



# Performance Evaluation Report

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Project Number: 31280  
Loan Number: 1986-SRI(SF)  
December 2011

## Sri Lanka: Road Sector Development Project

Independent Evaluation Department

Asian Development Bank

## CURRENCY EQUIVALENTS

### Sri Lanka

Currency Unit – Sri Lanka rupees (SLRe/SLRs)

	<b>At Appraisal</b> (1 Sep 2002)	<b>At Project Completion</b> (30 Jul 2009)	<b>At Independent Evaluation</b> (4 Mar 2011)
SLRe 1.00 =	\$0.011	\$0.008	\$0.009
\$1.00 =	SLRs95.00	SLRs114.88	SLRs110.67

## ABBREVIATIONS

ADB	–	Asian Development Bank
DBST	–	double bituminous surface treatment
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
HDM-4	–	Highway Design and Management Model
IDP	–	institutional development program
IED	–	Independent Evaluation Department
IRI	–	international roughness index
km	–	kilometer
MLGPC	–	Ministry of Local Government and Provincial Councils
MOH	–	Ministry of Highways
MOPH	–	Ministry of Ports and Highways
MTHCA	–	Ministry of Transport, Highways, and Civil Aviation
PCR	–	project completion report
PPER	–	project or program performance evaluation report
PPTA	–	project preparatory technical assistance
PRA	–	provincial road administration
RCDC	–	Road Construction and Development Company
RDA	–	Road Development Authority
REAP	–	reengineering action plan
RMBEC	–	road maintenance budgeting and expenditure control
RMMS	–	road maintenance management system
RMTF	–	road maintenance trust fund
RRP	–	report and recommendation of the President
RSDP	–	Road Sector Development Project
TA	–	technical assistance
VOC	–	vehicle operating cost

## NOTES

- (i) The fiscal year of the Government of Sri Lanka ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

### Key Words

adb, asian development bank, port, rails, reform program, roads, road fund, road maintenance, road sector development, sector development, sri lanka

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**Independent Evaluation Department, PE-749**

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The guidelines formally adopted by the Independent Evaluation Department (IED) on avoiding conflict of interest in its independent evaluations were observed in preparing this report. Amal S. Kumarage, J.M.S.J. Bandara, and Alan Bevis were the consultants. Narendra Singru, Senior Evaluation Specialist, IED acted as peer reviewer. To the knowledge of the management of IED, the persons preparing, reviewing, or approving this report had no conflict of interest.

**BASIC DATA**  
**Road Sector Development Project (Loan 1986-SRI [SF])**

**Project Preparatory/Institution Building**

TA No.	Technical Assistance Name	Type	Person-Months	Amount (\$)	Approval Date
2904	Second Provincial Road Improvement Project	PP	48	1,000,000	30 Oct 1997
3110	Reengineering of Road Sector Institutions	AD	33	1,000,000	8 Dec 1998
4074	Feasibility Study of National Highways Development	PP	75	850,000	19 Dec 2002
4075	Passenger Transport Services Improvement	AD	30	500,000	19 Dec 2002

Key Project Data (\$ million)	Per ADB Loan Documents	Actual
Total project cost	92.5	102.2
Foreign exchange cost	32.8	35.4
ADB loan amount/utilization	56.5	60.3
ADB loan amount/cancellation		
Amount of cofinancing (OPEC Fund)	8.5	7.8

Key Dates	Expected	Actual
Fact-finding mission	19 Apr–9 May 2001	10–25 May 2001
Appraisal mission	15–26 Oct 2001	14–26 Jun 2002
Loan negotiations	5–7 Feb 2002	15 Nov 2002
Board approval	26 Mar 2002	19 Dec 2002
Loan agreement	...	10 Feb 2003
Loan effectiveness	10 May 2003	22 May 2003
First disbursement	...	25 Jul 2003
Project completion	30 Jun 2008	30 Jun 2009 <sup>a</sup>
Months (effectiveness to completion)	61.7	73.3

Economic Internal Rates of Return (%)	Appraisal	PCR	PPER <sup>b</sup>
	26.1	34.9	27.8 <sup>b</sup>

**Loan Number**            Loan 1986-SRI(SF)  
**Borrower**                Government of Sri Lanka  
**Executing Agencies**    Ministry of Ports and Highways  
                                  Ministry of Local Government and Provincial Councils  
                                  Ministry of Transport

Mission Data		
Type of Mission	No. of Missions	No. of Person-Days
Policy dialogue	1	16
Fact-finding	1	84
Appraisal	1	39
Inception	1	28
Special Loan Administration	1	21
Consultation	2	12
Review	5	99
Project completion review mission	1	40
Independent evaluation mission	1	11

<sup>a</sup> The project was physically completed in June 2009 but still financially active at the time of PPER.

<sup>b</sup> The average of the 31 road sections

... = not applicable, AD = advisory, ADB = Asian Development Bank, OPEC = Organization of the Petroleum Exporting Countries, PCR = project completion report, PP = project preparatory, PPER = project or program performance evaluation report, SF = Special Fund, SRI = Sri Lanka, TA = technical assistance.

## EXECUTIVE SUMMARY

The Road Sector Development Project (RSDP) aimed to improve transport efficiency, thus contributing to the expansion of economic opportunities and the reduction of poverty. The RSDP was to develop capacity in the road sector and improve the road infrastructure in the country. The Asian Development Bank (ADB) approved the RSDP on 19 December 2002. The Independent Evaluation Department (IED) selected the project for evaluation in 2010. The investments under the RSDP were completed in 2008, allowing for sufficient time for impacts to be visible.

The RSDP's two major components were (i) Reform Program and (ii) investment. The Reform Program aimed to strengthen the performance and capacity of public sector institutions—the Road Development Authority (RDA) through implementation of agreed reengineering action plans (REAPs), and provincial road administrations (PRAs) through the implementation of the institutional development program (IDP). The investment component comprised (i) civil works for the rehabilitation of about 980 kilometers (km) of roads and bridges; (ii) improvement of about 40 km of community access roads; and (iii) consulting services for the design of national highway development that would result in detailed engineering designs for 411 km of national highways, including a topographic survey, tender documents, resettlement and utility relocation plans, and environmental and social studies. The RSDP also included advisory technical assistance for the Passenger Transport Services Improvement Project (TA 4075-SRI).

