



Validation Report

Reference Number: PCV: IND 2008–13
Project Number: 29250
Loan Number: 1747
July 2008

India: Surat–Manor Tollway Project

Operations Evaluation Department

Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
NH	–	national highway
NHAI	–	National Highways Authority of India
O&M	–	operation and maintenance
OCR	–	ordinary capital resources
PCR	–	project completion report
RRP	–	report and recommendation of the President
TA	–	technical assistance

NOTE

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

Key Words

india, adb, asian development bank, roads, lessons, operations evaluation department, performance evaluation

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PROJECT COMPLETION REPORT VALIDATION

A. Basic Project Data		PCR Validation Date:		
Project and Loan/Grant Number:	29250 1747-IND		Approved	Actual
Project Name:	Surat–Manor Tollway Project	Total Project Costs (\$ million):	280.00	246.79
Country:	India	Loan/Grant (\$ million):	180.00	149.75
Sector(s):	Transport/Roads and Highways	Total Cofinancing (\$ million):		
ADB Financing (\$ million):	ADF:	Borrower (\$ million):	100.00	88.52
	OCR: 180.00	Beneficiaries (\$ million):		
Cofinanciers:		Others (\$ million):		
Approval Date:	27 Jul 2000	Effectiveness Date:	3 Jan 2001	8 Nov 2000
Signing Date:	5 Oct 2000	Closing Date:	30 Sep 2004	30 Sep 2005
Project Officers:	Name:	Designation:	From	To
	P. Vallely	Transport Specialist, IWTC	2000	2001
	N. Patel	Principal Project Management Specialist, SARD	2002	2002
	A. Akanda	Principal Transport Specialist, INRM	2002	2005
	A. K. Motwani	Project Implementation Officer (Transport), INRM	2005	2006
S. Tsukada	Principal Transport Specialist, INRM	2005	2006	
Evaluator: Quality Control Reviewer:	T. F. Jones N. Singru, OED2	Director:	R. B. Adhikari, OED2	

B. Project Description (summarized from the report and recommendation of the President)

- (i) **Rationale.** The western transport corridor, comprising national highway (NH) 8 and NH4 connecting Delhi, Mumbai, Bangalore and Chennai is the busiest corridor in India; this is particularly true of the 528 kilometer (km) section between Ahmedabad and Mumbai, where the corridor passes through an industrial belt with connections to several major west coast ports. A portion (348 km) of the Ahmedabad to Mumbai section was widened to a four-lane standard, while the remaining approximately 180 km section (between Surat and Manor) formed a severe bottleneck, hindering the efficient movement of goods and passengers between the industrial heartland of Gujarat and west coast ports (including Mumbai). The scale of the overall highway improvement program and associated high costs made the Government conscious of the need to mobilize private financing to develop the highway system. The private sector had taken up projects with relatively short payback periods, such as bridges and bypasses, but delayed assuming the higher capital costs and risks associated with financing long stretches of interurban highways until the correct environment and incentives were in place, and a long-term debt market was developed. These requirements were addressed separately, with private participation introduced through commercialization of the operation and maintenance (O&M) of the completed project facility. The Project was designed to be publicly funded but privately operated and maintained under a toll concession. The project O&M concession to the private sector was intended to serve as a model for use on other highway sections that are improved to the four-lane standard. The Asian Development Bank's (ADB's) involvement with the Project was also intended to provide an opportunity to advance policy dialogue with the Government on road sector reform issues, including the commercialization of O&M.
- (ii) **Objectives or expected outcomes.** The objectives of the Project were to remove capacity constraints and improve road safety on critical sections of the western transport corridor connecting Delhi to Mumbai, with the completed project highway operated and maintained by the private

sector through a toll concession. The commercialization of O&M of the project highway represents a significant step in increasing private participation in national highway development in India. The Project included the following: (a) the widening to four lanes (including strengthening of the existing two-lane pavement) of about 180 km on NH8 between Surat and Manor, (b) consulting services for construction supervision of road improvement, and (c) consulting services for the development of private participation and toll operations. In urban areas, the Project was to provide a six-lane divided highway with service roads. The design of the highway was based on a design speed of 100 km/hr, reduced to 80 km/hour in limited sections. The pavement traffic loading was derived from traffic projections and field investigation conducted during the feasibility study for the Project. The proposed design was based on the concept of staged construction, with an initial pavement life of 10 years to be extended to 20 years through overlay of the pavement after the 10th year. Safety issues were addressed in the design through design standards, road stripping, road signing, and the use of service roads in urban areas. Four toll plazas—using a barrier-type open toll collection system—were slated for construction at locations that would avoid disruption to local traffic between urban centers and ensure the capture of long-haul traffic, because of significant time and distance penalties along alternate routes. The design of the highway pavement was in accordance with international design guidelines. A further design review was slated to be carried out by the supervision consultants in relation to updated traffic and loading factors prior to the commencement of road improvements.

