



Validation Report

Reference Number: PVR-359
Project Number: 32253
Loan Number: 1944
December 2014

India: East–West Corridor Project

Independent Evaluation Department
Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
BOT	–	build–operate–transfer
EIRR	–	economic internal rate of return
km	–	kilometer
NHAI	–	National Highways Authority of India
NHDP	–	National Highways Development Project
O&M	–	operation and maintenance
OMT	–	operate–maintain–transfer
PCR	–	project completion report
PIU	–	project implementation unit
PPP	–	public–private partnership
RRP	–	report and recommendation of the President
TA	–	technical assistance
VOC	–	vehicle operating cost

NOTE

In this report, “\$” refers to US dollars.

Key Words

adb, asian development bank, bot, india, nhai, performance evaluation, ppp, project completion report, road maintenance, transport, vehicle operating cost

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PROJECT BASIC DATA

Project Number:	32253	PCR Circulation Date:	Oct 2012	
Loan Number:	1944	PCR Validation Date:	Dec 2014	
Project Name:	East–West Corridor Project			
Country:	India		Approved (\$ million)	Actual (\$ million)
Sector:	Transport and ICT	Total Project Costs:	575.80	644.20
ADB Financing: (\$ million)	ADF: 0.00	Loan:	320.00	320.00
		Borrower:	210.70	260.30
	OCR: 320.00	Beneficiaries:	0.00	0.00
		Others (Private Sector):	45.10	63.90
Cofinancier:		Total Cofinancing:	0.00	0.00
Approval Date:	26 Nov 2002	Effectiveness Date:	90 days after loan agreement was signed	19 Nov 2003
Signing Date:	25 Aug 2003	Closing Date:	31 Dec 2006	24 Aug 2009
Project Officers:	S. Tsukada N Zhang N. Patel T. Nakazaki N. Zhang T. Nishimura A. Motwani	Location: ADB headquarters ADB headquarters ADB headquarters ADB headquarters ADB headquarters ADB headquarters India Resident Mission	From: Dec 2002 Jun 2003 Aug 2004 Mar 2005 May 2006 Aug 2006 Jan 2007	To: May 2003 Jul 2004 Feb 2005 Apr 2006 Jul 2006 Dec 2006 Dec 2009
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ADB = Asian Development Bank; ADF = Asian Development Fund; ICT = information and communication technology; IED1 = Independent Evaluation Department, Division 1; IED2 = Independent Evaluation Department, Division 2; OCR = ordinary capital resources; PCR = project completion report.

I. PROJECT DESCRIPTION

A. Rationale

1. India's national highway system, at the time of project preparation, suffered from chronic capacity shortage as 2% of the country's 58,000 kilometer (km) network carried 40% of the road's traffic. The national highways were in poor condition with an international roughness index of 4–7 meters per km. Of these national highways, 38% had one lane, 59% had two lanes, and 3% had four or more lanes. Nearly half of these roads were seriously congested, with volume capacity ratio of more than 1.3. With India's rapid economic expansion in the last 10

years at the rate of 6%–7%, inadequate highway capacity has seriously threatened the continued expansion of the national economy.¹

2. The National Highways Authority of India (NHAI) initiated the National Highway Development Program (NHDP) in 1998 to ease chronic capacity constraints by upgrading key arteries of the national highways network. The project, which this validation is reviewing, was the third loan financed by the Asian Development Bank (ADB) for the multiyear lending program for NHDP. The NHDP upgraded into four lanes the following highway corridors: (i) corridor connecting the major metropolitan cities of Delhi, Mumbai, Chennai, and Kolkata—known as the golden quadrilateral; (ii) north–south corridor connecting Srinagar to Kanyakumari (4,000 km); and (iii) east–west corridor that connects Silchar to Porbandar (3,300 km).

B. Expected Impact

3. The project's envisaged impact was to contribute to sustainable economic growth. The impact indicator was reduced freight cost for trucking service by 20% (in constant price base) before and after NHDP completion. This validation is of the view that this impact indicator can also be an outcome indicator.