The RSDP improved 780 km of roads and 74 bridges. The project has a tapestry of 150 odd segments with an average length of about 5 km spread over four different provinces. Rehabilitation of about 200 km of provincial roads, 51 bridges, and 40 km of community roads was dropped from the scope of the project due to cost escalation. Under the Reform Program, all the REAPs (about 60 targets in 11 plans) and the IDP (about 10 targets in a plan) should have been fully implemented by 2005. There were about 70 targets all together in the Reform Program, but only about one-third of them were partly or fully achieved. Due to the unsatisfactory performance of the consulting firm engaged to work on the design of national highway development, a detailed design for only 130 km of highways was completed, but the consulting firm received 59% of the original contract value. TA 4075-SRI was designed to establish a regulatory framework for passenger transport services. However, the consulting firm's performance was poor and TA 4075-SRI delivered none of its expected outputs. The actual cost of the RSDP was \$102.2 million, 10.5% above the appraisal estimate of \$92.5 million. However, the total cost of the provincial roads component was about 32% above the estimated amount, and the increase in the unit cost of provincial roads component was about 72%.

The project completion report (PCR), finalized in December 2009, rated the project *successful*. The project was rated *highly relevant*, *effective* (the PCR used the term *efficacious*), *highly efficient*, and *less likely* to be sustainable. Taking into account the data provided and analyzed in the PCR, a validation report, prepared by IED, found the quality of the PCR *partly satisfactory*. The validation report rated the project *partly successful*.

The RSDP is rated *relevant*. The general design of the reform plan and the physical investment was consistent with the country's development priorities and ADB's country and sector strategies, both at appraisal and at project completion. However, the design of the project is complex, with numerous components and subcomponents that the report and recommendation of the President (RRP) did not clearly link with the project's objective, and the

selection of the 980 km of provincial roads created some issues. There were 182 road sections spread across the four project provinces. Obviously, a selection in line with project objectives was required, but it could have been discussed to what extent the selected road sections were relevant to economic development and poverty reduction.

The RSDP is rated *less effective*. The project improved 780 km of roads, compared with about 980 km expected at appraisal, 22% less than planned. The number of bridges was reduced from 125 to 74. A shortage of funds meant that 40 km of community roads were dropped or cancelled from the scope of the project. The consulting services for the detailed engineering design and TA 4075-SRI were incomplete. There were about 60 targets in the REAPs, but more than two-thirds of these were not accomplished. In the IDP, there were about 10 targets for the Reform Program, and only half of these were achieved or partly achieved. There are several reasons for the unmet targets: (i) the REAPs and the IDP were not provided in the RRP and the project administration memorandum, and could not be found in the implementation agencies; (ii) the RDA and the PRAs had limited understanding and ownership of the Reform Program, even by the time the project ended, so that not enough attention and effort was spent on meeting the targets; (iii) the consultant took the initiative in implementing the Reform Program instead of the RDA and the PRAs; (iv) the budget for the Reform Program was reduced; and (v) monitoring of the progress of the Reform Program was weak. Even in the PCR and the government completion reports prepared by the RDA and the Ministry of Local Government and Provincial Councils, more than 50% of the targets were not discussed and their progress and achievement was not mentioned at all.

The RSDP is rated *efficient*. At appraisal, the estimated economic internal rate of return (EIRR) of the overall project was 26.1%. However, there are weaknesses in the economic analysis at appraisal: (i) the validity of the analyzed data for the RRP and (ii) the assumptions of the economic evaluation. The pavement design called for double bituminous surface treatment (DBST). This is a low-cost pavement type but because it has a shorter lifetime than asphalt concrete pavement, it requires surface dressing every 3–5 years. These costs were not considered in the economic analysis of the RRP. The 31 selected road projects were evaluated by the IED. With an economic life cycle reduced from 20 to 10 years, the EIRR dropped to 20.1% and individual EIRRs ranged from –2.5% to 68.2%. The EIRRs of three of the 31 road sections were negative. In addition, 19 of the 31 road sections had recalculated EIRRs of less than 12%. More than 60% of the 31 road sections became less efficient. For the implementation of the investment component, ADB records indicate that ADB proceeded in an efficient manner and delays in project implementation were not due to ADB. ADB responded quickly and positively to requests from the Government of Sri Lanka, consultants, and PRAs in general. The implementation of the capacity development subcomponent was less efficient. The design of the implementation arrangements was cumbersome and inefficient.

The RSDP is rated *less likely sustainable*. The actual funding for maintenance of provincial roads has remained at about 40%–70% of the required budget. The REAPs intended to increase road maintenance financing and streamline road maintenance budgeting and expenditure control by establishing a road maintenance funding system. The road maintenance trust fund was established, but there is yet no arrangement for direct contribution to the fund from a fuel levy. The trust fund operates only as a separate budget item, and the intended outcome of establishing a road fund has not materialized. The extension of a road fund to the provinces has not happened, due to initial opposition of the provincial councils. Systems to support maintenance under the Reform Program could not be developed successfully or were abandoned. One of the achievements of the Reform Program was the reorganization of the RDA and the PRAs. However, there is still a shortage of qualified staff to fill newly created

positions. If the government is able to fill vacant positions in the RDA and the PRAs with qualified staff, the reorganization will be sustainable.

Overall, the project is assessed *partly successful*, based on a review of its relevance, effectiveness, efficiency, and sustainability, and on separate assessments of the project components.

The project impact is rated *partly satisfactory*. For the physical investment, field assessments showed that people who had assets benefited from the project, since they could improve the productivity of those assets. However, the Reform Program did not achieve the envisaged outcomes. The RRP included a project framework with 9 monitoring indicators associated with the project's outputs. The project framework is nonetheless relevant to assessing effectiveness. The project performance evaluation report (PPER) evaluated 1 of the 9 targets, which have been achieved; 4 of the 9 targets have been partly achieved; and 4 of the 9 targets have not been achieved

Since the project rehabilitated roads in the existing alignments, very little land acquisition was required and resettlement was minimal. With ADB assistance, resettlement activities were satisfactory and no pending resettlement issue was reported. The environmental safeguard requirements were generally complied with during project preparation. The project produced no major long-term negative environmental impacts.

