance to India for Technical Standards of Highway Concrete Structures*. Manila (TA 2003-IND, for \$350,000, approved on 29 November).

¹² ADB. 1999. *Technical Assistance to India for Capacity Building for Contract Supervision and Management in the National Highways Authority of India*. Manila (TA 3361-IND, for \$600,000, approved on 22 December).

(v) enhancing NHAI capacities in contract management. The 2003 TA completion report rated the TA successful and noted that it had dealt with the serious issues in contract management in NHAI and had achieved all the TA objectives, and identified further actions to be taken by the Government and NHAI. Furthermore, the TA served to improve NHAI capacity in contract management. Project implementation substantially improved and, as a result, ADB has provided three highway projects to India since 2000 with NHAI as the executing agency.

16. The TA enabled eight courses of training in contract management for NHAI staff, contractors, and local consultants over 15 days, focused on improving understanding of the International Federation of Consulting Engineers (Fédération Internationale des Ingénieurs Conseils) procedures. Although there was a general appreciation of the content of these courses, the length of this training appears to be short. In addition, this training needs to be done more regularly to cover more staff members. The design of such training courses needs to be discussed with NHAI during TA fact-finding, especially since NHAI needs to be sufficiently equipped to ensure continuity of this training and use of the content. Although the capability of NHAI has improved, its performance needs to be monitored and training continued. Overall, the TA 3361 is rated highly successful.

17. As part of Loan 1944,¹³ the ongoing TA 3724¹⁴ has a range of capacity-building objectives under two modules. Draft final reports on Module I (1, 2, and 3) and Module II (3) were submitted in May 2006. The objectives of the TA are as follows:

- (i) Module I: Capacity Building for fund mobilization and financial management
 - (a) Support for fund mobilization;
 - (b) Support for improvements in the treasury function; and
 - (c) Support for improvements in the financial reporting system.
- (ii) Module II: Enhancement of NHAI's capability to handle emerging social and operational issues
 - (a) Monitoring of relocation and resettlement activities and grievance handling;
 - (b) Road safety module; and
 - (c) Integrated operation and maintenance scheme.

18. There has been a major improvement in NHAI's capability to mobilize private sector funding for small, as well as large projects. In parallel, NHAI's capacity to handle environmental and social issues has improved, although it still has a long way to go. Overall, the TA's objectives are likely to be achieved. The TA is rated likely to be successful.

19. The ongoing TA 4013 and its supplementary TA¹⁵ are aimed at providing assistance in establishing a state-owned corporation in Madhya Pradesh to manage the state highway network. While this has been generally achieved, one of the components—reducing PWD staff—was not achieved. However, this component is seen to be impractical given the wider impact of reducing staff, which requires more time and effort. The supplementary TA was intended to assist with strengthening the Madhya Pradesh PWD in the management of Madhya

¹³ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the East-West Corridor Project*. Manila (Loan 1944-IND, for \$320 million, approved on 26 November).

¹⁴ ADB. 2001. *Technical Assistance to India for Enhancing the Corporate Finance Capability of NHAI*. Manila (TA 3724-IND, for \$700,000, approved on 20 September).

¹⁵ ADB. 2002. *Technical Assistance to India for Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector*. Manila (TA 4013-IND, for \$1.5 million, approved on 5 December); and ADB. 2005. *Technical Assistance to India for Institutional Strengthening and Capacity Building for Madhya Pradesh State Road Sector (Supplementary)*. Manila (TA 4013-IND, for \$600,000, approved on 29 April).

Pradesh's remaining road network. Substantial progress has been made in setting up institutional arrangements and developing systems for the implementation of the road improvement program under ADB Loan 1959¹⁶ to improve the state highways network. While the newly set up Madhya Pradesh State Road Development Corporation is perceived to be well resourced and capable of managing the state highways network with private sector assistance, the PWD continues to lag behind in terms of capacity and systems. Overall, the TA has been successful, but on the lower side.

C. Technical Assistance Grants Related to Private Sector Participation

20. This group comprised three TA projects—two involving private sector participation development for the national highways, and one for a multimodal corridor. In all cases, the aim of the TA projects was to provide the enabling environment to encourage private sector participation.

21. TA 1403 was aimed at establishing the feasibility of promoting private sector participation in financing, constructing and operating expressways, and assisting the Ministry of Surface Transport in developing policies to attract private sector investments. The TA completion report rated the TA generally successful, as it provided a model for increased awareness in the Ministry of Surface Transport of build-operate-transfer arrangements, including parameters to attract private sector interest. The TA recommendations were used in developing the Government's Guidelines for Private Investment in national highways. The TA also identified the need to set up an apex body to manage expressway development (i.e., NHAI), and this recommendation was subsequently implemented. Overall, this TA is rated highly successful.

22. TA 3445¹⁷ provided assistance to the government of West Bengal in multimodal corridor development. Its aim was to establish the institutional prerequisites for building a relationship based on trust between the public and private sectors for the overall purpose of developing the economic corridor. This was necessary to ensure that sufficient high-level project management skills would be in place from 2000 onward to oversee and expedite all aspects of the investment implementation process. However, little information is available on the uptake of this TA. Overall, the TA is rated successful.

23. An ongoing TA 4271¹⁸ is aimed at facilitating the implementation of the High Density Corridor Program by (i) establishing institutional arrangements necessary for project management and financing mechanisms, and (ii) elaborating the concept of the entire program to provide an overall plan for its implementation. The TA has five components:

- (i) Institutional arrangements;
- (ii) Traffic projection and prioritization;
- (iii) Public-private partnership investment schemes;
- (iv) Program design; and
- (v) Social safeguards.

¹⁶ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Madhya Pradesh State Roads Sector Development Program (Project) Loan*. Manila (Loan 1959-IND).

¹⁷ ADB. 2000. *Technical Assistance to India for Establishing a Public-Private Joint Venture for the West Bengal North-South Economic Corridor Development*. Manila (TA 3445-IND, for \$150,000, approved on 25 May).

¹⁸ ADB. 2003. *Technical Assistance to India for the Development of High Density Corridors under the Public-Private Partnership*. Manila (TA 4271-IND, for \$700,000, approved on 18 December).

24. This TA appears to cover many areas and lacks focus. While the NHAI has been progressing well on these fronts, it is difficult to attribute the progress to a broad TA program. The evaluation team did not find specific evidence linking this TA with the general progress being made by NHAI. Overall, this TA is likely to be less successful.

D. Technical Assistance Grants Related to Policy Development

25. This group comprised two TA projects for the railway subsector. In both cases, the aim of the TA projects was to provide assistance with policies and policy reforms to improve the management of the railway subsector.

26. TA 2721¹⁹ provided assistance to the Government in formulating a program for improving the efficiency and performance of the railway subsector. The TA defined key policy actions and investment components that were considered critical for the sustainable improvement of Indian Railways' efficiency, capacity, safety, and competitiveness. The TA drew attention to the need to restore Indian Railways' financial sustainability, and proposed options for improvement, including increasing Indian Railways' commercial orientation, reducing costs, strengthening governance, rationalizing tariffs, promoting private sector participation, strengthening financial systems, and providing training. No TA completion report was prepared. This TA led to Loan 1981, which contains a broad reform agenda for Indian Railways as well as a capital investment component. Overall, the TA is rated successful.

27. The ongoing TA 4053²⁰ is aimed at improving the performance of the railway sector by supporting (i) the implementation of a program of institutional and policy reforms to improve the Indian Railways' commercial orientation, and (ii) the expansion of core businesses by financing priority investments to overcome railway capacity bottlenecks and improve operational efficiency and safety. The project is also intended to contribute to organizational efficiency by promoting outsourcing, award of concessions, and use of consolidated contracts for the execution of railway investment projects. This TA has been less than successful so far, however, owing to its limited scope of monitoring the progress of the reforms. Since the reform agenda is rather broad, there is little scope for the TA to add value in identifying specific tasks to implement the reforms. In addition, since the TA is basically managed by ex-Indian Railways officers, its effectiveness is reduced by a direct conflict of interest. Although the TA is likely to adequately monitor the progress of reforms, it remains to be seen how it will add value to the reform process. Overall, the TA is likely to be less successful.

E. Technical Assistance Projects Related to Safety

28. This group comprised just one TA for roads and highways. The aim of the TA was to provide assistance with some aspects of the industry that had an overall effect on the specific subsector.

29. The National Highways Project (Loan 1274) included TA 2001,²¹ which was aimed at assisting the Government in improving the knowledge, capability, and training of personnel (particularly the Ministry of Surface Transport and relevant state agencies) in accident analysis,

¹⁹ ADB. 1996. *Technical Assistance to India for Railway Sector Improvement*. Manila (TA 2721-IND, for \$800,000, approved on 19 December).

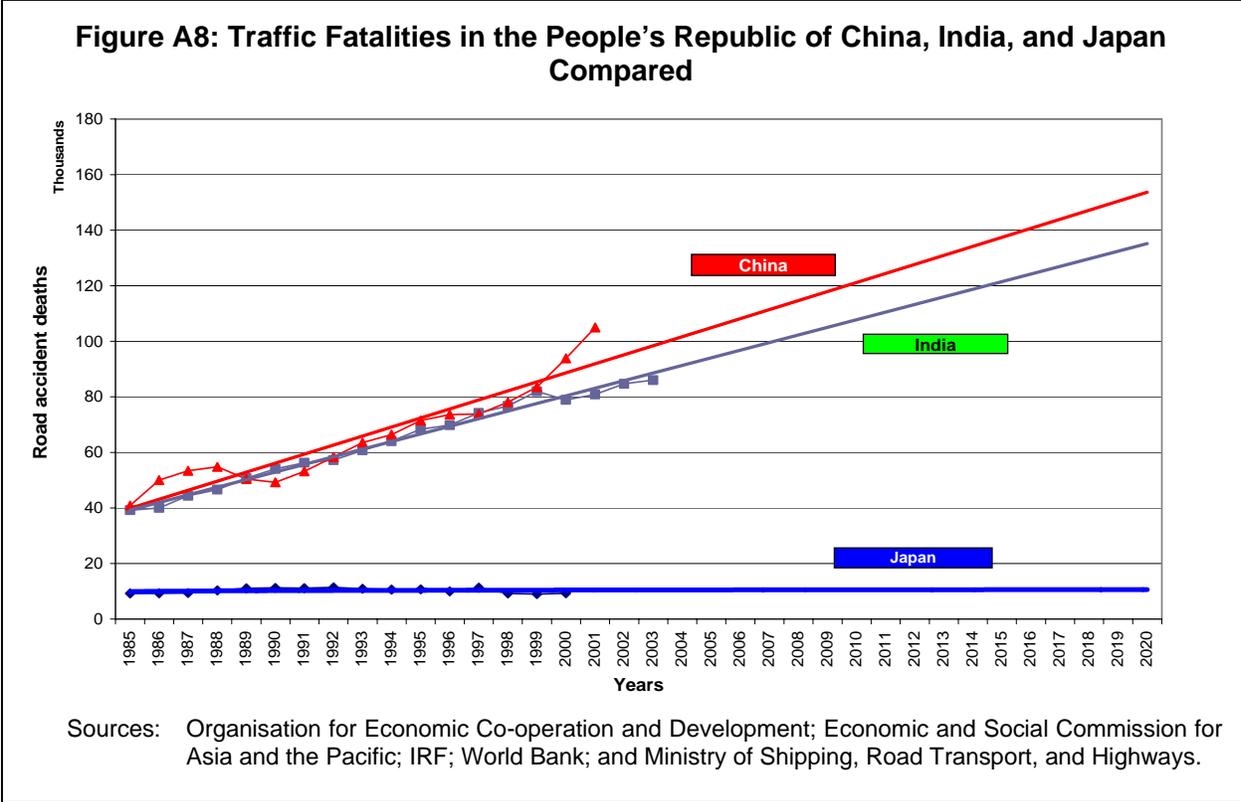
²⁰ ADB. 2002. *Technical Assistance to India for Management Consulting Services to Indian Railways*. Manila (TA 4053-IND, for \$500,000, approved on 19 December).