C. Objectives or Expected Outcome

4. The project's expected outcomes were (i) NHAI transformed into a lean and efficient highway management organization, (ii) reduced capacity constraints of the east–west corridor, (iii) enhanced public–private partnership (PPP) through build–operate–transfer (BOT) and other private sector investments, and (iv) strengthened capacity of NHAI to deal with emerging social issues.

5. The corresponding outcome indicators were (i) having a maintenance ratio of less than 5 staff per 100 km of highway, (ii) four-lane highways in the east–west corridor increased from 5% to 90% by 2007, and (iii) PPP development at the east–west corridor increased from 0% to 5% by 2007. No performance indicator was set for the planned capacity strengthening of NHAI. This validation notes that the above targets for four-lane highways and PPP proportion were actually output targets for the entire east–west corridor, rather than for the project, which covered only a portion (3.6 km) of the entire corridor (503.6 km). This validation considers these as proxy indicators for the overall NHAI capacity development. However, examining the project activities and funding, it is unclear how these outcomes can be attributed to the project since its capacity-building activities were limited to dealing with emerging social issues (para. 6).

D. Outputs

6. The project had three outputs. The first was the rehabilitation and widening of 468.3 km two-lane highways into dual, two-lane carriageways with various road safety features. The six sections, once constructed, were to be operated and maintained by private sector contractors under agreements with NHAI. The second output was the preparation of the BOT package for the 99-km section between Jetpur and Bamanbone. The third was to strengthen the capacity of NHAI to deal with social issues, such as grievance handling, stakeholder participation,

¹ ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to India for the East–West Corridor Project*. Manila.

HIV/AIDs, resettlement, and road safety. The last output has no indicator and essentially the same as the abovementioned outcome indicator.²

E. Provision of Inputs

7. The total cost of the project at the time of approval was \$575.8 million, with \$530.7 million for the public sector portion and \$45.1 million for private sector participation. The actual cost was \$644.2 million, which was 11.9% higher than the appraisal estimate due to fluctuations in the exchange rate. In particular, civil works increased by \$102.5 million for the public sector portion in view of price escalation under the contracts and exchange rate fluctuations. Most of the funds were to be used for civil works and engagement of consultants for institutional strengthening study, training, and development of a cash flow model. As planned during appraisal, the third output—strengthening NHAI capacity to deal with emerging social issues—was largely funded by an advisory technical assistance (TA), Enhancing the Corporate Finance Capacity of NHAI. The TA loan was approved in conjunction with the Western Transport Corridor Project,³ but its scope was modified since its original scope was being implemented by a World Bank project. The project completion report (PCR) reported that the TA loan implementation was *satisfactory*.

8. The project was to be financed by an ADB loan of \$320 million (55.6% of the project cost), with government funds of \$210.7 million (36.6%) for the public sector portion, and private sector contribution of \$45.1 million (7.8%) for the BOT component. At completion, ADB financed \$320 million (49.7%) of the project cost, the government funded \$260.3 million (40.4%), and the private sector financed \$63.9 million (9.9%). Disbursement progress was slow during the initial period due to a delay in procurement. Disbursements accelerated in 2006 and 2007 as progress was achieved in civil works implementation. The full loan amount was disbursed in 2009.

9. The project was classified Category B under the ADB environmental categorization requirements. The initial environmental examination was prepared for the sections of the Porbandar–Deesa stretch that form part of the east–west corridor. The project was deemed unlikely to have significant adverse environmental impacts since the roads to be upgraded involved minor realignments and two bypasses, and was not traversing through environmentally sensitive areas. A full environmental impact assessment under ADB guidelines was not required. The PCR reported that the project’s environmental management plan was appropriately implemented.⁴ Adequate drainage measures were constructed to avoid water logging and reduce soil erosion. During implementation, the exceptionally heavy rainfall, not experienced in the last 2 decades, caused high damages to high embankment shoulders.

10. A preliminary assessment report on indigenous peoples at appraisal indicated that the project will not specifically impact on tribes living in the project areas. A separate indigenous peoples’ development plan was not required since they were already integrated into the mainstream communities. A summary poverty reduction and social strategy was prepared.