The project design included consulting services for construction supervision of the highway improvements, and to assist the National Highways Authority of India (NHAI) in its effort to promote private participation in the development of national highways and for backstop services relating to toll operations. The demonstration process for private participation requires a broad range of studies covering project feasibility, financing modalities, the legal framework, risk allocation, and institutional reform. ADB technical assistance (TA) that was then ongoing focused on developing a demonstration project and took the lead in this effort, but required supplementation through other studies and institutional reform measures to ensure the sustainability of private participation in highways (construction, maintenance, and operation). The application of tolls to additional sections of the national highway following improvement to a four-lane standard necessitated review and restructuring of toll rates, and establishment of proper regulatory mechanisms. Assistance was also projected to be required to prepare the O&M concession agreement for the completed project highway.

- (iii) **Components.** The Project comprised (a) the widening to four lanes (including the strengthening of the existing two-lane pavement) of about 180 km on NH8 between Surat and Manor, (b) consulting services for construction supervision of road improvements, and (c) consulting services for the development of private participation and toll operations.
- (iv) **Outputs.** The road works envisioned at appraisal were completed. Additionally, works constituting flyovers, underpasses, overpasses, and additional service roads were undertaken using loan savings. A toll system study and a comprehensive O&M concession study were carried out under the Project. A road safety audit covering about 2,800 km of the national highway and expressway sections was carried out and suggestions made for improvement of the Indian road safety guidelines and codes.

C. Evaluation of Design and Implementation (PCR assessment and validation)

- (i) **Relevance of design and formulation.** The Project was assessed at appraisal as being highly relevant and consistent with the Government's National Highway Development Plan and ADB's country strategy and program for India, and remains so at completion.
- (ii) **Components: Outputs and costs by component as envisioned during appraisal as compared to actual costs and achievement of outputs; reasons for any deviation.**

Project Cost at Appraisal and Actual

Item	Appraisal Estimate (\$ million)			Actual ^a (\$ million)			Actual/ Appraisal (%)
	Foreign	Local	Total	Foreign	Local	Total	
A. Base Cost							
1. Right-of-Way	0.0	12.0	12.0	0.0	7.7	7.7	64.3
Civil Works							
a. Section I	51.3	29.2	80.5	63.2	36.4	99.6	123.7
b. Section II	28.6	17.3	45.9	36.6	21.0	57.7	125.6
c. Section III	34.1	20.0	54.1	36.8	21.1	57.9	107.1
2. Consultant Services							
a. Construction Supervision	10.0	2.5	12.5	7.7	0.0	7.7	61.4
3. Private Participation and Tolling Operations ^b	10.0	2.0	12.0	2.5	0.0	2.5	21.2
4. Project Management	0.0	1.0	1.0	0.0	2.3	2.3	227.0
Subtotal (A)	134.0	84.0	218.0	146.9	88.5	235.4	108.0
B. Contingencies							
1. Physical Contingency	13.5	7.5	21.0	0.0	0.0	0.0	0.0
2. Price Contingency	15.1	8.5	23.6	0.0	0.0	0.0	0.0
Subtotal (B)	28.6	16.0	44.6	0.0	0.0	0.0	0.0
C. Interest During Construction	17.4	0.0	17.4	11.4	0.0	11.4	65.6
Total (A+B+C)	180.0	100.0	280.0	158.3	88.5	246.8	88.1

^a Includes cost of additional works and price escalation.

^b Capacity building for private participation and tolling operations (e.g., preparation of private participation framework, preparation of model concession agreements, and review of toll operations).

Sources: Asian Development Bank and National Highways Authority of India.

The total contract value for all civil works contracts at the time of award was \$130 million equivalent, compared with an appraisal estimate of about \$180 million. The lower-than-estimated cost arose from (a) the increased competition among contractors, (b) a decline in the value of the Indian rupee against the US dollar, and (c) overestimation at appraisal. Additional works on the project road to improve road safety and remove capacity constraints (at an estimated cost of \$66.8 million, with ADB financing of \$44.5 million) were approved, utilizing some of the loan surplus and implementing the works as part of the Project. Consulting services upon completion of the Project totaled \$10.2 million or about half the appraisal estimate. The project completion report (PCR) attributes this to appraisal overestimation but it is likely there were two other reasons: (a) the consultants were understaffed, either in terms of skills mix, time (person-months) or both; and (b) the devaluation of the Indian rupee. Interest during construction was significantly lower than the appraisal estimate, mainly because the loan was transformed from a pool-based to a London interbank offered rate-based loan.