²¹ ADB. 1993. *Technical Assistance to India for Road Safety*. Manila (TA 2001-IND, for \$210,000, approved on 29 November).

traffic engineering, and the design of low-cost road accident countermeasures. An ADB project performance audit report evaluated this TA in conjunction with other ADB TA projects in road safety (in the People's Republic of China, Philippines, etc.), and the evaluation team noted that it was "relevant to immediate/short-term priorities," but also that the international consultants could have been more effective in disseminating ADB's *Guidelines for Road Safety*, besides giving workshops on these. The evaluation team also noted the insufficiency of the 8 person-months for international consultants in the TA. One case study (Karnataka) was undertaken, but the results were not disseminated. Institutional capacity building had limited impact, and only for the Karnataka police, who achieved an accident database for NH4 and NH7. However, because of time and resource constraints, other TA objectives were not fully achieved, as the TA was not successful in assisting domestic consultants in identifying road black-spots. A highway safety manual was prepared and distributed, but with little impact, since the safety of the national highways has not improved. The evaluation team noted that TA 2001 had minimal impact on the subsequent Loan 1274, although it made a number of specific recommendations for follow-up, on which the rating of Loan 1274 was to be contingent. ADB review missions during the implementation of the TA reported that the TA could not successfully achieve all its objectives since NHAI was not proactive in implementing its recommendations. Overall, the road safety TA is rated less successful.

30. Road safety is a major problem and needs to be better supported. Since this TA, ADB has included a road safety element in most of its road and highway projects. These efforts have focused on some aspects of the "engineering" and "education" components of a road safety program at the project level (e.g., road safety audits, traffic safety awareness campaigns) on NHAI and state road projects. None had a positive and lasting effect in addressing India's road safety problems. In its operations in the India road sector, ADB has not made sufficient use of the Road Safety Guidelines for the Asian and Pacific Region that were the output of an ADB regional technical assistance in 1998.²² The guidelines cover 14 factors affecting road safety and all have relevance to India. With the Ministry of Shipping, Road Transport, and Highways establishing a central Road Safety Directorate and allocating funding for road safety, there may now be an opportunity for ADB to provide TA at a central level to develop a sustainable national road safety program. The importance of including specific road safety activities in future TA projects and loans is highlighted by the forecast given in Figure A8 below, which compares estimated future trends for traffic fatalities in India and the People's Republic of China with those in Japan. This suggests that almost 140,000 persons a year may die on India's roads by 2020 unless steps are taken to stop the present trend. Japan is able to keep its traffic deaths consistently below 10,000 per year.

²² ADB. 1995. *Technical Assistance for Regional Initiatives in Road Safety*. Manila (TA 5620-REG, for \$600,000, approved on 4 January).



31. The regulations and standards for both drivers and vehicles using India’s roads need to be improved. Although a number of regulations exist, a common problem is their enforcement, including corruption that undermines enforcement. Future TA projects could explore the possibility of streamlining the level and procedures for driver training, testing, and licensing, particularly for commercial operators of trucks and passenger services. Similarly, standards for motor vehicles could be included for updating to cover both mechanical and emissions testing with a review of the testing procedures and frequency combined with a particular focus on improving the roadworthiness of commercial vehicles (trucks and passenger vehicles). The TA could also include the development of a strategy to encourage multi-axle heavy trucks and of a mechanism to introduce a formal vehicle scrapping process, including the systematic removal of the vehicle’s registration from official records. Advice would also be provided to help reduce the amount of corruption involved in regulation, licensing, and registration.

EVALUATION MATRIX

1. Table A9.1 provides a rating for each project, completed as well as ongoing. On a relative basis, the road subsector projects are likely to be more successful than those in the railway subsector. This is in line with the general trend in other countries.

Table A9.1: Project Ratings

No.	Project	Amount (\$ million)	Approval	Status	Relevance (scale of 0–3)	Likely Effectiveness (scale of 0–6)	Likely Efficiency (scale of 0–3)	Likely Sustainability (scale of 0–6)	Likely Impact (scale of 0–6)	Overall Rating
A. Roads										
918	Road Improvement	198	1988	Completed	3.0	4.0	2.0	3.0	3.0	15.0
1041	Second Road	250	1990	Completed	3.0	4.0	2.0	3.0	3.0	15.0
1274	National Highways	245	1993	Completed	2.0	4.0	2.0	2.0	4.0	14.0
1747	Surat-Manor Tollway	180	2000	Completed	2.0	4.0	1.5	2.0	4.0	13.5
1870	West Bengal Corridor	210	2001	Ongoing	2.0	4.0	1.0	2.0	2.0	11.0
1839	Western Transport Corridor	240	2001	Ongoing	2.0	4.0	1.0	2.0	2.0	11.0
1944	East-West Corridor	320	2002	Ongoing	2.0	4.0	1.0	2.0	2.0	11.0
1958	Madhya Pradesh State Roads	30	2002	Ongoing	2.0	4.0	1.5	4.0	3.0	14.5
1959	Madhya Pradesh State Roads	150	2002	Ongoing	2.0	4.0	1.0	4.0	2.0	13.0
2018	Rural Roads Sector I	400	2003	Ongoing	3.0	4.0	1.0	2.0	4.0	14.0
2050	Chattisgarh State Roads	180	2003	Ongoing	2.0	4.0	1.0	3.0	2.0	12.0
2029	National Highway Corridor (Sector)	400	2003	Ongoing	2.0	4.0	1.0	2.0	2.0	11.0
2154	National Highway Sector II	400	2004	Ongoing	2.0	4.0	1.0	2.0	2.0	11.0
Subtotal A		3,203			2.3	4.0	1.3	2.3	2.7	12.4
B. Railways										
857	Railways	190	1987	Completed	2.0	4.0	1.5	4.0	2.0	13.5
1140	Second Railways	225	1991	Completed	2.0	4.0	1.5	4.0	2.0	13.5
1981	Railway Sector Improvement	313	2002	Ongoing	2.0	1.0	1.0	2.0	2.0	8.0
Subtotal B		728			2.0	2.7	1.3	3.1	2.0	11.1
Total (A + B)		3,931			2.2	3.7	1.3	2.4	2.5	12.2

Source: Operations Evaluation Mission.

2. Table A9.2 provides an aggregate rating for the subsectors, differentiating between the various segments in the road and highway subsector. Within this subsector, the state highways and rural roads projects are likely to be more successful because of relatively better efficiency, sustainability, and impact. Overall, the bottom-up rating is partly successful.¹

Table A9.2: Bottom-Up Ratings

Subsector	Segment	Aggregate Loan Amount (\$ million)	Weightage (% of total)	Relevance (scale of 0–3)	Likely Effectiveness (scale of 0–6)	Likely Efficiency (scale of 0–3)	Likely Sustainability (scale of 0–6)	Likely Impact (scale of 0–6)	Overall Rating	Description
Roads and Highways	National Highways	1,785	45	2	4	1	2	2	12	Partly successful
	State Highways	1,018	26	2	4	1	3	2	13	Partly successful
	Rural Roads	400	10	3	4	1	2	4	14	Partly successful
Railways		728	19	2	3	1	3	2	11	Partly successful
Overall Projects Ratings		3,931	67	2	4	1	2	3	12	Partly successful
TA Rating			33	3	3	2	3	3	15	Partly successful
Total				2	4	2	3	3	13	Partly successful

TA = technical assistance.

Source: Operations Evaluation Mission.

¹ Sector performance is assessed as follows: highly successful, a score of at least 20; successful, 16–19; partly successful, 11–15; and unsuccessful, 10 or less.

3. Chapters III and VI of the main report substantiate the rating for relevance of both completed and ongoing projects. Chapter V of the main report and the subsequent section of this appendix discuss the efficiency of the completed projects; chapter IV of the main report and Appendix 6, the implementation efficiency of the ongoing projects. Chapter V discusses the efficacy of all the projects. Chapter V and Appendix 11 discuss the sustainability of the projects, and chapter V and Appendix 12, the likely impacts of the Asian Development Bank (ADB) projects.

4. Four projects in the road and highway subsector and two projects in the railway subsector are complete. The efficiency of these projects is evaluated below.

1. Road and Highway Subsector

5. **Loan 918.** Although the quality of work was satisfactory, project completion was delayed by more than 4 years. The cost of original design was substantially underestimated and the contract values exceeded the appraisal estimates by 69%. This lowered the project economic internal rate of return (EIRR) at completion compared with the appraisal estimate. A postevaluation conducted in 2002 resulted in a still lower but acceptable EIRR of 20.7%.² The lower EIRR also reflected the overall optimistic forecast made at appraisal. Also during postevaluation, the income elasticity of demand was reduced to reflect the actual situation. Project implementation was less satisfactory because of the poor delegation of responsibilities to the advisory consultants and the lack of familiarity of the executing agencies with the Federation of Consulting Engineers contracts. This created conflicts between the executing agencies and the consultants. To add to the problems, the project included a realignment that led to an environmental controversy in Tamil Nadu,³ causing a temporary suspension in construction activities. However, despite these implementation issues, the EIRR at completion was higher than the benchmark 12%. Hence, the project is rated efficient.

6. **Loan 1041.** The completion of this project was delayed by 3 years, and there was a 20% cost overrun. Similar to Loan 918, traffic forecasts at appraisal turned out to be over optimistic. At project completion, traffic growth and demand elasticities were scaled down. This resulted in a fall in the EIRR to 12.1%. Of the seven subprojects, one had a negative EIRR of -0.4%, while three others had EIRRs of less than 12%. Project implementation was delayed, as detailed in Appendix 6. Start-up delays were caused by (i) delays in establishing implementation units, (ii) nonavailability of government clearances, and (iii) land acquisition and clearance of trees and other utilities. However, despite these implementation issues, the EIRR at completion was higher than the benchmark 12%. Hence, the project is rated efficient.

7. **Loan 1274.** Little information is available on this project in ADB files. The fact that the project was approved in 1993 and the project completion report has yet to be prepared indicates a lack of efficiency on the part of both ADB and the Government of India. The base EIRR at appraisal was estimated at 37%. Allowing for optimistic forecasts, project delays, and lower traffic growth, it is perceived that the EIRR at completion will still be above the benchmark 12%. In view of this, the project is rated efficient.

8. **Loan 1747.** This project was inspected by the Operations Evaluation Mission and found to be of satisfactory quality. However, project completion was delayed by 19 months because of problems with the international contractors. The executing agency provided extra contractual

² One of the five subprojects had an EIRR that was lower than 12%.

³ For the Chennai-Cuddalore section of the East Coast Road.

assistance in the form of advance monthly payments. However, the project had no cost overruns. Economic analysis on this project has yet to be carried out, although initial reports indicate that the actual traffic is less than that estimated at appraisal. The project EIRR estimated at appraisal was 25%. Taking into consideration the lower growth in traffic, the EIRR could be less than 25% at completion. However, it is expected to be above the benchmark 12%, in any case. In view of this, the project is rated efficient.

2. Railway Subsector

9. **Loan 857.** Project completion was delayed by more than 5 years and one component was delayed by more than 11 years.⁴ While the main reason for the delay was the deferral of the Government of India's approval for the importation of the locomotives, the lack of familiarity of the Indian Railways with ADB's Guidelines for Procurement also contributed to the problems. The EIRR at completion, 15%, was lower than the estimated EIRR at appraisal (24.5%) but still above the benchmark 12%. The project is, therefore, rated efficient.

10. **Loan 1140.** Project implementation was delayed by 2.5 years because of procurement delays. The delays were attributable to the Indian Railways and the nonperformance of contractors due to security problems in the project area.⁵ Several loan covenants were not complied with. Project management was found to be wanting in several areas,⁶ and this was further exacerbated by the large number of project components. The EIRRs of various components are given in Table A9.3. Since all the EIRRs at completion were higher than the benchmark 12%, the project is rated efficient.

Table A9.3: Economic Analysis of Loan 1140

Component	EIRR at Appraisal (%)	EIRR at Completion (%)
Electrification	20.9	16.0
Third line	34.6	28.7
BOXN	15.9	15.0
Unit exchange	21.1	13.8

Note: BOXN are a type of freight wagons that handle bulk cargo.