² The design and monitoring framework actually had a fourth output to equip NHAI with (i) adequate funds for NHDP development, (ii) an arm’s-length relationship with line ministries, and (iii) separate line of business for operation and maintenance (O&M). But this output was not included in the RRP and PCR texts and was not monitored.

³ ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to India for the Western Transport Corridor*. Manila.

⁴ ADB. 2012. *Completion Report: East–West Corridor Project in India*. Manila.

11. At appraisal, 2,526 households and businesses (comprising 13,064 individuals) were expected to require relocation assistance. About 1,000 informal settlers and small business enterprises were to be relocated (report and recommendation of the President [RRP], para. 42). During implementation, 3,777 families, including those holding land titles, were affected by the project. Also to be relocated during project implementation were 218 common property resources, such as schools, religious structures, bus stops, and wells, among other things. The PCR indicated that the involuntary resettlement did not put the affected individuals into a disadvantaged position (PCR, para. 41). Payments were made to the affected persons, based on the resettlement plan, prior to the commencement of civil works. However, payment to some of the affected persons was delayed due to land disputes in the family, difficulty in locating some of the entitled persons, the presence of leaseholders, and the lack of documentation for land transfers. In due course, payments were made to all affected persons.

12. At completion, the total cost of land acquisition and resettlement was Rs456.7 million (\$9.39 million). This was much higher than the resettlement budget of Rs34.29 million (\$0.7 million), which was to include all costs related to land acquisition and resettlement, such as compensation and resettlement assistance, nongovernment organizations' services, among other things (RRP, para. 20). The RRP also indicated a different estimate of the resettlement cost, which was Rs434.0 million (\$8.97 million) (RRP, para. 45). However, the PCR did not discuss the reasons behind the variances in costs and in the number of affected households and businesses.

13. For consulting services, 7,051 person-months were provided for the supervision of civil works, comprising 531 person-months of international consulting services and 6,520 person-months of national consulting services. An advisory TA, which was attached to another project,⁵ was utilized to strengthen the NHAI capacity on financial management and in addressing issues related to grievance handling, stakeholder participation, HIV/AIDS, resettlement, and road safety. The TA loan was rated *successful*.

F. Implementation Arrangements

14. The NHAI was the executing agency for the project. Two project implementation units (PIUs) were to implement the project. The PIU office at Rajkot was responsible for the highway sections from Porbandar to Garamore, including the BOT section. The PIU office at Palanpur was responsible for the highway sections from Garamore to Deesa. The PCR indicated that the PIUs were not fully staffed in the early stages of project implementation, but these were subsequently strengthened. The PIUs were headed by the project directors, who were supported by project managers, administrative staff, and supervision consultants. The PCR noted that regular meetings were conducted by the NHAI chairperson and the chief general manager for monitoring project implementation. Separate financial accounts were established in each PIU. This validation finds the implementation arrangements by the government to be appropriate.

15. The project complied with all of the loan covenants, including the submission of audited financial reports to ADB on a regular basis. However, some of the submissions were delayed for 2–5 months from the stipulated period of 6 months after closure of the financial year. The covenant on the updating of the resettlement plan was deemed not required during

⁵ ADB. 2001. *Technical Assistance to India for Enhancing NHAI's Corporate Finance Capacity*. Manila. The amount of \$700,000 for TA 3724-IND was approved in 20 September. This TA loan was attached to Loan 1839-IND.

implementation. The Environmental and Social Development Unit of NHAI implemented both the resettlement plan and environmental management and monitoring plan for the project.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

16. The PCR rated the project *highly relevant* to the government's development objectives and to the ADB country strategy and program. It indicated that the project was an integral part of the government's strategy on developing a national highway network under its NHDP program, which ADB had been supporting through a programmatic approach (para. 2). To achieve an economic growth rate of 8% annually, the government's Tenth Five-Year Plan, 2002–2007 (Tenth Plan) noted that private sector and infrastructure development, among others, were key to increasing efficiency. ADB and the World Bank supported the establishment of the NHAI in February 1995. This validation assesses that the project was in line with the country's development priorities and with ADB country and sector strategies.