Issues and lessons:

- (i) At appraisal, the difficulty of implementing the Reform Program could have been foreseen and special measures for monitoring and supervision should have been proposed in the RRP, and specific milestone requirements to check the progress of the Reform Program should have been set.
- (ii) Necessary data should be collected for the project roads at appraisal, and the selection methodology should have been a sound logical and scientific tool to shield it from political pressure.
- (iii) An appropriate method for economic justification should be carefully examined at appraisal. The economic analysis should have used observed data instead of the desktop estimation, and should be assessed based on sound assumptions.
- (iv) More careful monitoring and supervision should have been required to review the progress of the program, to understand its key issues, and to propose alternative approaches where necessary. The design of the Reform Program with its numerous components was complex, so efforts in monitoring and guidance should have been made during project implementation.
- (v) The requirements, key issues, terms of reference, selection criteria including qualification of consultants, implementation structure, and understanding and ownership of the TA by the implementing agencies should have been described carefully according to the requirements of technical assistance. If poor performance was observed, prompt action could have been required to minimize the loss of time and funds. The RDA also should have developed a well-maintained performance recording system.



## Follow-up actions for consideration by the South Asia Department:

Follow-Up Actions	Institution Responsible	Time Frame	Monitoring
<b>Selection methodology.</b> Since rehabilitation of provincial roads is still a priority in Sri Lanka, ADB should review the selection methodology to ensure its soundness before financing the next provincial roads.	ADB	Before next ADB-financed project for provincial roads	TA report(s)
<b>Economic reevaluation.</b> After project completion, no traffic volumes or road roughness data were collected. Traffic and road roughness data should be recorded periodically to provide information for future investment in provincial roads. Traffic counts and road roughness measurements should be carried out as soon as possible, so that economic reevaluation can be fully performed. This reevaluation should also be taken as feedback for the review of the selection methodology, and the data can be used for road maintenance as well.	ADB and MLGPC	Before the end of 2012	Sri Lanka Resident Mission to confirm progress
<b>Reform plan.</b> Many targets of the REAPs and the IDP were not accomplished. ADB should review the current status of the institutional capacity of the RDA and the PRAs, and propose follow-up actions regarding the unmet targets.	ADB	Before the end of 2012	Country partnership strategy

ADB = Asian Development Bank, IDP = institutional development program, MLGPC = Ministry of Local Government and Provincial Councils, PRA = provincial road administration, RDA = Road Development Authority, REAP = reengineering action plan, TA = technical assistance.

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## I. INTRODUCTION

### A. Evaluation Purpose

1. The primary objective of the Road Sector Development Project (RSDP) was to improve transport efficiency, thus contributing to the expansion of economic opportunities and the reduction of poverty. The project was to develop capacity in the road sector and improve the road infrastructure in the country. The Independent Evaluation Department (IED) selected the project for evaluation in 2010. This project performance evaluation report (PPER) provides inputs to the sector assessment for Asian Development Bank (ADB) assistance to the transport sector in Sri Lanka.<sup>1</sup> The investments under the project were completed in 2008, allowing sufficient time for impacts to be visible.

2. The PPER follows IED's evaluation guidelines,<sup>2</sup> and makes use of updated information on road roughness and traffic, and a rapid socioeconomic impact assessment of 10 road contracts. The draft PPER was shared with ADB's South Asia Department and the Government of Sri Lanka, and their comments were incorporated.

3. The project completion report (PCR), finalized in December 2009, rated the project *successful*.<sup>3</sup> The project was rated *highly relevant, effective* (the PCR used the term *efficacious*), *highly efficient*, and *less likely* to be sustainable. The PCR stated that the advisory technical assistance (TA) for the Passenger Transport Services Improvement Project (TA 4075-SRI)<sup>4</sup> that accompanied the RSDP aimed to (i) improve transport efficiency through developing streamlined regulatory and other arrangements for buses and other transport services using roads, and (ii) increase private sector participation in the road sector by exploring options for private operation of bus services. The self-evaluation rated TA 4075-SRI *unsuccessful*, due to the absence of specific TA outputs to be delivered by the consultants. Taking into account the data provided and analyzed in the PCR, a validation report, prepared by IED, found the quality of the PCR *partly satisfactory*. The validation report rated the project *partly successful*.<sup>5</sup>

### B. Expected Results and Program Objectives

4. ADB approved the RSDP on 19 December 2002. The project was to support the Reform Program and the improvement of provincial roads by (i) strengthening national and provincial road institutions to perform their core role of strategic management and planning of the road network; (ii) developing strong, competitive domestic capacity for road construction and engineering services; (iii) planning, executing, and financing road maintenance on a sustainable basis; and (iv) upgrading and increasing the capacity of priority roads. The project framework set six targets: (a) improved road planning, programming, contract management and

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<sup>1</sup> ADB. 2011. *Sector Assistance Program Evaluation for ADB Assistance to the Transport Sector in Sri Lanka*. Manila (Draft).

<sup>2</sup> ADB. 2006. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Manila. Available: <http://www.adb.org/Documents/Guidelines/Evaluation/PPER-PSO/guidelines-pper-pso.pdf>

<sup>3</sup> ADB. 2009. *Project Completion Report: Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 18 December).

<sup>4</sup> ADB. 2002. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Passenger Transport Services Improvement Project*. Manila (TA 4075-SRI, approved on 19 December); attached to ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December).

<sup>5</sup> ADB. 2010. *Validation Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI[SF], approved on 13 October).

implementation, land acquisition and resettlement, and a road maintenance system; (b) increased proportion of the Road Development Authority (RDA) work carried out by the domestic private sector; (c) improved quality and cost effectiveness of road construction and maintenance works; (d) at least 40% of provincial roads in the project areas in maintainable standard; (e) increased freight and passenger flows and access to economic and social services in the project areas; and (f) reduced travel time and improved transport services in the project areas. The project also aimed to increase private sector participation in the road sector by outsourcing construction and maintenance works and engineering services, and exploring opportunities for private operation of bus services; and improve the governance of the road sector by increasing transparency.