EIRR = economic internal rate of return.

Source: Asian Development Bank.

⁴ The transfer-of-technology component was extended until March 2004.

⁵ The security situation in Bihar where the project is located was volatile, causing the contractor to leave the project area on several occasions.

⁶ These areas included slow tender evaluations, inability to identify critical problems and rectify them, and irregular reporting of progress.

ASSESSMENT OF ACHIEVEMENT OF ADB'S GOALS IN THE TRANSPORT SECTOR

1. Although not stated explicitly and systematically in strategy and program papers, the Asian Development Bank's (ADB's) sector goal for India's transport sector over the past 2 decades, as summarized by the evaluation team, have encompassed:

- (i) infrastructure physical development and capacity enhancement,
- (ii) institutional strengthening and capacity building of transport agencies, and
- (iii) poverty reduction through infrastructure-led growth.

2. The first goal has been mostly achieved or is being achieved in the different subsectors, subject to the resolution of the implementation issues highlighted in Appendix 5. The second goal has been partly achieved by virtue of some improvements in subsector management being demonstrated by the National Highways Authority of India (NHAI), Madhya Pradesh Road Development Corporation, and the major ports, although more progress is required in agency coordination, road safety, asset management, and operation and maintenance of national highways and state highways. The last goal has been partly achieved in the national highway, state highway, railway, and port projects, since the achievements have been limited to providing indirect benefits. In rural roads, the evidence suggests that some poverty-related benefits will be achieved once ADB-supported rural road projects are fully operating and on the assumption that ADB and the executing agencies pay closer attention to the intended "social inclusion" objectives of the projects. The following factors contributed to the underachievement of these goals.

3. First, some ADB-supported projects were based on overly optimistic traffic forecasts, notably on the Surat-Manor Tollway¹ and for the ports of Bombay (Mumbai) and Kakinada.² The overestimates of traffic using the ports, combined with the delays during implementation, resulted in economic internal rates of return on completion being less than estimated at appraisal but still in the satisfactory to highly satisfactory range. However, in the case of the ports, the assumptions made at appraisal related to traffic having full use of the new infrastructure on its completion proved to be incorrect. Similarly, even though the Surat-Manor Tollway has been open to traffic for almost 1 year, access to the new facility is constrained by ongoing construction to connect other sections of NH8 closer to Mumbai. As a result, traffic on the tollway is less than the estimate at appraisal. Once the other projects are completed, the traffic levels should increase. Despite the lower-than-expected traffic and delays in implementation, the economic internal rates of return for completed transport projects all exceed 12%, some by considerable margins.

4. Second, project implementation delays associated with public sector loans in the transport sector are the norm rather than the exception in India, with no apparent improvement over time. The delays ranged from 9 months to 5.5 years, and averaged more than 2.6 years for 12 completed projects. The longest delays occurred in the early road projects, where inexperienced public works departments were the executing agencies and the projects involved several states, and in railways. While project implementation delays are common in most ADB public sector loans across countries and sectors,³ the magnitude, impact, and causes of such

¹ ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Surat-Manor Tollway Project*. Manila (Loan 1747-IND, for \$180 million, approved on 27 July).

² ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to India for the Second Ports Project*. Manila (Loan 1016-IND, for \$129 million, approved on 29 March).

³ Across sectors and countries, since 1998, the average delays for ADB-financed projects (measured by loan closing dates) for all sectors is 0.8 year for the People's Republic of China, 1.4 years for Sri Lanka, 1.7 for Thailand, and 2.4 years in the Philippines.

delays in the India transport sector need special attention from ADB and the Government. The impact of the delays includes deferred project benefits and charges for higher interest during construction. The delays also result in higher ADB loan commitment charges incurred by the Government of India. These issues could be attributed to inappropriate project scheduling at appraisal. Project designs need to adopt more realistic schedules that reflect the risks of unforeseen delays. There are also questions about whether ADB and the Government seriously screen projects for readiness or take the loans to ADB's Board prematurely to meet annual lending targets.

5. Third, the focus on the National Highway Development Program, port connectivity, and Pradhan Mantri Gram Sadak Yojana programs to improve and expand the national highways network and rural roads is resulting in priority being given to road construction and upgrading, with little regard for network planning and integrity (including the need for access controls and improved interface between national highways and urban road networks); appropriateness of standards (e.g., paving roads in rural areas with low traffic volumes); traffic operations (particularly at state border crossings); and systematic road maintenance. NHAI is reputedly delaying operation and maintenance considerations because of the higher priority given to the six-laning of the Golden Quadrilateral national highways. For the same reason, recommended road safety remedial measures arising from road safety audits on ADB-funded projects are being postponed. Traffic accidents on India's roads continue to increase in number and severity as the network is expanded, roads and highways are improved, and vehicle speeds increase, and little provision is made for improving general safety awareness, introducing effective enforcement of traffic laws and regulations, or ensuring safe-crossing facilities for pedestrians. ADB's projects and technical assistance projects assessed appear to have been less than effective in addressing India's serious road safety problem.

6. Fourth, ADB's participation in transport sector projects in India has been primarily focused on engineering, procurement, construction, i.e., relating to civil works and capital investments, with little apparent consideration of developmental project elements, whether stated or implied within the project objectives.⁴ The developmental elements include, but may not be limited to, progress made in institutional capacity building (particularly with respect to the operation and likely sustainability of new systems and procedures), social objectives (including poverty reduction and gender equality), and ways to improve safety during construction and on project completion. ADB project loan documents would benefit from the inclusion at the outset of objectively verifiable indicators and targets agreed on by ADB and the Government to strengthen monitoring, and those relating to project goals and objectives. These indicators and targets could be used for closer monitoring of projects by both ADB and the Government during implementation. Agreements were reached with the World Bank on a joint monitoring framework for transport sector projects as mentioned in the current country strategy and program (Appendix 11), but the evaluation team found no evidence to suggest that the performance indicators are being routinely used by ADB staff. The evaluation team also noted that the framework for the transport modes could usefully include socioeconomic indicators.

7. Fifth, several of the recent loans appear to be overly ambitious, poorly designed, and based on incomplete analysis of the causes of the problems facing the sector. ADB underestimated the potential complexity and difficulties of carrying out such far-reaching reforms. Both NHAI and Indian Railways are pursuing subsector and policy reforms, but at their own pace.

⁴ As a result, the evaluation team found little incremental "value addition" of ADB's involvement in either state highways or rural road improvement projects, compared with those projects funded by others, including the Government of India.

Many of the ADB transport sector loans in India have included too many conditions, many of which are nonbinding, too vague, and ineffective. In several cases, the loan covenants have contributed to project implementation delays.⁵ In any event, compliance with all the conditions may not have guaranteed the achievement of the main purpose, which has been to:

- (i) establish responsibility for managing roads, highways, and railways by clearly defining roles for government organizations;
- (ii) create ownership of roads by involving road users in their management;
- (iii) ensure a stable, secure, and adequate flow of funds for roads, highways, and railways; and
- (iv) strengthen transport sector management⁶ by introducing sound business practices and management accountability.

8. Sixth, ADB's projects have consistently used the project implementation unit model for project implementation. This requires the transfer of staff from their parent organizations, such as the Public Works Department. While this does provide a focus on implementing the ADB project, there may be a tendency to divert more talented staff to the project implementation units, thereby weakening the day-to-day business and responsibilities of the public works departments. Discussions with public works departments indicated that the combination of a recruitment freeze (to reduce costs) and staff attrition due to retirement and transfer to project implementation units, has led to a decline in performance of the parent department vis-à-vis the project implementation unit. In several ADB projects, there have been delays during implementation caused by inadequate staffing or performance of the project implementation units, even with support from the state Public Works Department and—in the case of Chhattisgarh—from ADB directly. However, it needs to be recognized that the project implementation unit model has been effective in streamlining the project implementation and has become a familiar model for government departments to adopt, over the years. Despite its laws, it is still an effective model for implementing ADB projects.

⁵ In the case of the Madhya Pradesh Program Loan, the labor rationalization requirement was found to be difficult to implement. In a number of cases, the evaluation team was informed that implementing ADB's environmental and social safeguards tends to delay projects, although no direct link could be identified in this regard. Another example is the procedure established for approving subprojects by ADB headquarters in Manila, which tends to lengthen the process.

⁶ Transport sector management refers to the creation of a commercially-oriented transport sector and its responsible agencies to manage roads and highways, railways, ports, and inland waterways transport (and air). The purpose is to ensure that transport users receive value for money from sector spending by the agencies. The concept envisages the establishment of clear management objectives, effective management structures, competitive terms and conditions for employment, consolidated budgets, commercial costing systems, a level playing field for competitive services sector-wide, and effective management information systems with benchmarked targets and publicized performance indicators and results. The concept also includes the efficient use of plant and equipment, transparent tendering processes, and a focus on the contracting out of services as far as possible, effective controls on vehicle overloading (passengers and freight), and improved safety for transport system users.

SUSTAINABILITY OF ADB-ASSISTED PROJECTS

A. National Highways

1. The sector assistance program evaluation (the evaluation) included a study to evaluate the financial planning, cash-flow management, and resource augmentation possibilities for the National Highway Development Program (NHDP) of the National Highways Authority of India (NHAI). This study has resulted in the development of a financial forecast model for the NHDP in conformity with the financing plan prepared by the core group that was set up within the Committee of Infrastructure by the Prime Minister¹ to coordinate the financial planning for NHDP. This was a standalone planning exercise for NHDP, without taking into consideration the funding needs of other similar infrastructure development programs and the market appetite for long-term debt to finance infrastructure projects. A large, multiyear public-private partnership program has been assumed. NHAI has been successful so far in inviting private sector participation, and it appears that the private sector is willing to invest in NHDP projects, although there may be limitations on the number of sponsors in India. If and when other competing sectors or subsectors (e.g., energy, health, water supply and irrigation, pipelines, ports, railways, urban transport) are opened more widely to private sector investments, the investment flow is likely to be determined by the relative attractiveness of the competing opportunities.²

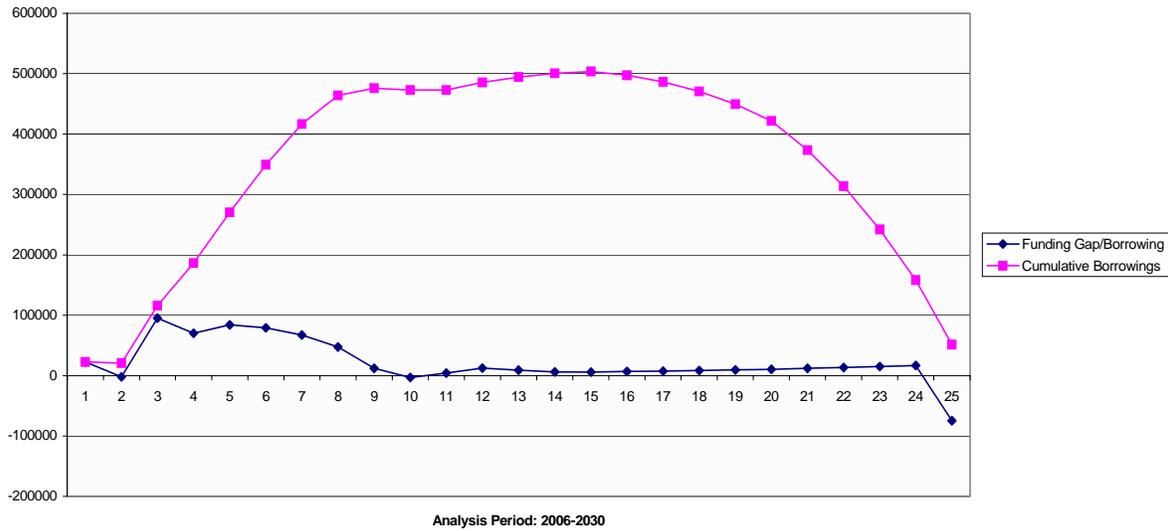
2. Critical results displayed by the financial model developed by the evaluation study relate to the yearly funding gap, cumulative funding gaps, sensitivity tests with nominal budgetary support from the Government of India besides the cess and toll surpluses, and charts for total fund utilization, capital and maintenance expenditures, funding gap, and cumulative market borrowing corresponding with the cumulative funding gap. These results have been analyzed for the cash-flow period 2006–2030. Given below are the summary results of the financial model.