17. The PCR indicated the need for a thorough survey, investigation, and design during the initial stages to enhance project readiness. This was largely due to the engineering problems encountered during the construction of Surajbari Bridge, which significantly delayed project completion (PCR, para. 49). It also indicated that the resettlement plan should clearly indicate the location-specific rationale for the land acquisition from social, technical, and road safety perspectives to facilitate the consultation process. These deficiencies in project readiness at entry implied weaknesses in the project's design. On these bases, this validation rates the project *relevant*.

B. Effectiveness in Achieving Project Outcome and Outputs

18. The PCR rated the project *highly effective*. In assessing the outputs, the PCR reported that 468.3 km of national highways along the east–west corridor had been upgraded through widening and improvement. Another 35.2 km of highway was financed by the private sector. The rehabilitation of the project highway substantially improved connectivity in the northwest areas of Gujarat state. After project completion, traffic on the project highways increased by more than 10% per year. Also, the average vehicle speed increased at 60–80 km per hour, compared with 40–50 km per hour before the project. The PCR, however, did not present information on the quality of the roads that were improved. This validation notes that the envisaged output for the public sector portion was achieved.

19. Both project frameworks of the RRP and PCR indicated that the Jetpur–Bamanbore (99 km) section was to be developed and managed under a BOT scheme. Also, the corresponding output indicator indicated that the entire BOT section was to be operational by the end of 2006. The main text (PCR, para. 7) also indicated that 36 km were built at completion. The PCR reported that another 32 km was expected to be combined with the 36 km under a 20-year BOT contract. On the whole, the BOT did not realize the envisaged length of 99 km, but it helped catalyze public–private participation in the east–west corridor.

20. Outcome indicators were essentially reflection of the progress in NHAI capacity building. At completion, NHAI managed to mobilize resources to upgrade 72.2% (2,628 km of 3,640 km) of the total east–west corridor to four-lane highways as compared to the original target of 90%. However, NHAI achieved 14% of PPP development for the entire corridor, as compared to the target of 5%. As mentioned in para. 5, these were not very good outcome

indicators as progress in widening the highway for the entire corridor and the realization of PPP targets can be attributed to many other factors and projects, beyond interventions of this project.

21. The third expected outcome was the transformation of NHAI into a lean and efficient highway management organization with a ratio of 5 staff per 100 km of highway as a performance indicator. The PCR reported that this target was achieved at loan closing. The fourth expected outcome of a strengthened NHAI capacity in dealing with emerging social issues had no performance indicator at appraisal. The capacity-building work was done under an advisory TA (para. 13) and the TA loan was completed satisfactorily.⁶ Another progress indicator available was the impact indicator of lowering vehicle operating cost (VOC) by 20% on the improved road. This target was achieved and can complement other outcome indicators. Based on the assessment of outcome and output achievements, this validation rates the project *effective*.

C. Efficiency of Resource Use in Achieving Outcome and Outputs

22. The PCR rated the project *efficient*. It reestimated the economic internal rate of return (EIRR) for the project at 17.5%, which was lower than at appraisal (22%) but above the threshold of 12.0%. This was attributed to the longer implementation period. However, this validation notes that an additional 20% benefit was added to the VOCs and the travel time savings. This addition was to capture other benefits, such as health expenditure savings from accident reduction, ease of access for road users to services (e.g., health, education), benefits to local businesses, and lower freight damages. This validation also notes that the EIRR estimation included a recovery value for the road upgrading at about 50% of the project's total capital cost at the last year of the economic analysis as benefit. This amount was large (after 20 years) as to significantly affect the EIRR estimate. Both these assumptions were rather arbitrary and needed better justifications.⁷

23. The PCR indicated that the project closing was almost 3 years behind schedule, which adversely affected its efficiency. At appraisal, the project was envisaged to be implemented over 48 months, inclusive of procurement and preconstruction activities, and was expected to be completed by 30 June 2006. It also indicated that although ADB approved advance procurement action, the prequalification of contractors and the bidding process took much longer than envisaged at appraisal due to procedural delays. As such, 5 of the 6 contract packages were delayed beyond the contractual completion dates. All civil works packages were substantially completed by August 2009, except for Surajbari Bridge, which was finished about 3 years later than anticipated due to engineering problems. This validation rates the project *less than efficient*.