5. The project's contribution to economic growth and poverty reduction was to be measured by (i) increased per capita income in provinces and districts; (ii) improved rural income and employment rates at district, village, and household levels; (iii) reduced number of poor people in the project areas; and (iv) increased number of business enterprises registered with local government.<sup>6</sup> Access to better bus and road freight services was to help reduce poverty by enabling growth in incomes and employment for the poor, reducing transport service costs, and improving access to social services. The project was also to open up the market for private sector involvement in the road sector. The sustainable road maintenance funding scheme developed under the project was to ensure that the existing roads reach their design life.

6. Appendix 1 provides the design and monitoring framework for the project. It is based on the framework included in the report and recommendation of the President (RRP) and the PCR, which was found to contain rather qualitative indicators. It did not provide good baseline data. At project completion, the PCR did not update the project framework. This indicates inadequate efforts at appraisal and at completion to identify appropriate indicators. For this PPER, IED carried out a rapid social survey to measure the indicators.

## **II. DESIGN AND IMPLEMENTATION**

### **A. Formulation and Rationale**

7. Road maintenance, rehabilitation, and new construction activities for the road network in Sri Lanka have not kept abreast of the rapid growth in demand for transport. Traffic levels exceeded the design capacity of many roads and, due to neglect of road maintenance, road conditions were often poor. Uncontrolled roadside development also reduced the capacity of the network. This has had negative consequences for road user costs, road safety, and the quality and frequency of transport services, and limited the contribution of roads to national development, economic growth, and poverty reduction. The standard of bus services, the leading form of public transport in Sri Lanka, was generally poor, limiting service coverage, quality of service, safety, and reliability. The role of the domestic private sector in road contracting and engineering services was also underdeveloped. There was lack of professional and technical expertise, particularly in planning, programming, design, contract administration, and quality control within the provincial councils. Performance of road responsibilities in the provinces was weak and the condition of the provincial road network consequently deteriorated.

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<sup>6</sup> ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December). The loan was approved before ADB's current design and monitoring framework was in place. Instead, the RRP used ADB's former project framework, which specified a goal and purpose instead of an impact and outcome.

8. In 2000, the government and ADB agreed that the next ADB assistance to the road sector would focus on the implementation of institutional and policy reforms. After an extensive dialogue, the government and ADB agreed that the RSDP would be the first of three projects to improve transport efficiency and increase private sector participation in the road sector.

9. As a precondition to the fielding of the appraisal mission, the government agreed to (i) a 3-year transitional arrangement for assigning locally funded road works to local private sector companies, and (ii) preparation of packages for assigning such locally funded works to the private sector in 2002. These conditions allowed the Road Construction and Development Company (RCDC) to subcontract to private contractors.

10. The project drew lessons from past experience, so that advance procurement action was approved to solve early problems of implementation delays. Other lessons such as donor coordination, inadequate maintenance, lack of capacity, lack of completion, and outmoded business processes were incorporated into the project's design. Discussions were held with the Swedish International Development Cooperation Agency, the Japan Bank for International Cooperation, and other development partners in the road sector in Sri Lanka.

11. The project's two major components were (i) Reform Program and (ii) investment. The Reform Program aimed to improve the performance of national highway provision and had two subcomponents: (i) transferring most road construction and engineering activities to the domestic private sector on the basis of competition, with a commensurate decrease in the role of RCDC; and (ii) strengthening the performance and capacity of public sector institutions—the RDA through implementation of agreed reengineering action plans (REAPs) and provincial road administrations (PRAs) through implementation of the institutional development program (IDP). The investment component included (i) civil works for the rehabilitation of about 980 kilometers (km) of roads and bridges, or 12% of the provincial road network in North Central, North Western, Uva, and Western provinces; (ii) improvement of about 40 km of community access roads; and (iii) consulting services for construction supervision and for a detailed design of national highway development. The provincial road improvement component was expected to rehabilitate roads in the project provinces to maintainable standards. The roads were to be widened to a maximum of 6.7 meters where possible and the pavement strengthened. Bridges, drainage structures, and culverts were also to be improved and replaced as necessary.

12. With regard to the selection criteria for the provincial roads, a combined economic and social ranking was prepared and used for selecting roads for improvement in each of the four provinces. Based on this ranking, 182 road sections in 52 groups were selected for improvement, covering about 980 km.

## **B. Cost, Financing, and Executing Arrangements**

13. A comparison of actual project costs with those estimated at appraisal is in Appendix 2. The actual cost of the project was 10.5% above the appraisal estimate of \$92.5 million. Specifically, the cost of the provincial roads component was about 32% above the estimated amount. The increase in the unit cost of provincial roads component was about 72%. Price escalation during implementation, higher bid prices of contractors due to the market situation and shortage of materials, supply problems with bitumen, delays due to weather condition, and the tsunami contributed to the higher cost per km in the rehabilitation component. These higher costs in turn resulted in the achievement of only 80% of planned roads and 59% of planned bridges. The rehabilitation of roads and bridges accounted for over 95% of the cost overrun.

**Table 1: Outputs and Costs: Planned and Actual**

Item	Physical Targets			Costs (\$ million)		
	Appraisal	Completion	Ratio	Appraisal	Completion	Ratio
Reform program				3.5	3.1	0.9
Provincial roads <sup>a</sup> (km)	980	780	0.8	74.9	97.7	130.4
Bridges (number)	125	74	0.6			
Contingencies				11.7	0.0	0.0
IDC				1.6	1.4	0.9
<b>Total</b>				<b>92.5</b>	<b>102.2</b>	<b>110.5</b>

IDC = interest during construction, km = kilometer.

<sup>a</sup> Including consultancy services for the design of the National Highways Development Project.

Source: ADB. 2009. *Project Completion Report: Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 18 December).

14. The total amount of ADB financing was \$60.3 million. Due to the fluctuation of the exchange rate between the dollar and the special drawing rights (SDR) the dollar equivalent of SDR42.75 million rose to \$60.3 million at project completion, from \$56.5 million at loan approval. The favorable movement of the SDR–\$ exchange rate worked well for the loan so that at project completion savings of \$3.281 million were realized despite the cost overruns in the provincial roads component. The loan remains financially active despite the completion of works in June 2009, since savings from the project will be used to partly finance a water supply project, which is currently being processed.