3. The financial study analyzed sustainability from the point of view of the funding gap and the ability of NHAI to fill the gap. The NHDP core group has considered market borrowings on a net requirement basis, i.e., the deficit between the estimated expenditure under phases I–VII (including payment of annuities and interest cost on market borrowings) and receipts. The financial study followed the same principle in estimating the funding gap each year and the corresponding requirement for market borrowings. Cumulative total outstanding balances for market borrowings were derived by including debt repayments proposed and interest liabilities outstanding. Debt repayment used for the evaluation study is the same volume of funds as in the report of the core group. Charts showing the funding gap and cumulative market borrowings outstanding for each year of the analysis period are in Figures A11.1 and A11.2. Figure A11.1 illustrates the scenario with no maintenance by NHAI, and Figure A11.2 illustrates the scenario with NHAI maintenance.

¹ For more details, refer to the Committee on Infrastructure website at www.infrastructure.gov.in.

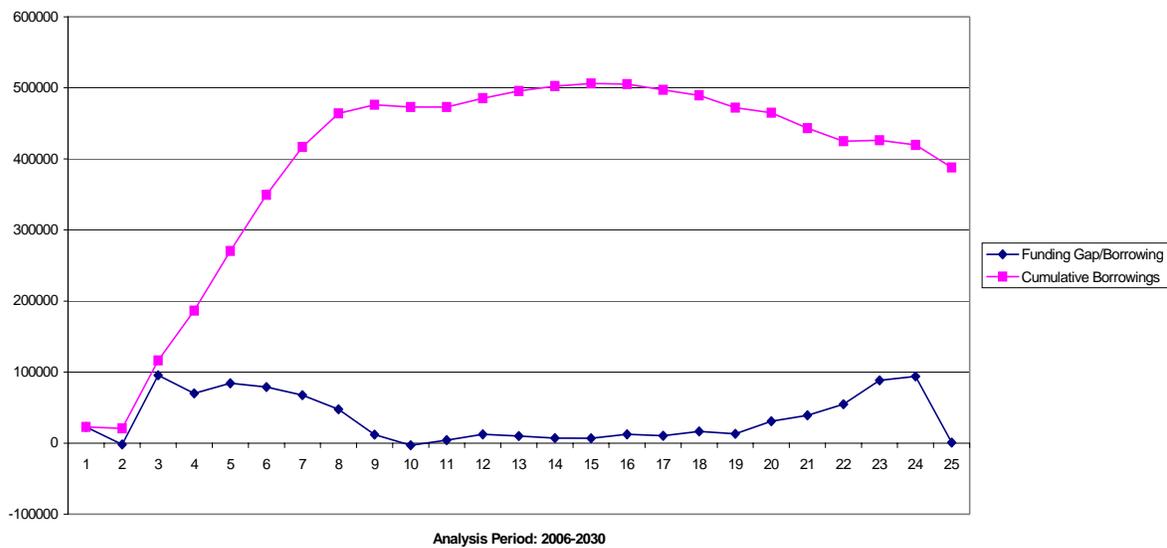
² Evidence of the growing market tightness is seen in market reports that state that NHAI was not able to raise enough funds through the bond market in the last 3 years (Source: CRIS INFAC Report on Roads and Highways, October 2005, www.crisinfac.com).

Figure A11.1: Funding Gap and Cumulative Market Borrowings Outstanding without NHA Maintenance



NHAI = National Highways Authority of India.
 Source: Operations Evaluation Mission. The analysis period in the above chart represents a 25-year forecast from 2006 (shown as year 1) to 2033 (shown as year 25).

Figure A11.2: Funding Gap and Cumulative Market Borrowings Outstanding with NHA Maintenance after the Concession Period



NHAI = National Highways Authority of India.
 Source: Operations Evaluation Mission. The analysis period in the above chart represents a 25-year forecast from 2006 (year 1) to 2033 (year 25).

4. The plots for the initial period are largely congruent under both scenarios when the maintenance liability rests with the concessionaires. In the first scenario adopted by the core group, NHDP appears to repay its liabilities faster in the last years of the analysis period as no

further costs accrue to the program. However, since the maintenance liability is transferred to NHAI at the end of the concession period, the funding gap persists (Appendix 9). Because of financial and human resource concerns, the national highways portfolio was rated as **less likely to be sustainable**. This is a major concern and identifies issues that need to be considered by both the Government of India and the Asian Development Bank (ADB).

5. Some amendments have been made in the financial projections to account for critical sustainability features resulting from the life-cycle costs of the NHDP. Assets transferred to NHAI after the build-operate-transfer concession period have to be maintained by NHAI. The costs of maintenance will, therefore, be borne by NHAI. Following the life-cycle costing pattern for all NHDP phases, the allocation of maintenance costs has been made in this study. The study showed that it may be possible to partly offset the maintenance costs to NHAI if toll collection beyond the concession period is permitted on all roads including the two-lane development under NHDP IV. The core group's financial planning was conducted on the basis of expenditures planned (including payments of annuities) and identifiable sources of finance from the Government of India in the form of tax revenue and toll collection. The funding gap arrived at after matching costs and sources is proposed to be financed with market borrowings.

6. The financial sustainability indicators for the NHDP are summarized in Table A11.1.

Table A11.1: Revenue Strategy and Cash-Flow Strategy-Related Indicators

Financial Sustainability Indicator		Possible Threat to Sustainability	Action Recommended	Remarks
Stability and continuity of revenue streams	Cess	Cess is recovered on the sale of petrol and diesel. It amounts to being a user levy. There may be public resistance if prices are increased.	If cess revenues are insufficient, the Government needs to commit that any shortfall will be met by budgetary support for NHDP to proceed as planned.	
		Cess does not belong to NHAI. It has been projected to grow at 3% per year. Allocations are made by the central Government on the basis of an agreed allocation formula. Any changes in the sharing formula can affect program delivery.	Government of India needs to commit that adequate financial support will be provided for NHDP to proceed as planned. If this cannot be done, the scale of the NHDP will need to be reduced.	
	Toll	Tolls are user charges. All future projects are to be constructed on a BOT basis. Except for phase IV projects, all projects are likely to be tolled. For phase IV projects, the decision to toll has yet to be taken by the Government. User refusal to pay creates uncertainty for the program.	Government of India should commit to providing adequate financing for NHDP to proceed as planned. A detailed study of the viability and sustainability of such a large tolling program may be required.	Toll rates may be increased each year on the basis of a formula linked to WPI up to a threshold barrier limit.
		Core group recommends that additional resources for NHDP may be mobilized by: <ul style="list-style-type: none"> Increasing toll rates; Improving toll collection; or Increasing cess rates. 	All these measures are aimed at collecting more from users. The risk of resistance to mobilization could be mitigated with a commitment from the Government for budgetary support.	Both toll and cess are in the nature of user charges and any increases could be a sensitive issue for the public.

Financial Sustainability Indicator	Possible Threat to Sustainability	Action Recommended	Remarks
Continuity of assurance, support and commitment of lending, and investor community	Market borrowings are intended to be raised largely from the banking system. These would be principally long-term borrowings, given the cash-flow profile of NHDP. The banking system may not be in a position to take such long exposures (10 years' tenor) and on such a large scale on account of regulatory conditions, risk perception, or asset-liability mismatch.	A holistic view has to be taken. NHDP financing plan is a standalone study. Views and perceptions of other players in program delivery need to be taken into account.	MDBs could be a useful resource in this direction as all their financing is long-term. FDI route can be explored. Perhaps ADB's risk mitigation products could be adopted to help address this issue and help to mobilize domestic financing.
	Indian Railways is embarking on an ambitious development program. Other infrastructure sectors are also proposing large programs with a large component of borrowings. Resource availability and risk management regulations may restrict the size of funding from both the banking system and long-term lenders.	Financial sector programs will need to be studied as a sequel to this study, to provide a more holistic view.	The Rakesh Mohan Committee formed by the Government evaluated the needed financial market reforms in its report on infrastructure. This evaluation will need to be updated.
Stability and reliability of such a large PPP-oriented development program	If the entire phased development program is considered, there may emerge more than 500 different sections to be developed under concession arrangements (both BOT toll and annuity). To participate in these 500 concession arrangements, there may be about 30-odd promoters/consortiums. This may lead to overstretching of the contracting, consulting, project management, and equity investment positions of the potential players.	Only parties with adequate capacity, capability, and resource base should be allowed to enter into this area. Speculators should be kept out. Contracting capacity should be assessed. Capacity building in contracting/consulting industry is required.	MDBs can provide technical assistance. One such study is likely to begin soon at NHAI.
	NHAI has limited experience in handling such a large PPP program. Lack of expertise and overdependence on a limited advisory resource could hamper progress.	Institutional strengthening and capacity building on an organization-wide basis are required immediately.	MDBs can play a role in this area.
	Financing plan recommended by the core group lists only program developments up to phase VII of NHDP. Construction and delivery under all these phases would be complete by 2014 or so. No maintenance program has been provided for NHAI. After creating such a large and vibrant organization, not instituting rigorous maintenance regimes would be a risk to organizational sustainability.	NHAI's capacity for maintenance and corridor management activities needs to be strengthened after future organization development needs are assessed.	Assistance from strategy and organizational development consultants can be sought.
Depth and reach of the financial sector	NHDP financing is being planned principally through private sector participation, market borrowings, cess revenues earmarked for NHAI, and toll collections. Market borrowings and the private sector contribute a large part of NHDP financing. The private sector will resort to market borrowings to finance SPVs implementing concession projects. Accordingly, the lending	A holistic study needs to be carried out. Such a multisector analysis will provide an assessment of the overall size of the financing pool. Financing assistance can be augmented by inviting	MDBs can assist in such a multisector assessment program.

Financial Sustainability Indicator	Possible Threat to Sustainability	Action Recommended	Remarks
	community (banking sector) will fund most of the financing needs of NHDP. Prudential norms for sector exposure may limit the availability of domestic funds.	MDBs and FDI.	

ADB = Asian Development Bank, BOT = build-operate-transfer, FDI = foreign direct investment, MDB = multilateral development bank, NHAI = National Highways Authority of India, NHDP = National Highway Development Program, PPP = public-private partnership, SPV = special-purpose vehicle, WPI = wholesale price index.
 Source: Operations Evaluation Mission.

7. The results of the evaluation of the NHDP and the need to ensure long-term sustainability are illustrated in Figure A11.3 and in Table A11.2, which shows the NHDP evaluation analysis indicators for each element of sustainability.