- (iii) **Project cost, disbursements, borrower contribution, and conformance to schedule (as relevant to project performance).** At appraisal, the total cost project cost was estimated at \$280 million equivalent, comprising \$180 million in foreign exchange and \$100 million in local cost. The ADB loan of \$180 million was to finance the entire foreign exchange cost. At completion, the project cost was \$246.8 million equivalent, with a foreign exchange cost of \$158.3 million.

The loan approved by ADB on 27 July 2000 was provided from ADB's ordinary capital resources, determined in accordance with ADB's pool-based variable lending rate for US dollar loans. The borrower was NHA. The amended and restated loan agreement to switch from a pool-based to London interbank offered rate-based loan was signed on 4 July 2002 and made effective on 25 July 2002. Disbursements totaled \$149.749 million out of the \$180 million available, with \$30.251 million cancelled in two stages as loan savings. The report and recommendation of the President (RRP) did not include a disbursement schedule. Disbursement projections were made annually. Except in 2001, disbursements generally followed the annual forecasts.

Overall, implementation was delayed by 1 year, due mainly to slow approval of variations and the additional works.

(iv) **Implementation arrangements, conditions and covenants, and related technical assistance.** The implementation arrangements envisaged at appraisal were adhered to and were found to be adequate by the PCR mission. No improvements to these arrangements were cited or recommended by the PCR mission.

(v) **Performance of the Borrower and Executing Agency.** NHAI was both the Borrower and the Executing Agency (EA). Its overall performance in both roles was considered satisfactory. Preconstruction activities were undertaken so that the construction sites could be turned over to the contractors shortly after contract approval. The PCR does not mention that NHAI had roughly 2 years to prepare for implementation, due to the delay between project preparation and loan effectiveness. Had the loan been approved shortly after appraisal, it is doubtful the NHAI would have been so well prepared.

The NHAI project team provided strong management and problem solving capabilities, and the civil works were completed expeditiously. However, according to the PCR, NHAI delayed the initiation and award of contracts for sector studies, and advance action for procurement was approved before appraisal. Major variations were considerably delayed, mainly by central government agencies, regardless of the obvious beneficial effects of the proposed work. These delays could help explain the poor performance of the foreign contractor.

(vi) **Performance of the Asian Development Bank.** The PCR states that ADB's performance was satisfactory. This is evidenced by the successful and relatively timely completion of a well-designed project. Ten missions related to project implementation and/or administration were fielded after project appraisal, in addition to the PCR review mission. Project administration was delegated to the India Resident Mission (INRM) on 1 January 2003, about 2.5 years after loan approval.

D. Evaluation of Performance (PCR assessment and validation)

(i) **Relevance.** The Project was rated "highly relevant" by the PCR mission as it was consistent with the National Highway Development Plan and ADB's country strategy and program for India. This is clear from the very high traffic volumes on the project road and the clear need for capacity improvements. Also, the sector studies financed under the loan were appropriate to the needs of NHAI at the time, and assisted with private sector participation, tolling, O&M, and road safety. This evaluator agrees with the PCR rating. The project design was comprehensive and involved not only a large road improvement component but also several institutional initiatives. These aspects were well covered and explained in the RRP and PCR and the Project's goals were achieved. Overall, the design was good and appears to have been effective in implementation. No significant issues need to be highlighted.

(ii) **Effectiveness in achieving outcome.** The PCR rated the Project "effective", and this rating clearly was and remains appropriate. The only significant issues are the lack of measures to control axle loadings and thus reduce road deterioration, and the mixture of local, slow-moving traffic on the tollway, which raises safety and maintenance issues. The segregation of slow and fast moving traffic has been largely addressed through construction of service roads and six-lane stretches in urban and congested areas. Service roads are normally provided on both sides of a high speed road, and may cover only about 25% of road length. While provision of such service roads is an effective way of segregating local and through traffic, it cannot be assumed that slow traffic will always stay within paved shoulders. Where appropriate, the use of barrier separation of slow and fast moving traffic may be considered. Axle load control and proper maintenance of the highway facility are reportedly being adequately addressed by a model concession agreement covering expansion of roadways to six lanes, tolling, and highway O&M, under a long-term private sector concession.

(iii) **Efficiency in achieving outcome and outputs.** The PCR rated the Project "highly efficient." Given the very high traffic volumes, the high economic internal rate of return (EIRR) is expected

(the appraisal EIRR was 25%, while the PCR found the EIRR to be 32%). With widening to six lanes, efficiency can be maintained.