15. The borrower's financing also came out higher by 25%, or \$6.9 million more than originally estimated, covering part of the cost overrun in the provincial roads component. The borrower's share of the provincial roads component reached 35%.

16. At appraisal, it was envisaged that the Ministry of Transport, Highways and Civil Aviation (MTHCA) was to monitor accounts related to the Reform Program and the National Highway component, while the Ministry of Home Affairs, Provincial Councils and Local Government was to monitor accounts related to the provincial road improvement component. In 2004, the MTHCA was reorganized into two agencies: (i) the Ministry of Highways (MOH)<sup>7</sup> and the Ministry of Transport. The MOH took over the responsibilities of the MTHCA related to the project. In 2005, the Ministry of Home Affairs was reorganized into the Ministry of Local Government and Provincial Councils (MLGPC), and all arrangements related to the provincial road improvement component remained with the MLGPC.

17. A project steering committee was formed and chaired by the secretary of the MTHCA (then MOH) with representation from the Ministry of Finance and Planning, the RDA, the External Resources Department, the National Planning Department, regional development ministries, and project implementation consultants.

18. The RDA coordinated the implementation of the REAPs. A steering committee, under the RDA, was set up comprising representatives from the public and private sector to oversee the REAPs and simplify coordination between the private sector and the government. A project coordination unit, under the MLGPC, was responsible for the planning, management, and day-to-day activities related to the provincial roads improvement. While there appeared to be many

<sup>7</sup> The MOH is now the Ministry of Ports and Highways (MOPH).

committees and working groups for the implementation of the project, the executing agencies were pleased with the arrangement and found it to be effective.

### **C. Procurement, Construction, and Scheduling**

19. Initial mobilization and commencement of works was slow, partly due to delays in procurements because of the lack of bids. Recruitment of consultants was also delayed as a result of the civil unrest and the tsunami. These partly slowed down implementation of both the provincial road improvement and reform components. Performance-related issues with consultants further stymied smooth implementation. Small and medium-sized contractors were generally lacking in experience and resources, and needed more time to complete construction. Changes in scope (paras. 21 and 22) and the supply of bitumen also contributed to the late completion of the project. Most of the contracts were delayed from 1 to 21 months. In all, there were 80 contract packages for 182 road segments and 74 bridges spanning 780 km. The last contract package was completed in August 2008 in Northwestern Province after a delay of 21 months. Three contract packages were completed on time. The loan remains financially active pending the final allocation of the loan savings (in \$) to a water supply project (para. 14).

20. Procurement was implemented according to ADB's Procurement Guidelines<sup>8</sup> and was broadly in line with procedures envisaged at appraisal.

### **D. Design Changes**

21. The project improved 780 km of roads, compared with 980 km expected at appraisal, 22% less than planned. The number of bridges was reduced from 126 to 74, 42% less than planned. Bids for the contracts were substantially higher than estimated at appraisal, so the project scope was reduced. Shortage of funds also meant that the rehabilitation of 40 km of community roads was dropped from the project scope.

22. The unit cost per km of rehabilitated roads, including bridge contracts, increased by 72% (Appendix 2). Some of the reasons given by the MLGPC include (i) the 2-year time lag between project preparation and actual construction resulting in price increases; (ii) bids based only on conceptual designs; (iii) scarcity of materials; and (iv) the sudden influx of tsunami recovery activities after December 2004, causing significant construction cost escalation. Many road sections were in poor condition and some show signs of accelerated deterioration. If a detailed design for the provincial roads was prepared at the appraisal stage, the cost escalation could have been minimized. When the scope of the physical component was reduced, the selection criteria for the provincial roads and the combined economic and social ranking were not applied to the changes. Some priorities changed for reasons that appeared more political than economic and social (para. 49). The selection methodology should have been applied more rigorously when the project scope was changed and the impact of changes after completion should have been reviewed. The project and any change in scope should have a sound logical and scientific basis to shield it from political pressure.

23. The PCR did not mention any change in the capacity development components, but the government completion report prepared by the MLGPC reported that the costs of the capacity development component for four PRAs was 1.3% of the total at completion (\$1.3 million), compared with 4.1% at appraisal (\$3.8 million). Another government completion report prepared by the RDA reported that the actual expenditure for the REAPs was \$3.0 million against

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<sup>8</sup> ADB. 2010. *Procurement Guidelines*. Manila.

\$3.5 million estimated at appraisal. Although funds for the capacity development had been reduced, the change in scope was not clearly explained in the government completion reports.

## E. Outputs

24. The project improved 780 km of roads and 74 bridges. About 200 km of provincial roads, 51 bridges, and the rehabilitation of 40 km of community roads were dropped from the scope of the project, due to cost escalation (para. 21). The project has a tapestry of 150 odd segments with an average length of about 5 km spread over four different provinces. The output of the investment component falls short of the targets indicated in the project framework, which was 1,000 km of improved road by 2007.<sup>9</sup>

25. Under the Reform Program, all the REAPs and the IDP should have been fully implemented by 2005. Some of the REAPs that were implemented were completed after project completion, some with support from another TA and/or project, while some were completed but have not been used. The capacity development component of the National Highways Sector Project<sup>10</sup> included the second stage of the REAPs. As the implementation period was the same, a demarcation of capacity development elements was not clearly defined.

26. The PCR states that (i) reforms under the project resulted in a more streamlined structure of the RDA;<sup>11</sup> (ii) a series of concept papers, guidelines, and manuals were developed and issued under the REAPs; (iii) job descriptions for key personnel were formulated; (iv) project management units for foreign-funded projects were brought under RDA line management; and (v) the proposed new structure for the RDA's provincial offices mirrors the structure of the RDA head office and was piloted only in the Southern and Sabaragamuwa provinces, before being implemented in the other provinces. There were about 70 targets in the Reform Program, but only about one-third of them were partly or fully achieved (Appendix 3). The targets under the action plans on the development of the private sector, establishment of an interprovincial coordinating committee, and establishment of a national road research and training institute showed less activity and achievement. The remaining targets were incomplete. The PCR made a recapitulative assessment of the achievements, but was silent about what was not achieved. A detailed assessment of the implementation and achievement of the targets was not undertaken. The REAPs and the IDP, which were the key guidance to strengthening the performance and capacity of public sector institutions, were not found at the RDA, the MLGPC, the PRAs, or in ADB's project records. The implementation of the REAPs and the IDP was not recorded comprehensively and consecutively, but fragmentarily. These are the reasons why the PCR could not evaluate all activities of the Reform Program.