Figure A11.3: National Highway Development Program Evaluation Results

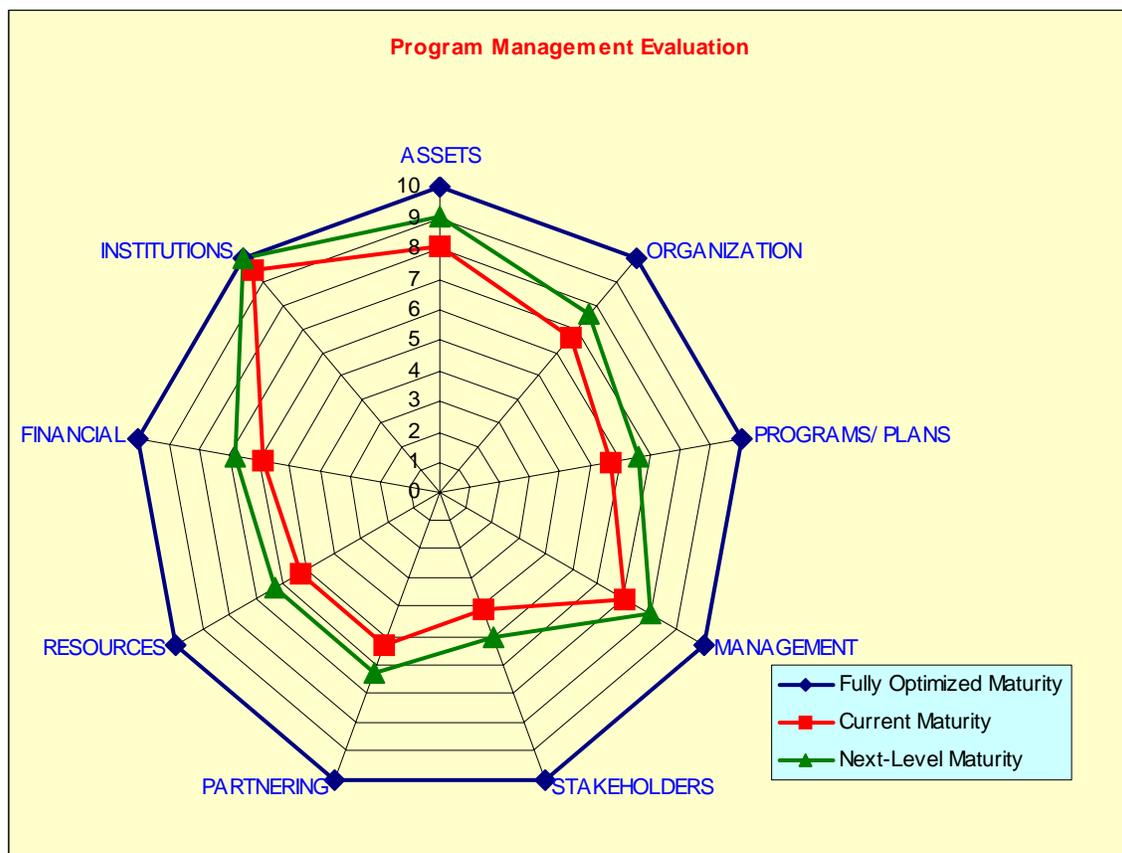


Table A11.2: Assessed Status of NHDP Sustainability and Recommended Actions

Elements of Program Sustainability	Assessed Indicators	Status and Recommended Actions
Assets	8.056	Program enjoys high investor confidence
Organization	6.591	Strengthen training and development activities
Programs and plans	5.625	Strengthen planning and programming unit
Management	6.944	Strengthen business processes
Stakeholders	4.063	Strengthen consultation processes and safeguard measures
Partnering	5.313	Strengthen partner capacity
Resources	5.227	Strengthen administrative support
Financial	5.833	Widen financial resource base
Institutions	9.500	Program enjoys high investor confidence

NHDP = National Highway Development Program.
Source: Operations Evaluation Mission.

1. State Highways: Madhya Pradesh

8. The financial position of most state governments remains weak because of their high level of debt obligations and the guarantees extended to various infrastructure and other projects. Even the progressive states could find it difficult to disburse adequate funds for road rehabilitation and maintenance. In the case of Madhya Pradesh, while there has been an improvement in the fiscal deficit position and the state government has been making efforts to provide adequate funds for rehabilitation and maintenance, the state government's debt obligations remain an issue (Table A11.3).

Table A11.3: Madhya Pradesh State Government Financial Position—Key Indicators

Item	2001– 2002	2002– 2003	2003– 2004	2004– 2005	2005–2006 (revised estimate)
Revenue deficit/GSDP (%)	3.75	1.42	5.00	(1.71)	0.02
Debt/GSDP (%)	31.17	36.45	42.26	44.17	44.24
Revenue/GSDP (%)	13.32	16.23	15.97	19.64	18.89
Revenue deficit/Revenue (%)	28.15	8.74	31.31	(8.71)	0.10

GSDP = gross state domestic product.

Note: () for revenue deficit implies revenue surplus.

Source: Reserve Bank of India. Several years. *State Finances: Study of Budgets*. Reserve Bank of India, Mumbai.

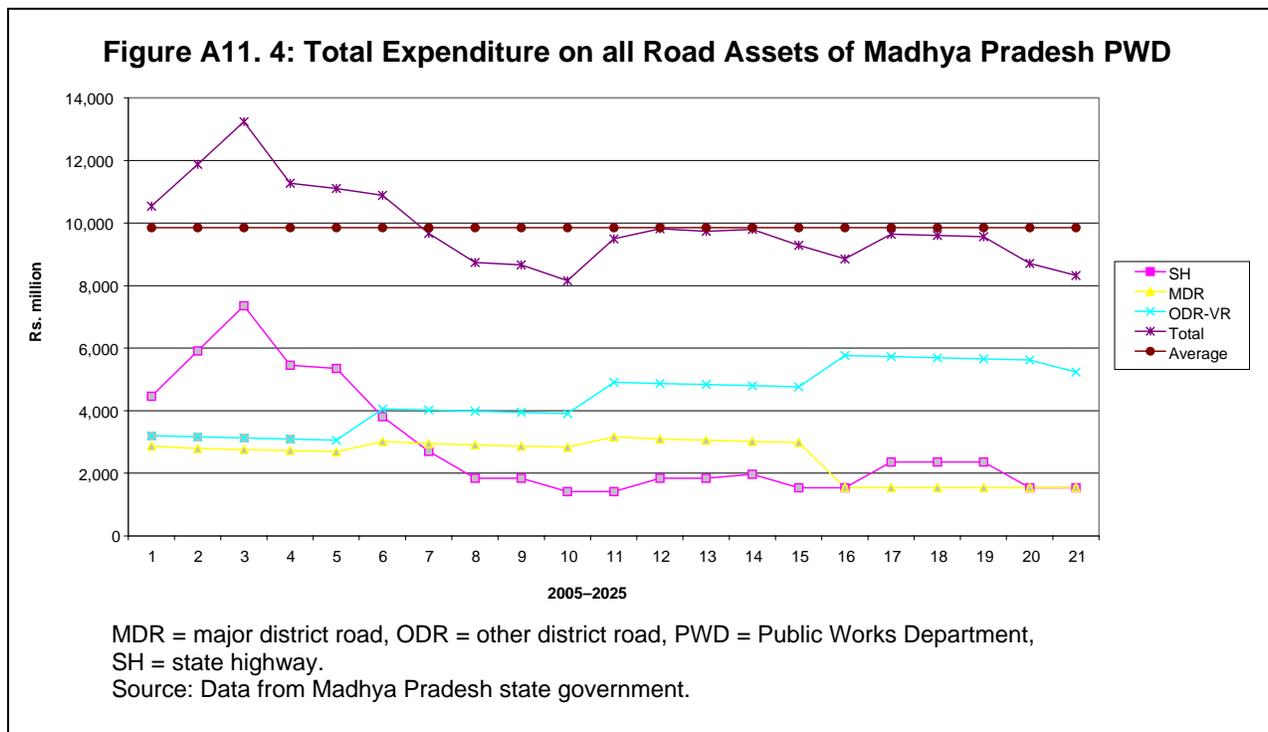
9. Although the Madhya Pradesh state government has discouraged the establishment of a dedicated road fund, it is committed to ensuring that rehabilitated roads are maintained adequately. The current pace of reforms in the state is appropriate and sustainable. The level of technical resources available within the Madhya Pradesh Road Development Corporation as well as Public Works Department remains a concern, given the current recruitment freeze and the gradual attrition resulting from staff retirements and transfers to project implementation units. To address this matter, the Madhya Pradesh Road Development Corporation intends to recruit technically qualified staff directly to create a more sustainable human resource base. Taking into consideration the improvement in the fiscal deficit position of Madhya Pradesh, the state highway projects in the state are deemed sustainable. This rating assumes that continued budget allocations are supplemented with long-term funding from development partners. On the

other hand, it is still too early to assess the sustainability of state highway projects in Chhattisgarh where reforms and project implementation are at an early stage.

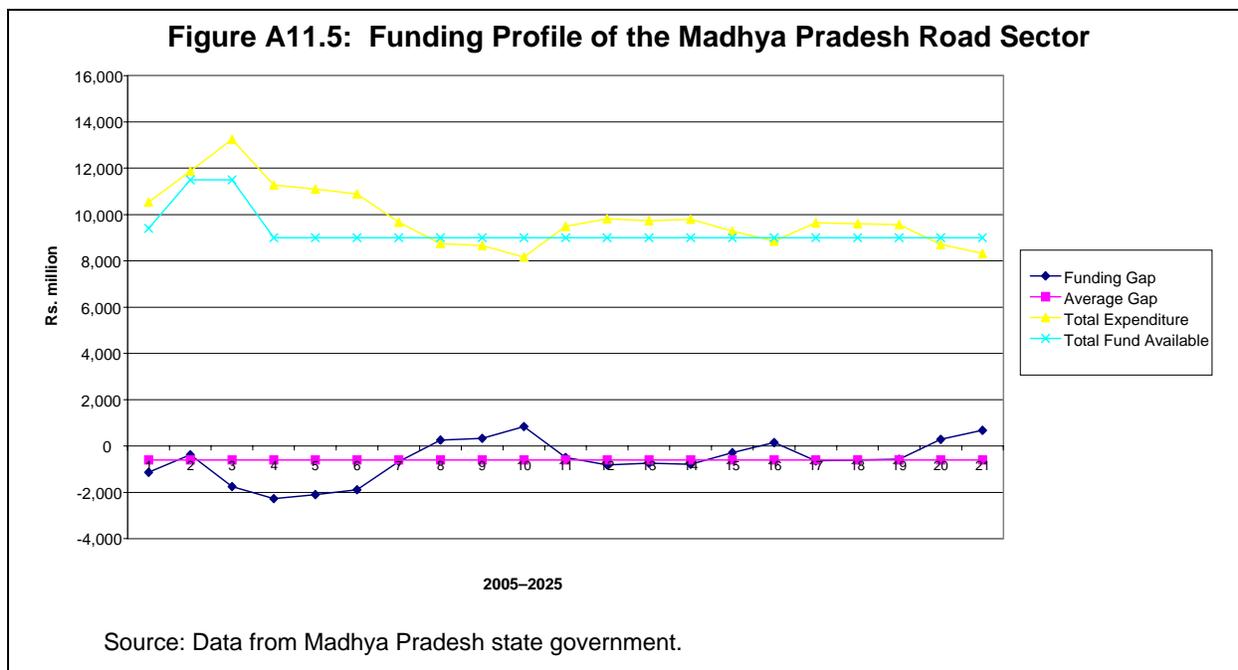
10. The evaluation financial study included an analysis of the expenditure profile for life-cycle costs of different class of assets—state highways, major district roads, other district roads/village roads. Planning assumptions for the period 2005 to 2025 are as follows:

- (i) All state highways are likely to be rehabilitated by 2011;
- (ii) All major district roads are likely to be rehabilitated by 2019;
- (iii) All other district roads/village roads will be rehabilitated by 2024; and
- (iv) Routine and periodic maintenance will be in accordance with the Ministry of Roads Transportation and Highways/Indian Roads Congress norms.

11. Total expenditure on all types of road assets (state highways, major district roads, and other district roads/village roads) is presented in Figure A11.4.



12. The average yearly expenditure required for the period of analysis is around Rs10 billion (\$222 million), excluding the staff and establishment costs of Public Works Department and the Madhya Pradesh Road Development Corporation. The funding gap is profiled in Figure A11.5.



13. As is evident, there persists a funding gap of Rs2 billion in the initial planning years. This funding gap reduces after 2012 on account of a reduction in expenditure on state highways, these having been rehabilitated in full and there being no conversion of major district roads into state highways during the analysis period.

14. The funding gap could be bridged by market borrowings and extra-budgetary resource augmentation. If the program is pursued as assumed, there exists relatively less serious threat to its sustainability unless the state dilutes its priority of road sector development or accelerates the rehabilitation of major district roads and other district roads/village roads.

2. Rural Roads

15. The centrally sponsored Pradhan Mantri Gramin Sadak Yojana has a planned expenditure of about \$10.56 billion (Table A11.4). Until December 2006, aggregate funds available from budget allocations, tax collections, and external assistance from the World Bank and ADB totaled \$9.2 billion, for a shortfall of more than \$1 billion. The Central Road Fund Act provides for the use of 50% of the diesel tax for rural roads. Development partners have approved loans totaling \$2.05 billion for rural roads. The Government of India will need to fill the funding gap of \$1.36 billion in the medium term.