D. Preliminary Assessment of Sustainability

24. The PCR rated the project to be *likely sustainable*. The recalculated financial internal rate of return (FIRR) was 7.8%, compared with 8.2% at appraisal. This reestimated FIRR was higher than the 4.2% weighted average cost of capital. The financial reevaluation seemed to involve the combined public and private sector portions of the upgraded roads. The PCR

⁶ ADB. 2013. *Technical Assistance Completion Report. Enhancing the Corporate Finance Capability of National Highway Authority of India* (TA 3724-IND). Manila.

⁷ This validation recalculated the EIRRs without the additional 20% benefits and residual values of 50% and 10%. The results were 15.2% and 14.9%, respectively.

indicated that the reevaluation used the average actual highway toll revenues of the BOT and the operate–maintain–transfer (OMT) concessionaires. These concessionaires are to be responsible for toll collection, and the operation and maintenance (O&M) of the highway section for a period of 9 years and were to pay annual fees to NHAI (para. 6; PCR, Appendix 8, p. 27). The average actual O&M costs of the OMT concessionaires were considered in the reevaluation.

25. The PCR also indicated that routine highway maintenance is being undertaken by the concessionaires while periodic maintenance is to be undertaken either by the concessionaires that have the required engineering capability or by professional highway contractors. Each OMT concessionaire was required to carry out at least one periodic maintenance activity (mainly resurfacing) during its concession period. The NHAI regional office was to monitor the road roughness. Independent consultants were to monitor the O&M activities of OMTs and the cost of engaging these consultants was to be shared equally by the concessionaire and NHAI. Based on these observations, this validation rates the project *likely sustainable*.

E. Impact

26. The expected project impact was the promotion of economic growth with the easier and less costly movement of goods and people. A reduction in freight costs for trucking service by 20% was anticipated. At project completion, the PCR noted that the VOC for the project highways was reduced by 21%–25%, which should have helped lower passenger and freight transport costs. The Rajkot bypass, a BOT package, has facilitated local traffic flow and rapid socioeconomic development in the Rajkot area. The PCR noted that the project highway and roadside amenities, such as bus shelters, have improved connectivity to rural areas and have brought huge socioeconomic benefits. Several local public transport services have begun operating on project highways and serving local residents, particularly the poor. In general, the PCR indicated that the project resulted in initial socioeconomic impacts in the project area and is likely to have larger impacts in the next few years over a wider region. However, the PCR provided little supporting evidence of these economic impacts. Nonetheless, this validation rates the project impact *significant*.

III. OTHER PERFORMANCE ASSESSMENTS

A. Performance of the Borrower and Executing Agency

27. The PCR rated the performance of the borrower and the executing agency *satisfactory*. Two PIUs as envisioned were set up and regular meetings were conducted by the NHAI chairperson and the chief general manager for monitoring project implementation. NHAI worked closely with ADB to discuss factors that impeded the smooth implementation of the project and worked out specific measures to ensure speedy resolution of critical issues. NHAI and the PIUs provided the necessary assistance to all ADB missions. This validation rates the performance of the borrower and the executing agency *satisfactory*.

B. Performance of the Asian Development Bank

28. The PCR rated ADB performance *satisfactory*. Eight review missions were fielded, including a special loan administration review and a midterm review. Review mission reports indicated that ADB closely supervised implementation and worked closely with NHAI in providing timely advice on technical and contract administration matters. ADB approvals of documents at both processing and implementation stages (i.e., engagement of consultants and procurement of civil works) were made in a timely manner. ADB approved three requests

from the government for the extension of the loan closing date to facilitate project implementation. The role of ADB in providing prompt advice was well recognized by the government. This validation rates ADB performance *satisfactory*.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

29. The PCR rated the project *successful*. This validation likewise rates the project *successful* although there are lower ratings for project relevance, effectiveness, and efficiency. On relevance, deficiencies in project readiness reduced the project's relevance. On effectiveness, there was a marked shortfall in output in the BOT section. On efficiency, the project experienced considerable delays.