27. The project included consulting services for the design of national highway development. The consultancy was to provide the detailed engineering design for 411 km of national highways, including a topographic survey, tender documents, resettlement and utility relocation plans, and environmental and social studies. Due to the unsatisfactory performance of the consulting firm for the national highway design, the consultants had completed only about 10% of the assignment by the end of the initial contract period. The scope had to be reduced to one-third

<sup>9</sup> While the project framework indicated 1,000 km as a target, specific targets in the RRP were 980 km of roads and bridges and 40 km of community access roads.

<sup>10</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

<sup>11</sup> The RDA was streamlined from 16 to 5 functional divisions: (i) Planning and Programming, (ii) Asset Development, (iii) Asset Operations and Maintenance, (iv) Finance and Administration, and (v) project management units.

and the resettlement and utility relocation plans, and environmental and social studies had to be removed from the contract by the RDA. The remaining topographic survey and detailed design works were transferred and completed under the Road Project Preparatory Facility.<sup>12</sup> The final report was not kept at ADB, but the PCR confirmed that the detailed design for 130 km of the road sections had been completed, although it was not possible for IED to reconfirm the status of the completion, because the final reports were not available for review. A total of \$0.71 million was paid to the consultants against a contract value of \$1.20 million. The consultants received 59% of the original contract value for the reduced scope, but there were many defects in the design and redesign was required, which caused an implementation delay and cost increase.

28. TA 4075-SRI (see footnote 4), which accompanied the project, was designed to establish a regulatory framework for passenger transport services. It focused on improving public and private participation in the sector, through institutional and policy reforms. TA 4075-SRI was expected to (i) help the government introduce public–private partnerships in the sector, possibly through a route-franchising system; (ii) define a regulatory framework and list priority investments needed to upgrade passenger bus services; and (iii) assist four provinces in implementing the proposed reforms. The recruited consultant’s performance was poor and the consultant failed to provide the interim report. The government requested World Bank funding for an individual consultant to expedite the needed advice on the pressing issues of the bus sector. ADB transferred the remaining TA funds to project preparatory technical assistance (PPTA) for a 20 km bus rapid transit system, but failed to formally submit the proposal on time. As a consequence, TA 4075-SRI delivered none of its expected outputs and was rated *unsuccessful* in the TA completion report.

## F. Consultants and Contractors

29. The Reform Program consultants were fielded in September 2004, after a protracted recruitment due to some issues raised by the first-ranked consulting firm. Subsequently, the second-ranked firm was engaged. The firm had initial difficulties maintaining the composition of the team, and the pace at which the consultants undertook the activities was slower than expected. Still, the reform consultants were able to produce documents for some of the REAPs, and introduce and provide training for the Highway Development and Management Model (HDM-4). Some activities under the REAPs were not carried out (Appendix 3). The performance of the reform consultants is rated *partly satisfactory*.

30. The performance of the consultants for TA 4075-SRI—meant to establish a regulatory framework for passenger transport services—was poor. The inception report needed major revisions and the draft interim report showed a lack of understanding of the issues and objectives. Despite efforts by the government and ADB, the quality of the TA work did not improve. As a result, TA 4075-SRI delivered none of the expected outputs. The performance of the consulting firm engaged for the TA is rated *unsatisfactory* by the PCR. The validation report concurred with the rating.

31. The consulting firm for the national highway design was fielded in December 2005. Several issues emerged with the implementation of the design. The consultants failed to submit satisfactory outputs, despite several extensions in the time frame. It was envisaged that for 411 km of national highways, a detail design including topographic survey, tender documents,

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<sup>12</sup> ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Democratic Socialist Republic of Sri Lanka for the Road Project Preparatory Facility*. Manila (Loan 2080-SRI[SF], approved on 13 April).



resettlement and utility relocation plans, and environmental and social studies was to be drawn up, but only a detail design was completed for only 130 km (para. 27). Consultant performance for this component is rated *unsatisfactory*.

32. A consulting firm responsible for implementation of the provincial roads component was engaged to strengthen the PRAs and supervise the rehabilitation of the provincial roads. Seventeen contractors carried out 54 packages comprising 22 contracts under Phase I, 20 contracts under Phase II, and 12 contracts under Phase III. This is 17 contracts short of the 71 contracts envisaged at appraisal. The implementation consultants were mobilized in February 2004. The scope of some contracts had to be modified to accommodate implementation requirements and the works of two contracts that had been terminated.

33. Some implementation delays were brought about by small to medium-sized contracting firms that seemed to lack experience and resources, so they had to be trained and construction had to be closely monitored. There were also communication difficulties between the international consultants and staff of the PRAs. Despite these issues, the completed works were of sufficient quality and the performance of the implementation consultants and contractors is rated *satisfactory*.

## G. Loan Covenants

34. The independent evaluation mission found that 30 of 47 loan covenants had been satisfactorily complied with by project completion and 12 covenants had been partly complied with or needed support from another TA or project. The remaining five were not complied with. Some covenants had been complied with at the time of project completion, but were not sustained and were inactive or not functioning at the time of the independent evaluation mission. The HDM-4 was introduced and staff trained, but it remained unused until a World Bank project required the use of the software. A technical audit unit was established as part of the loan conditionality, but no longer functions.

35. The covenants that relate to private sector participation (Appendix 7 of the RRP) were not presented by the PCR in the list of covenants. They are included in the list of covenants in Appendix 4 of this document. A significant outcome is the engagement of the 20 domestic private sector contractors on a pilot basis. This pilot project became a catalyst to more private sector participation and many of these companies continue to operate and enter into contracts with the RDA.