Table A11.4: Funding for Rural Roads

Rural Road Expenditure		Broad Sources of Funding	
Planned expenditure up to 2010 ^a	\$10.560 billion	Cess from diesel up to 2008	\$3.520 billion
		ADB I and II ^b	\$1.150 billion
		World Bank I and II	\$900 million
		Loan from NABARD	\$3.630 billion
		Total committed to date	\$9.200 billion
		Funding Gap: \$1.360 billion	

ADB = Asian Development Bank, NABARD = National Bank for Agriculture and Rural Development.

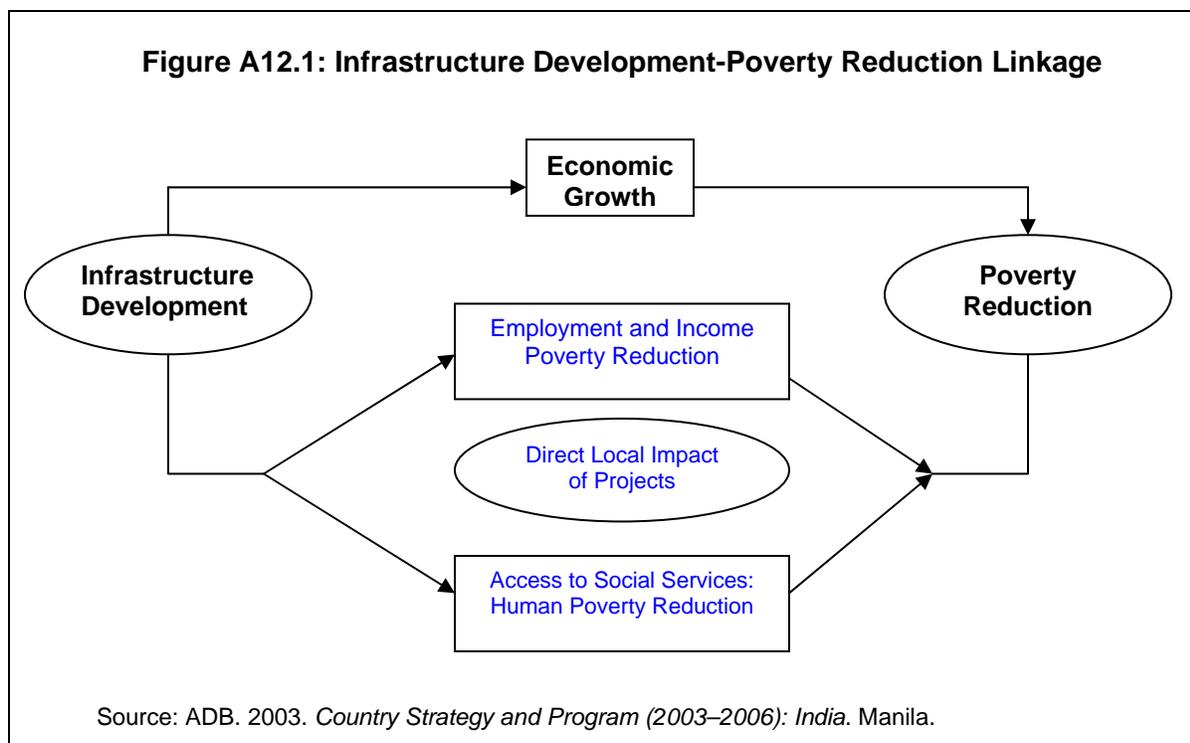
^a This does not include the cost of maintenance after rehabilitation.

^b This includes a multitranches finance facility of \$570 million, which has not been fully converted into loans.

Source: Ministry of Rural Development, 2006.

SOCIOECONOMIC EFFECTS OF ROAD IMPROVEMENTS

1. The infrastructure-poverty linkage is indirect, as illustrated in Figure A12.1 below.¹ A review of the literature² found that (i) economic growth is positively affected by the stock of infrastructure assets, and (ii) income inequality declines as infrastructure quantity and quality improve. As regards transport interventions, the World Bank's Poverty Reduction Strategies Sourcebook indicates that improvements in transport have the greatest impact on poor people when other sectoral interventions are adequately in place. Without good transport, many other sectoral interventions are likely to be ineffective.³



2. A comparison of the impact of various public investments on poverty reduction indicates that roads have an important contribution. Studies in various Asian countries indicate a variable correlation between roads and poverty reduction (Table A12.1). In India, this correlation between roads and poverty reduction is ranked at the top of the scale.

¹ ADB. 2003. *Country Strategy and Program (2003–2006): India*. Manila.

² The review included various literature from the Asian Development Bank (ADB) and World Bank, among them, a recent ADB publication, Cook, C., T. Duncan, S. Jitsuchon, A. Sharma, and W. Guobao. 2005. *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*. ADB: Manila.

³ Klugman, J., ed. 2002. *A Sourcebook for Poverty Reduction Strategies*. World Bank: Washington, DC.

Table A12.1: Public Investment and Poverty Reduction

Sector for Public Investment	Ranking of Returns in Poverty Reduction			
	People's Republic of China	India	Thailand	Viet Nam
Agricultural R&D	2	2	2	3
Irrigation	6	7	5	4
Education	1	3	4	1
Roads	3	1	3	2
Telecommunications	5			
Electricity	4	8	1	
Health		6		
Soil and water conservation		5		
Anti-poverty programs	7	4		

R&D = rural and development.

Source: Thorat, S. and S. Fan. 2007, 24 Feb. Public Investment and Poverty Reduction: Lessons from China and India. *Economic and Political Weekly*. Available: <http://www.fanrpan.org/documents/d00240/>

3. This evaluation of the transport sector included a socioeconomic study of the road and highway subsector in selected parts of Gujarat and Maharashtra (Surat-Manor Tollway, national highways 8), and state highways and rural roads in Madhya Pradesh. The evaluation also tried to assess issues for the recent trend in the Asian Development Bank (ADB) road and highways projects related to increased social integration for infrastructure projects. The socioeconomic assessment was aimed at:

- (i) measuring the socioeconomic and cultural changes resulting from the improvement of roads, such as changes related to livelihood patterns, industrial development, road safety, HIV/AIDS cases and trafficking risks, access to market areas, and farm-gate prices;
- (ii) identifying key issues in the transport sector and assessing how the road improvement projects have addressed these issues; and
- (iii) assessing and establishing the linkage of socioeconomic improvements and livelihoods with road development.

4. A sampling of areas was undertaken covering the three categories of roads for the following reasons:

- (i) National highways contribute to the national economy and indirectly affect local economies through industrialization, increased mobility, and increased economic opportunities.
- (ii) State highways affect the regional economies, while also serving as links between the rural economies and the state and national economies.
- (iii) Rural roads have localized impacts by providing access to remote rural communities and farmers.

5. The areas were selected to reflect a representative sample of all social categories and groups, which may be considered generally typical of other parts of the country. The assessment used a process of preliminary social profiling and impact analysis of the study area affected by the selected national, state, and rural roads. The assessment drew on consultations with local stakeholder groups, semistructured interviews with representatives of social groups, and a review of available secondary data to identify local perceptions of impacts. For rural roads, a comparison of with-road and without-road scenarios was carried out in villages in two districts of Madhya Pradesh. Some of the villages had all-weather road connectivity, while others were without a road connection. The results of the socioeconomic study are summarized in Table A12.2.

Table A12.2: Socioeconomic Effects of Road Improvements

Socioeconomic Parameters	Road Type		
	National Highways	State Highways	Rural Roads
Travel time and costs	Travel times in the national highway 8 (NH8) corridor have been greatly reduced by the road improvements. Local communities now enjoy enhanced accessibility to socioeconomic services (health centers, markets, employment opportunities), with reductions of 50% or more in travel time. Reduced travel times have reduced vehicle operating costs (VOCs) for local communities and auto rickshaw, bus, and truck operators, thereby reducing maintenance costs and increasing profits. However, there has been no reduction in fares; on the contrary, some fares have increased because of an increase in the cost of fuel, thereby increasing travel costs for the local communities.	On all three state highways (SH) studied, the road improvements have reduced the travel time between local villages and district headquarters, agricultural markets, health centers, and other nodal centers. Reduced travel times have also reduced VOCs for the local communities, transporters, and bus and truck operators, thereby reducing maintenance costs and increasing profits. A key concern of lower- and middle-income groups, however, was that reduced travel times and VOCs have not resulted in lower fares. Fares have increased because of petrol and diesel price hikes, thereby increasing travel costs for the local communities.	In villages provided with road access, significant travel time reductions have resulted. For the local rural communities, access to socioeconomic services (health centers, markets, employment opportunities) has been enhanced by reductions of 50% or more in travel time. Reduced travel times and improved road conditions have also reduced VOCs. As a result, some service providers have reduced fares, although such reductions have not occurred in all areas and some operators have also raised fares because of fuel price increases.
Road transport services	More services are now available along the route (large/small buses, trucks/pickups, three-wheelers, etc.) via private and public sector operators. More frequent and better-quality services are available around the clock. As a result, there has been a mode switch from rail to road by local passengers traveling from Surat to Mumbai.	On all three SHs, road transport services have become much more frequent and operate around the clock. However, the higher travel costs and toll tax serve to reduce business profits and act as an impediment to the mobility of the poorer groups. As a result, the smaller farmers sell their produce in the local markets at lower prices.	The study determined that five out of the six sample villages with no bus service before the new road access now have privately operated bus services. In other villages that had a prior bus service, there was an improvement in service frequency after the road upgrading.
Access to health services	The improved access to health services has resulted in the majority of child births taking place in local hospitals, with more pregnant women being able to access the local government health centers and hospitals. However, there has been little change in government health programs at the village level, with most villages receiving only polio immunizations and reproductive and child health (RCH) camps.	The SH improvements have given the local population better access to health facilities at all times, and have reduced the risks of both maternal and child deaths. Pregnant women can now visit local government health centers and hospitals regularly. However, there has been little change in government health programs at the village level, with most villages receiving only polio immunizations.	The rural road improvements have given villagers and especially pregnant women better access to local government health facilities at all times. Most deliveries are now done by trained medical practitioners. This was not possible previously when villages were cut off by the monsoon rains. The more efficient transport systems also enable more frequent antenatal and midwife (ANM) visits to villages. However, there has been little change in government health programs at the village level, with most villages receiving only polio immunizations.