Overall Ratings

Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Relevance	Highly relevant	Relevant	Deficiencies in project readiness were noted (paras. 16–17).
Effectiveness in achieving project outcome and outputs	Highly effective	Effective	Major outcome indicators fell short of the targets (paras. 18–21).
Efficiency in achieving outcome and outputs	Efficient	Less than efficient	Lower rating is due to implementation delays and issues in assumptions used to estimate project economic viability (paras. 22–23).
Preliminary assessment of sustainability	Likely sustainable	Likely sustainable	
Overall assessment	Successful	Successful	
Borrower and executing agency	Satisfactory	Satisfactory	
Performance of ADB	Satisfactory	Satisfactory	
Impact	Not rated	Significant	See para. 26
Quality of PCR		Less than satisfactory	See para. 33.

ADB = Asian Development Bank, IED = Independent Evaluation Department, PCR = project completion report.

Note: From May 2012, IED views the PCR rating terminology of "partly" or "less" as equivalent to "less than" and uses this terminology for its own rating categories to improve clarity.

Source: ADB Independent Evaluation Department.

B. Lessons

30. The PCR identified a few important lessons. A project-readiness checklist and training and capacity-building programs for the executing agencies will ensure that preconstruction activities are carried out in advance and only well-prepared projects are taken up for approval. Separate contracts for major bridges should be entered into, whenever necessary, so that such contracts are awarded to qualified, specialized contractors. Criteria for the qualification of contractors under a joint venture, and for the award of multiple contracts, should be strengthened for future projects. Contractual provisions related to contractor performance, such as mobilization, staffing, and deployment of equipment and funds, need to be strengthened so that poor contractor performance is discouraged. This validation has no additional lesson to offer.

C. Recommendations for Follow-Up

31. The PCR recommended a benefit monitoring and evaluation study to fully assess and document the socioeconomic benefits and the lesson learned for incorporation in future projects. It also recommended the provision of training for the PIU staff before project activities are undertaken. This validation finds these recommendations appropriate, especially the importance of a project benefit monitoring and evaluation system, which should have started as soon as some highway segments were opened to motorists.

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Monitoring and Evaluation Design, Implementation, and Utilization

32. At appraisal, it was envisaged that NHAI was to monitor and evaluate project performance. The PCR did not indicate the extent to which monitoring of outcomes was routinely carried out, especially on the socioeconomic benefits being generated by the project. There were indications that routine data gathering of traffic counts and road fatalities were undertaken (PCR, Appendix 10). As noted in the efficiency assessment earlier, it was not clear if VOCs before and after the project were estimated. The VOC savings per vehicle kilometer, as used in the economic reevaluation, were adopted from similar projects in the area (PCR, Appendix 11, para. 3). However, the PCR indicated in the project framework that VOC was reduced by 21%–25%.

B. Comments on Project Completion Report Quality

33. The PCR quality is rated *less than satisfactory*. The PCR lacked substantial discussions and analyses on the evaluation criteria, especially on effectiveness. The project framework failed to clearly delineate the output and outcome indicators. The PCR did not sufficiently explain why indicators of proportion of four-lane highways and sections under BOT in the whole east–west corridor (para. 21) were used as outcome indicators. This caused confusion in validation as the project only worked on a much smaller portion of the corridor. It was also not very clear how the project outputs support the attainment of the expected outcomes. There was no discussion on how benefit monitoring was carried out.

C. Data Sources for Validation

34. Data sources for this validation included the PCR; RRP; the Country Strategy and Program: India, 2003–2004; and various reports of the review missions.

D. Recommendation for Independent Evaluation Department Follow-Up

35. The preparation of a project performance evaluation report may be undertaken after the full completion of the east–west corridor. An accurate assessment of the project's traffic and socioeconomic impacts could be made by then.