## H. Policy Framework

36. **Macroeconomic condition.** During the last 5 decades, Sri Lanka's economy has grown at an annual average rate of 4.4%, but this was insufficient to elevate the country to a high-growth path, due to deep-rooted, growth-stifling deficiencies, including a protracted armed conflict. In 2010, the nominal gross domestic product (GDP) of Sri Lanka was estimated to have reached about \$50 billion and GDP per capita was approximately \$2,400.<sup>13</sup> The labor force in 2009 was estimated at 8.1 million, with an unemployment rate of 5.8%. The Human Development Index in 2010 was 0.66, ranking Sri Lanka 91st among 169 countries.<sup>14</sup>

<sup>13</sup> Central Bank of Sri Lanka. 2010. *Annual Report*. Colombo.

<sup>14</sup> UNDP. 2010. *International Human Development Indicators*. New York.  
Available: <http://hdrstats.undp.org/en/countries/profiles/LKA.html>

37. Despite the prolonged civil conflict in the country, the growth performance of the economy has been relatively good. Nevertheless, the country has not lived up to its growth potential and economic performance still lags that of East Asia and Southeast Asia. The government now seeks to attain greater stability and has adopted higher GDP growth targets. The development of the economic infrastructure needed for faster growth is to be accelerated through continued policy, market, social, institutional, and infrastructure reforms.

38. **Road administration.** Until January 1989, all major roads were managed by the Department of Highways. Currently, Class A and Class B roads are classified as national roads and are managed by the central government through the RDA under the Ministry of Ports and Highways (MOPH). The provincial roads, which are usually situated entirely within the province, are managed by the respective provincial councils through PRAs. Roads that are not classified as national or provincial roads but are fully within municipal or urban council areas, are maintained by urban local governments. There are 18 municipal councils and 48 urban councils managing 5,176 km of road. Rural roads are those in rural areas maintained by rural local authorities called *Pradeshiya Sabhas*.

39. **Road maintenance.** Road maintenance for national highways has been financed from budgetary allocations under the budget item of road maintenance, and it has been titled "maintenance of roads and bridges." The road maintenance trust fund has been ratified under the provisions of a Trust Ordinance in 2005. However, there is no arrangement yet for direct contribution to the fund from a fuel levy since the Treasury was opposed to allow a fully fledged fund managed outside of the Treasury. The intended outcome of setting up a road fund with independent and predictable financing mechanism has not materialized as yet.

40. The board of trustees was chaired by the deputy secretary of the Treasury and included the secretary of the MOPH or his successor and the chairman of the Finance Commission. In addition to the board of trustees, the secretary of the Treasury appointed a technical advisory committee with representatives from the Ministry of Finance and Planning, the MOPH, the MLGPC, the National Contractor Association, freight forwarders, the National Transport Commission, academia, and others specializing in fields relevant to road transport. The committee was chaired by the secretary of the MOPH.

41. The RMTF was operational in 2006, with a budgetary allocation of SLRs3 billion. This has increased to SLRs6.7 billion for 2010. However, due to a higher budget allocation for new road construction and improvement, maintenance allocation in the RDA budget in 2010 was smaller than in 2006.

**Table 1: Annual Allocation for Road Maintenance, 2004–2011**

Year	Allocation (SLRs million)		
	Maintenance	Total	Maintenance as % of Total
2004	1,116	16,610	6.7
2005	1,880	21,064	8.9
2006	2,990	37,158	8.0
2007	3,410	44,601	7.6
2008	3,103	67,140	4.6
2009	3,049	90,483	3.4
2010	6,725	84,689	7.9
2011	5,000	102,296	4.9

SLRs = Sri Lanka rupees.

Note: Both the maintenance and the total budgets are for national highway. The 2011 figures are indicial allocations. The total includes new road construction and improvement, and maintenance.

Source: Road Development Authority.

42. The extension of a road fund to the provinces has not materialized, due to initial concerns by the provincial councils that such an action would lead to the reduction of central government funding currently provided for provincial road maintenance. In the case of the provincial roads, funds received for road maintenance from central government through the Finance Commission have remained relatively unchanged for all PRAs. These allocations are made under the object code “recurrent expenditure—buildings and structures” for office maintenance and staff salaries, and under “capital expenditure—rehabilitation and improvement—structures” for maintenance contracts or materials. After deliberations with the Finance Commission, the provincial councils receive an untied block grant, so the PRAs have to compete with other maintenance requirements. Such untied funds, however, are driven largely by political concerns without consideration of road network requirements. The actual funding for maintenance of provincial roads has remained around 40%–70% of the required budget. This, as a rule of thumb, is an average cost of SLRs100,000 per km, except in Western Province, which has a significantly higher revenue income from annual licensing of motor vehicles.

43. **Poverty reduction.** The government’s framework for poverty reduction recognized that one of the main challenges in creating opportunities for the poor was to link poor regions to rapidly growing domestic and international markets. It marked building up the national highway system, integrating the road network, and boosting the performance of the bus system as a priority. The framework also recognized the need for institutional and policy reform to improve the performance of the road sector, including more private sector participation and better road maintenance.

### III. PERFORMANCE ASSESSMENT

#### A. Overall Assessment

44. The project is rated *partly successful*, based on a review of its relevance, effectiveness, efficiency, and sustainability, and on separate assessments of the project components. The total

performance rating is based on four criteria: relevance (20%), effectiveness (30%), efficiency (30%), and sustainability (20%). Individual criterion ratings ranged from 0 to 3.

**Table 2: Overall Performance Assessment**

Criterion	Rating	Weighted rating	Rating Description
Relevance (20%)	2.0	0.4	Relevant
Effectiveness (30%)	1.0	0.3	Less effective
Efficiency (30%)	2.0	0.6	Efficient
Sustainability (20%)	1.0	0.2	Less likely
<b>Overall Rating</b>		<b>1.5</b>	<b>Partly Successful</b>

Note: Highly successful >2.7; successful 2.7>S>1.6; partly successful, 1.6>PS>0.8; unsuccessful <0.8.

Source: Independent evaluation mission.

## B. Relevance

45. The PPER rates the project *relevant*. The general designs of the Reform Program and physical investment were consistent with the country's development priorities and ADB's country and sector strategies, both at appraisal and at project completion, and have an obvious link to improvement of road transport efficiency. However, the design of the project is complex, with numerous components and subcomponents that the RRP did not clearly link with the project's objective, and the selection of the 980 km of provincial roads raised some issues. The 182 road sections were spread over the four project provinces and not connected with each other. Selecting the provincial roads most relevant to the objectives of the investment component was required, but it could have been discussed how they related to economic development and poverty reduction.