Socioeconomic Parameters	Road Type		
	National Highways	State Highways	Rural Roads
<p>Income and employment</p> <p>- Small shops and <i>dhabas</i></p> <p>- Effects on the poor</p>	<p>Income and employment opportunities have increased as a result of the diversification of commercial enterprises. Overall, connectivity has increased investments in nonagricultural microenterprises and in transport services. Local villagers have invested in small hotels and petrol pumps, and the tollway has created employment opportunities for locals at the toll booths and weigh stations. However, the majority of local households still depend on agriculture as their primary source of income. Others depend on daily wage labor, both agricultural and nonagricultural, and the improved connectivity has given them better access to opportunities in nonagricultural work, including the ability to commute every day. Improved travel times have had a negative impact on some local businesses, as fewer drivers stop in the area. Larger, better-quality restaurants with formal parking areas have developed, providing competition for local small businesses. Many small local businesses have been affected by roadside fencing (to control access) and the dual carriageway (limiting access to one side only). Employment opportunities with the road contractors during construction did not materialize.</p>	<p>There have been different types of income and employment effects on the various local stakeholders. The most benefit has been derived by the higher- and middle-income groups. The poor have remained untouched by the developmental benefits. Major investments were made by the better-off groups, which invested in enterprises, hotels, and shops along the SHs and also in transport services. Similarly, the middle-income groups invested in small business enterprises. Poor households with little investment resources at their disposal did not derive significant economic benefits from the SHs. A large part of the local poor derive their livelihood from daily wage labor (agricultural and nonagricultural). They have benefited to some extent from improved connectivity through improved access to nonagricultural work. Increased traffic volumes on the improved SHs have resulted in more business for <i>dhabas</i> (roadside restaurant), but less for existing vehicle repair shops, because of the road improvements.</p> <p>The local poor were not employed during SH civil works, since most of the contractors' workforce were migrant workers.</p>	<p>There has been a gradual change in terms of increased income and employment opportunities in the area as a result of the road projects. During road construction, many locals were also able to access employment opportunities under the Employment Guarantee Scheme (EGS) of the Government, which paid them the standard daily labor rate. However, the majority of the households in the area are still dependent on agriculture as their primary source of income and the major investment continues to be in agriculture.</p> <p>The roadworks benefited the local poor and wage laborers to some extent by providing limited site-work opportunities.</p>
Land values and investments	Roadside land values have increased as a result of better accessibility and new business opportunities in the area. However, the key beneficiaries are mainly those with large landholdings and diversified sources of income, who are able to sell their land or make investments in motels, service stations, etc., along the NHs. These are mostly outsiders from Surat and Mumbai rather than from the local community.	Roadside land values have increased as a result of better accessibility and new business opportunities in the region. The key beneficiaries have mainly been those with large landholdings and diversified sources of income, who have sold their land or made investments in services stations and <i>dhabas</i> along the improved SH.	Land values in the sample villages increased significantly following the road improvements, as a result of the better accessibility and business opportunities in the region.
Education	Education and enrollment were not affected, particularly in the case of girls, for whom	No particular effects on education were identified. The evident high dropout rate	The road improvements have led to a gradual increase in school enrollment

Socioeconomic Parameters	Road Type		
	National Highways	State Highways	Rural Roads
	education is a sociocultural issue in the area, with the poor as well as higher-income groups not sending their girls to school after middle school.	from community middle schools among both boys and girls is attributed more to the social fabric than to lack of access to educational facilities.	among both girls and boys at secondary and tertiary levels. In particular, there has been a sharp increase in the number of girls going outside the villages for high school and college. There has also been a major reduction in the primary- and middle-school dropout rate since the road improvements. This is the result of more primary teachers being able to access the village schools in all kinds of weather, and the fact that children can travel outside the villages for middle- and high-school education.
Road safety	<p>There has been a decrease in road collisions as a result of the two-way divided NHs, but the severity of accidents and the number of deaths (fatal accidents) have increased. In several areas, villages are located on one side of the NH, whereas schools are located on the other side, with no provisions for an underpass or a pedestrian footbridge. The main causes of serious traffic accidents were:</p> <ul style="list-style-type: none"> - Intersections, where there have been more fatal accidents and an increase in collisions between heavy vehicles such as trucks, cars, and motorcycles; - Insufficient signs and signals at or before the intersections and at key areas such as schools and hospitals; and - Lack of safe-crossing facilities for villagers (including children) crossing the highway. <p>The road safety campaign included in the Asian Development Bank (ADB) report and recommendation of the President (RRP) for the Surat-Manor Tollway Project has not been implemented.</p>	Road safety remains a key concern on all three improved SHs. More motorized vehicles pass through the villages at higher speed. Traffic accidents are increasing in frequency and severity and, since the SH carriageway has been elevated in some village habitation sections, the local communities have voiced concerns about the increased safety risks in these areas. On one ADB-funded SH section now under construction, there are safety issues related to the poor standards of warning signs and diversion schemes, and the general layout of the work sites.	In the sample villages, the road improvements had resulted in an increase in motor vehicle traffic and a rise in accidents, but also increasing awareness of the road safety issue and the vulnerability of villagers.
Resettlement and rehabilitation	A total of 3,896 persons, 107 houses (wholly or partly), and 223 shops (wholly or partly) were affected by the project. A total of 105.46 hectares of land was acquired for the construction of toll plazas, rest areas, and other uses. Compensation has been paid to all those affected, including some	Despite assurances to ADB from Madhya Pradesh (MP) state government officials that no encroachments or other structures would be dismantled before the award of civil works contracts, local villagers said that more than 75 small-business structures along one of the improved SHs were	In all villages affected by rural road improvements, small parcels of private land were annexed by the Government for the roadworks, with no prior consultation. The "voluntary donation of land principle," which formed the basis of the scheme, was not followed, and no land donation declaration

Socioeconomic Parameters	Road Type		
	National Highways	State Highways	Rural Roads
	“squatters” (encroachers). The compensation paid was reputedly less than the current market value of the land.	affected. The majority of the structures belonged to squatters running small enterprises, who were not compensated for their losses and who were also fined for operating shops on the revenue land.	was signed between the Government and the private landowner to legalize the “donation.” This situation applied to all Pradhan Mantri Gram Sadak Yojana roads, whether funded by ADB or by others. Villagers’ grievances related to the process and lack of consultation, since they declared a higher need for the road than the land.
HIV/AIDS and trafficking	Stakeholders confirmed the prevalence of commercial sex activities along the NHs, operating mainly from the <i>dhabas</i> frequented by the truckers. Despite these risks, the ADB project had no provision or strategy for promoting HIV/AIDS awareness. Similarly, no initiatives have been undertaken or are ongoing in the area related to HIV/AIDS awareness promotion by the Government, state authorities, or nongovernment agencies.	Stakeholders on all three SHs indicated awareness of HIV/AIDS, gained from public information messages on television and radio. Local health agencies have done little to generate HIV/AIDS awareness or disseminate information. Commercial sex activities are prevalent along sections of the SHs and deaths from HIV/AIDS have been reported. The MP government had conducted very few HIV/AIDS awareness campaigns and no such activity is being undertaken as part of the ADB project.	Regarding HIV/AIDS information, programs, and campaigns, little work has been done by the state health departments, and there is generally a low level of awareness in the communities, although the study consultations elicited some concern about future risks as traffic on the improved roads increases. The study found no instances of human trafficking in the communities.
Poverty - Effects on poor households	General indicators suggested improvements in the economic status of local communities, e.g., <ul style="list-style-type: none"> - opening of new enterprises with new job opportunities for locals; and - an increase in deposits and loans at local banks. Improved access to social and health services most directly benefited the poorest ^a groups by shortening travel time and thus expanding opportunities to gain access to these services. Other benefits to the poor included: <ul style="list-style-type: none"> - increased opportunities for those dependent on wage labor to seek employment in nearby towns, and more opportunities to commute between the workplace and villages, as a result of better transport services or better traveling conditions; and 		The rural road improvements contributed to significantly reducing the human and social poverty aspects by improving the access of the local communities to socioeconomic and other opportunities. The poorest ^b families in villages with improved roads did not benefit directly from the economic opportunities created by the improved connectivity. The improved access to social and health services has benefited the poor groups by giving them better access to economic opportunities outside the confines of the villages. However, work opportunities for the poor are mostly limited to daily wage labor works in agriculture, although some poor women were employed short-term on the roadworks under the EGS. The poor also spend more on transport now than before.

Socioeconomic Parameters	Road Type		
	National Highways	State Highways	Rural Roads
	<p>- possibility of more local employment and better wages in the village as a result of the increase in commercial enterprises in the area, as well as the expected future economic growth of the village.</p>		
Other effects	<p>Toll tax for local communities: The RRP indicated that the tolls would not cover local traffic. But in some areas without service roads, villagers are being charged each time they use the NHs to access their fields. Complaints to NHAH have been unfruitful.</p> <p>No plantation: Some trees cut during the road reconstruction have not been replaced.</p> <p>No bus shelter: A bus stop/shelter demolished during the project has not been replaced, so that those waiting for buses must wait by the roadside, exposed to all types of weather.</p> <p>Working conditions at toll plaza: Toll collection workers are exposed to high levels of pollution from idling commercial vehicles, work long shifts day and night, and have limited basic facilities (safe drinking water, toilets, etc.)</p>	<p>Labor conditions in road construction: Despite assurances to ADB from the MP state government that civil works contractors would comply with all laws, the study found that workers were paid less than the current (2004) minimum wages of Rs66/day, with men receiving Rs55/day and women Rs50/day. Also, some local temporary workers were not paid at all. Workers on road and bridge sites were also not provided with any protective clothing, boots, helmets, etc.</p> <p>Construction-related grievances: Local villagers have not received payment from subcontractors for their own labor and for the use of their tractors for roadworks. Local villagers are concerned about the potential effects of the elevation of the new SHs above some villages on flooding of homes and safety issues.</p>	<p>Enterprise development: The road improvements have increased the investment pattern in many affected villages, with locals having started private shops, other small enterprises and businesses, and banks in the villages.</p> <p>Essential services and government programs: Most government services and programs were available in most sampled villages before the road improvements but in one location there was a change in some essential services, with gradual improvement in water supply and sanitation practices.</p> <p>New technology: Improved connectivity has enabled villagers to travel more widely and increase exposure to new technology. Telephones (landlines, call boxes, and mobile services), radios, and TVs have been introduced in most areas following the road improvements.</p>

^a "Poor", mainly the landless and those engaged in wage labor, and living in *kutchra* (nonpermanent) shelters. Although the above benefits were available, they have not really improved the economic status of the poor. Since most of them are unskilled and illiterate, they are not considered qualified for jobs with the new enterprises that have come into the area, namely, motels, hotels, and petrol pump stations, and are thus limited to daily wage labor works in agriculture or at construction sites.

^b "Poor", mainly the landless and those engaged in wage labor, and living in *kutchra* shelters. In rural areas, they are mostly also from scheduled tribes and backward classes, have large families, are illiterate, and have average incomes of less than Rs23,000, 60% of which is spent on food.

Source: Operations Evaluation Mission.

6. **National Highways.** For the lowest-income groups, because of the absence of investment resources, the national highways did not act as a socioeconomic change agent. The economic benefits and opportunities created by the national highways increased growth and investment opportunities for the more well-off groups by increasing asset value, reducing transportation times and vehicle operating costs, and facilitating trade and business opportunities. On the national highways, evidence was found that people living in other urban areas were investing in rural areas along the upgraded highway, thus obtaining economic benefits from the project. These findings suggest that the likely impact of national highway projects is substantial but that the impact on reducing poverty at the local level has been somewhat less than expected (Box A12.1).

**Box A12.1: Macro vis-à-vis Micro Impacts of National Highways
—The Case of Surat-Manor Tollway on NH8**

Change in Credit Patterns	Dwindling Small Businesses
<p>The Dhanu Road Janta Cooperative Bank has a branch in the area adjacent to the NH8. The rehabilitation of the road facilitated the increased business for the bank—both loans and savings deposits. The project had a positive influence on the credit patterns of people.</p> <p>Unlike in the past, when loans were largely taken for investments in agriculture, the bank now gives loans for medium enterprises, small businesses such as auto rickshaws and trucks, hotel and petrol pump construction, and workshops.</p> <p>The bank has increased its coverage to a radius of 7–8 kilometers and has been operating for the last 4 years, i.e., during project implementation. The bank has total deposits of about \$5.5 million, and credit disbursements of \$3.3 million.</p>	<p>For the last 20–25 years, Jaylal Bhai has run a garage and a small restaurant near Charoti Toll Plaza (on the NH8).</p> <p>Jaylal believes the new dual-carriageway road to be “both a boon and a bane” for the local communities and businesses. The project improved connectivity by decreasing travel time as well as vehicle operating costs. However, it adversely affected the local small businesses, as fewer passengers and vehicles now stop at his restaurant on the way to Mumbai. The remaining customer base has been taken away by the newly constructed big hotels and restaurants, which have been developed in the area and are run by businessmen from other districts and states.</p> <p>Before the project about 100 vehicles used to stop daily in Jaylal's garage, because of the poor condition of the highway. Now the number has decreased to 3–4 vehicles a day because the through traffic using the NH does not stop in the village. This has adversely affected Jaylal's income. Many others like him have also seen their business decline with the new road.</p>

7. **State Highways.** On the state highways, the broad findings of the socioeconomic study in Madhya Pradesh indicated that the impact of the road improvement on local communities was similar to that of the national highways with a few differences. Table A12.3 provides specific examples of these impacts. Before the Multai-Chindwara state highway was improved, traditional untrained *dais*⁴ used to attend child births in most of the villages in the vicinity of the state highway. Now, most childbirths take place in local hospitals. In the case of the Khandwa-Harda state highway, village discussions indicated that the improvement of the state highway contributed to a reduction in maternal deaths during pregnancy because of better access to medical assistance. The state highway improvement also affected land prices in the area (Table A12.4). After the road was completed, land prices generally doubled or tripled. In only one village was the price of agriculture land constant.