- (iv) **Preliminary assessment of sustainability.** Sustainability is rated “most likely”, as a private sector concessionaire will be responsible for road maintenance, funded by the collected tolls or through negative viability gap funding. The financial internal rate of return (FIRR) was lower than appraisal (9.6% as opposed to 14.2%). The meaning of the FIRR is difficult to judge as the PCR does not mention the weighted average cost of capital. Nevertheless, for this type of project, an FIRR of 9.6% is generally acceptable and an indicator of sustainability.
- (v) **Impact (both intended and unintended).** Several environmental impacts were identified by the summary initial environmental examination, and these were properly addressed during preconstruction and construction. This Project introduced a new but probably very effective scheme (pre-afforestation) to ensure that negative effects were corrected before they occur, by planting replacement and compensatory trees before any existing trees were cut down. The PCR draws the erroneous conclusion that trees and brush in the right-of-way and median reduce noise pollution. Many studies have shown that these have no significant effect on nearby areas.

The rehabilitation and resettlement of project-affected persons was undertaken by NHAI in accordance with the resettlement action plan, and with the assistance of a qualified nongovernment organization. A verification survey 3 years after appraisal identified a significantly higher number of project affected-persons than originally envisioned. There is some difficulty finding certain parties due compensation, but the funds are available once they are found.

E. Overall Assessment, Lessons, and Recommendations (validation of PCR assessment)

- (i) **Overall assessment.** The Project is rated “highly successful”. It achieved more than its objectives, due to adequate time to complete necessary preconstruction activities, and appropriate use of some loan savings. A considerable amount was cancelled, but the cancellation would not have been necessary if a sector approach had been followed; the sector approach has subsequently been introduced. Policy and institutional issues have been appropriately addressed and have been largely instituted.
- (ii) **Lessons.** The PCR correctly identified a number of lessons, including the poor performance of the foreign lead contractor firm(s). This is a common problem. Foreign firms are often brought into the prequalification process to augment the qualifications of the local contractor. The PCR states that prequalification standards have been strengthened to avoid such situations in the future, and this is a good response to an important lesson. This validation suggests the following lesson in addition to those listed in the PCR. Most projects of this type have overly optimistic implementation schedules. In the case of this Project, the EA had plenty of time to undertake the preconstruction phase, because loans to India were not being approved until about 2 years after appraisal. If the Project had been approved shortly after appraisal, the Project would most likely have experienced considerable delays. This Project can serve as an example of the need for more realistic implementation schedules.
- (iii) **Recommendations.** This Project provides a good example of allowing adequate time for preconstruction activities such as land acquisition, resettlement and advance procurement. Such activities should be included in a realistic implementation schedule.

F. Monitoring and Evaluation Design, Implementation, and Utilization (PCR assessment and validation)

NHAI, with the assistance of the supervision consultants, were tasked with carrying out performance monitoring and evaluation under the Project. Key indicators agreed upon by NHAI and ADB will be used as baseline data in these activities. The PCR concluded that this was complied with. A benefit monitoring and evaluation report containing key indicators was submitted in 2002. The project benefits were included by NHAI in their PCR.

G. Other (e.g., safeguards, including governance and anticorruption; fiduciary aspects; Government assessment of the Project, as applicable) (PCR assessment and validation)

Safeguards were complied with. Fiduciary aspects appear to have been well handled.

H. Ratings:	PCR	OED Review	Reason for Disagreement/Comments
Relevance:	Highly relevant	Highly relevant	
Effectiveness in Achieving Outcome:	Effective	Effective	
Efficiency in Achieving Outcome and Outputs:	Highly efficient	Highly efficient	
Preliminary Assessment of Sustainability:	Most likely	Most likely	
Borrower and EA:	Satisfactory	Satisfactory	
Performance of ADB:	Satisfactory	Satisfactory	
Impact:	Positive	Positive	
Overall Assessment:	Highly successful	Highly successful	
Quality of PCR:		Satisfactory	

I. Comments on PCR Quality. The PCR is well written. However, the PCR was found to be silent on the weighted average cost of capital in the financial evaluation, which could have been improved.

J. Recommendation for OED Follow-Up

No follow-up action required.

K. Data Sources for Validation

- (i) PCR, RRP, legal documents, Government's PCR;
- (ii) Management review meeting and staff review committee documents and summary record of discussion of ADB's Board of Directors;
- (iii) Board reports and other progress reports;
- (iv) project administration memorandum and list of archived documents;
- (v) supervision reports, including most recent midterm review or progress reports, back-to-office report of PCR Mission, etc.; and
- (vi) OED evaluations of previous projects, including PCR reviews.

REGIONAL DEPARTMENT'S RESPONSE TO THE PROJECT COMPLETION REPORT VALIDATION REPORT

On 21 April 2008, Director, OED2, Operations Evaluation Department (OED), received the following comments from the India Resident Mission, South Asia Department.

We have reviewed OED's earlier draft Project Completion Report (PCR) Validation Report circulated to us on 19 October 2007, 27 November 2007, and its final draft sent to us for review on 15 April 2008. We appreciate that the comments we made to OED on the earlier drafts have been adequately incorporated in the final draft. Therefore, we have no formal comment to make on the final draft.