⁴ Traditional midwives in villages.

Table A12.3: Impact of State Highways Improvement on Travel Cost, Time, and Frequency of Bus Service

Name of the State Highway	Name of Village	Destination	Travel Cost/Fare (rupees)		Travel Time (minutes)		Daily Frequency of Bus Service (number)	
			Before Project	After Project	Before Project	After Project	Before Project	After Project
Multai-Chindwara SH	Donava Village	Betul Multai Chindwara	Betul - Rs40	Betul - Rs42	2.30 hr	1.30 hr	5 buses and 1–2 trucks	10 buses and 8 trucks
			Multai - Rs15 Chindwara - Rs30	Multai - Rs17 Chindwara - Rs32	1 hr	0.30 hr		
	Lava Ghogri Village	Chindwara	Rs15	Rs17	1 hr	0.30 hr	4 buses	10 buses
	Temni Khurd Village	Chindwara	Rs15	Rs17	1hr	0.30 hr	3–5 buses	10–12 buses
Multai		Rs17	Rs20	2.30 hr	1 hr			
	Parasiya Village	Chindwara	—	—	—	—	5 buses and 1–2 trucks	10 buses and 8 trucks
Harda-Khandwa SH	Rajpur Village	Khandwa	Rs13	Rs15	1.30 min	0.30 min	20 buses and 30 trucks	100 buses and 400 trucks
	Ashapur Village	Harsud	Rs15	Rs25	45 min	30 min	25 buses and 30 trucks	100 buses and 350 trucks
	Pokharni Village	Khandwa	Rs30	Rs42	3 hr	1.45 hr	20 buses and 40 trucks	75 buses and 400 trucks
	Nahalda Village	Harda	Rs25	Rs45	1 hr	0.30 hr	20 buses and 30 trucks	100 buses and 400 trucks
Khandwa – Icchhapur SH	Raheepura	Burhanpur	Rs4	Rs5	0.20 hr	0.10 hr	200 buses and trucks	400 buses; also trucks
	Icchhapur	Burhanpur	Rs10	Rs13	1.45 hr	1 hr	400 buses, trucks, and scooters	1,000 trucks and scooters
	Peeparhati	Pandana	Rs10	Rs15	2 hr	1 hr	200 buses and trucks	400 buses and trucks

hr = hour, Rs = rupees, SH = state highway.
Source: Operations Evaluation Mission.

Table A12.4: Land Values near the State Highway

Village Name	Land Value per Acre (\$ per acre)	
	Before Project	After Project
1. Multai-Chindwara SH		
Donara	550	2,200
Lava Ghorl	1,176	2,200
Temni Khurd	1,320	2,200
	(along the road)	(along the road)
Mainikhapa	1,540	2,200
Parasiya	880	2,200
2. Harda-Khandwa SH		
Rajpur	550	2,200
	(agricultural land)	(agricultural land)
Ashapur	8,800	No change
Pokharni	1,100	2,200
Nahalda	1,650	3,300
3. Khandwa-Icchapur SH		
Raheepura	3,740	6,600
Ichhapur	1,100	3,300
Peeparhati	1,100	3,300

SH = state highway.

Source: Operations Evaluation Mission.

8. **Rural Roads.** The study found a positive correlation⁵ between road improvements and enhancement of the socioeconomic status of the villagers in the communities through:

- (i) better access to employment opportunities via improved connectivity (improved roads and new or better road transport services) to other villages, towns, and cities (Table A12.5);
- (ii) more local employment and better wages in the villages as a result of the increase in commercial enterprises and economic growth in the village;
- (iii) increase in deposits and loans at the newly-established local bank offices;
- (iv) decline in infant mortality rate and maternal mortality rate as a result of improved access to medical facilities, enabling trained medical practitioners to attend more births;
- (v) decreases in the dropout rate from primary and middle schools and an increase in girls traveling outside the villages for high school and college education;
- (vi) better prices for farmers through direct sales of agricultural crops at *mandis* (local markets) instead of via middlemen, thereby improving the farmers' profit margins; and
- (vii) easier travel for the poorest groups (men and women) outside the villages in search of work opportunities in larger urban areas (Box A12.2).

⁵ These findings are based on primary data collected by the evaluation team.

Box A12.2: Impact of Rural Road Improvement

Six of the 14 villages covered by the Operations Evaluation Mission survey did not have any public transport provisions, such as government or private bus or minibus service, before the road construction. After the rural road construction, bus service (privately operated services) began in five of the six sample villages. In other villages with existing bus services, there were improvements in the frequency of bus service. For instance, in Hiwarkhed district of Prabhatpattan block in Betul, no buses served the village before the road was built; now there are 10 buses from the village to the district center. The road construction has led to enhanced accessibility for the local rural communities to socioeconomic services such as health centers, markets, and employment opportunities by reducing the travel time by 50% or more in most cases.

In terms of travel cost, road improvement has had a mixed impact. The new travel fare is lower than the previous fare in Jeonara and Barodmal villages because of the decline in vehicle operating costs. However, this has not been a uniform phenomenon in all the villages. The fares were increased in other villages, despite anticipation of lower fares. Appendix 10 provides more details on these indicators.

Source: ADB. 2002. *Impact of Rural Roads on Poverty Reduction: A Case Study-Based Analysis*. Manila.

9. From the data collected by the study, the rural road projects are likely to have a very substantial impact.

10. The most significant findings of the socioeconomic study were that, although the road infrastructure improvements have contributed to reducing human poverty in the project areas by improving access to economic opportunities and social services, the income effects among the poorest groups have been limited. Another Operations Evaluation Department study⁶ found that although the poor have benefited substantially from social impacts through improved access to transport services, they have not been able to capture all the economic benefits from transport cost savings because of their indebtedness to traders and the lack of competition on transport routes.

11. The evaluation team found limited effective implementation of the objectives in the ADB-funded projects aimed at addressing social issues such as the spread of HIV/AIDS, transport safety, trafficking of women and children, and livelihood programs for poor communities in project areas. The country strategy and program stated that road investments would be designed to be socially-inclusive projects. The relevant features included enforcement of better safety standards; education of truck drivers, a high-risk group, on HIV/AIDS; containment of trafficking of women and children; and livelihood projects for resettled communities. The evaluation team found very little effort to address these issues, including a lack of monitoring of progress, or the lack thereof, in achieving the intended outcomes. While attempting to design road projects to achieve inclusive social objectives is, on paper, clearly desirable, it must be questioned whether road projects are the most efficient means of achieving such objectives. Agencies responsible for designing, implementing, and maintaining roads are not responsible for HIV/AIDS education or combating the trafficking of women and children.

⁶ ADB. 2002. *Impact of Rural Roads on Poverty Reduction: A Case Study-Based Analysis*. Manila.

**Table A12.5: Impact of Rural Road Improvement
on Travel Cost, Time, and Frequency of Bus Service**

Village	Block	Travel Cost/Fare (rupees) and Destination		Travel Time (min)		Daily Frequency of Bus Service (number)	
		Before Project	After Project	Before Project	After Project	Before Project	After Project
A. Betul District							
Malegaon	Bhainsdehi	No bus service	Betul - Rs25	180 min	90 min	No bus	1 bus
Goregaon	Bhainsdehi	No bus service	Jhallar - Rs7 Betul - Rs25	Jhallar - 40 min Betul - 180 min	Jhallar - 20 min Betul - 90 min	No bus	2 buses
Kordi	Bhainsdehi	No bus service	Jhallar - Rs23	60-80 min	30 min	No bus	1 bus
Hiwerkhed	Prabhatpattan	No bus service	Multai - Rs15		30 min	No bus	10 buses
Tiwerkhed	Prabhatpattan	Multai - Rs10	Multai - Rs18	60 min	30 min	1 bus	2 buses
Berul Bazar	Prabhatpattan	Multai - Rs6	Multai - Rs10	60 min	40 min	1 bus	4 buses
B. Seoni District							
Jeonara	Kiolari	Seoni - Rs30	Seoni - Rs25	90 min	25 min	1 bus	5 buses (govt and pvt)
Pandiwara	Kiolari	Sarekha - Rs15	Sarekha - Rs15	90 min	30 min	1 bus	1 bus
Ratanpur	Kiolari	Sarekha - Rs5	Sarekha - Rs5	45 min	25 min	1 bus	2 buses
Barodmal	Ghansore	Mehta - Rs30	Mehta - Rs25	60 min	20 min	1 bus	1 bus
Ishwarpur	Ghansore	Durgapur - Rs3	Durgapur - Rs5	30 min	10 min	1 bus	1 bus
Ghotkhera	Ghansore	Kapurpar	Kapurpar	40 min.	40 min.	NIL	NIL
C. Harda District							
Bicchapur	Timarni	No Bus service	To SH - Rs5	90 min	25 min	No bus	1 bus
D. Dewas District							
Manasa	Sonkatch	Bisakedi - Rs2	Bisakhedi - Rs2	30 min	10 min	1 bus	2 buses

hr = hour, min = minute, Rs = rupee, SH = state highway.

Source: Operations Evaluation Mission.

EVALUATION FINDINGS OF OTHER MULTILATERAL AGENCIES

1. A recent evaluation by the World Bank's Independent Evaluation Group identified several issues specific to the Indian transport sector and suggested broad recommendations for the World Bank's future assistance (Box A13).

Box A13: Independent Evaluation Group – Issues and Recommendations for the Transport Sector

A. Issues

Recent World Bank evaluation identified the following issues for the design of future Bank assistance in India: (i) the adoption of appropriate design standards and financial mechanisms for the national highway program, which assumes a very large component of PPPs; (ii) the need for better integration of rural roads into the state's road networks; (iii) the means to continue a dialogue with the railways and eventually resume lending; and (iv) the achievement of an appropriate transport portfolio mix, to ensure that it maximizes the Bank's impact. The most critical question is the future of urban transport support, where needs are huge and potential rewards high, but projects are complex and resource intensive.

B. Recommendations for the World Bank's Transport Sector

1. Ensure that the focus of the Bank's transport operations goes beyond intercity highways and gives more attention to issues of growing urgency, including environmental damages, energy efficiency and climate change, traffic congestion, safety, affordability, and trade.
2. Prepare a Bank Group transport strategy with a sixfold emphasis: (i) greater attention to air and water pollution and realizing environmental gains; (ii) achieving greater synergies across relevant sectors—building on the merging of the Bank's ESSD and Infrastructure Networks; (iii) enhancing knowledge sharing and analytical and advisory services and their contribution to country strategies; (iv) continuing to support private sector participation through close coordination among the Bank, IFC, and MIGA; (v) increasing attention to governance and corruption issues; and (vi) redeploying staff and budget resources accordingly.
3. Build up the sector's monitoring and evaluation efforts and align them with the new strategy, including through (i) the development over the next year of relevant intermediate indicators applicable to the broad range of projects; (ii) the launching of an enhanced program of rigorous impact evaluations for selected programs; (iii) a comprehensive self-evaluation of the experience with SWAPs within 3 years; and (iv) an independent overview of the SSATP Program within 2 years.

ESSD = Environmentally and Socially Sustainable Development (Network), IFC = International Finance Corporation, MIGA = Multilateral Investment Guarantee Agency, PPP = public-private partnership, SWAP = sector-wide approach, SSATP = Sub-Saharan Africa Transport Policy Program.

Source: The World Bank. 2007. *A Decade of Action in Transport: An Evaluation of World Bank Assistance to the Transport Sector, 1995–2005*. Independent Evaluation Group. Washington, DC. Available: http://siteresources.worldbank.org/EXTTRANS/Resources/transport_eval.pdf

PHOTOGRAPHS

Photo A14.1: Surat-Manor Toll Station



Photo A14.2: Surat-Manor Weigh Station



Photo A14.3: Madhya Pradesh State Highway Construction 1



Photo A14.4: Madhya Pradesh State Highway Construction 2



Photo A14.5: Safety during Construction



Photo A14.6: Safety during Construction