46. The RRP says that the following steps were used in the selection of road sections for the provincial road improvement: (i) a survey was carried out on more than 2,000 provincial roads in the four provinces covering a combined length of about 5,100 km; (ii) simplified economic evaluations were carried out for the purpose of preliminary screening of candidate roads; (iii) drawing upon the social indicators obtained for each road, a social development factor was calculated for each candidate road, and this was used to produce a social ranking; and (iv) a combined economic and social ranking was then prepared and used for selecting roads for improvement in each of the four provinces.

47. To assess the selection methodology, IED reviewed the final report of phase 2 of the PPTA (TA 2904-SRI) for the project.<sup>15</sup> Savings in vehicle operating cost (VOC) was the only parameter used for the simplified economic analysis, and traffic volume and road roughness data were key parameters to calculate VOC. Traffic counts were conducted on only 80 out of more than 2,000 provincial roads, for 9 hours between 6:00 a.m. and 3:00 p.m. on one day during the week of 31 January 2000. Traffic volumes on the other roads were estimated based on desktop estimation of divisional officers and moving observation counts during the condition survey. A road roughness test vehicle was not available, but the roughness was derived from the extent and severity of the pavement distress record made by a visual survey. The extraction rate of the traffic counts was less than 4%, and other traffic counts and international roughness

<sup>15</sup> ADB. 1997. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Second Provincial Roads Improvement*. Manila (TA 2904-SRI, approved on 30 October).

index (IRI) data were estimates. Since no traffic statistics of provincial roads existed in Sri Lanka, accuracy of estimates could not be expected.

48. There were five parameters to describe in detail the basis for social scoring of project roads: (i) intensity of facilities along the road, including schools, hospitals, and religious places; (ii) whether the road is nominated as part of a bus route; (iii) whether the bus service is in operation, (iv) the proportion of total families made up of Samurdhi grantees among the total number of families in areas; and (v) the proportion of public assistance recipients among the inhabitants. Roads in developed and busy areas rather than poor areas would get more priority by the first three parameters. Although the last two parameters would help find roads in poverty areas, the TA 2904-SRI final report says that when the social ranking was combined with the economic ranking, in most cases “traffic” roads over longer distances were chosen, i.e., those roads that are likely to show a strong relative net present value of economic return in the selection of provincial roads. The tables of the top 100 ranked roads in the four provinces in the TA 2094-SRI final report showed that most of the top 100 had a higher economic than social ranking. Although the objective of the selection methodology was to provide a mix of roads that overall provided sufficient economic return to support investment as well as an attractive rate of social benefits, including the potential to alleviate poverty, the selection methodology did not clearly link the priority roads to poverty alleviation and did not succeed in selecting roads that would support proactive poverty alleviation. Given the lack of direct observation in most of the data for the economic analysis, and the above-mentioned weakness in the evaluation of social impact, it is difficult to say that the selection of provincial road sections had a clear link to the project’s objectives of contributing to the expansion of economic opportunities and the reduction of poverty.

49. According to the TA 2094-SRI final report, 296 provincial roads were selected, but the RRP included only 182 road sections in the project. The economic reevaluation, prepared by the supervision consultants in February 2008, said only one-third (52 roads) were taken from the selected provincial roads in TA 2094-SRI. Most of the project roads were selected from outside the TA 2094-SRI screening process. The mechanics of the final screening and decision making are not clear, nor is the relevance of the selected provincial roads to the objectives of the project. During IED’s reconnaissance mission in October 2010, some PRAs said that the methodology of the selection of provincial roads had not been cleared with them, and some of the selected roads were not their priority. In addition, during project implementation it was also reported that some priorities changed for reasons that appeared more political than based on economic and social evaluation (see para. 22).

50. For the design of the design monitoring framework, performance targets of impact are lofty objectives that seem quite remote from the outcomes of the project. Some of the outputs and almost all outcomes that were described did not have qualitative targets and time frames, which made it difficult to monitor.

### **C. Effectiveness**

51. The PPER rates the project *less effective*. The project improved 780 km of roads, compared with about 980 km expected at appraisal, or 22% less. The number of bridges was reduced from 125 to 74. A shortage of funds meant that 40 km of community roads were dropped or cancelled from the scope of the project. Appendix 3 shows achievement levels for all targets of the Reform Program of the project. There were about 70 targets in the Reform Program, but more than two-thirds of these were not accomplished.

52. The REAPs consisted of 11 categories, 7 of which concerned the reengineering of the RDA.<sup>16</sup> One category was the development of the private sector, another the development of RCDC, and the remaining two were the establishment of the interprovincial coordinating committee and the establishment of the National Road Research and Training Institute. Progress in three, RDA-related categories—strengthening of preconstruction processes, strengthening of construction management, and strengthening of land acquisition and resettlement—was better than in the other eight categories. It seems that the RDA had greater interest in extending its capacity for construction. The RDA also paid attention to land acquisition and resettlement, because of lessons learned from the Southern Transport Development Project.<sup>17</sup> The REAPs succeeded in the introduction of standard procedures relating to land acquisition and resettlement issues, which increased efficiency in implementing the other projects. The REAPs also established the planning division data collection unit and the maintenance management unit in the RDA. The RDA became a more effective organization and strengthened its institutional capacity on planning and maintenance. However, while the RDA was reorganized from 16 to 5 functional divisions (footnote 12) and 5 assistant director-general posts were created, there still are 16 posts of divisional director and the desired streamlining has yet to be achieved. To strengthen road maintenance management the REAPs tried to establish a road maintenance management system (RMMS) since the increase in capacity for road maintenance was an urgent issue in Sri Lanka. However, it was discovered that the road maintenance budgeting and expenditure control (RMBEC), which was developed by TA 3691-SRI<sup>18</sup> and was expected to be a core system for RMMS, had malfunctions in the software program. The RDA used the RMBEC for only about 1 year and then abandoned it. The maintenance budget of national roads has been manually managed. The REAPs could not achieve significant outputs under this category. For the category of road funding, a major objective was to develop and implement a road maintenance financing scheme by 2005. Compliance with covenants on road maintenance financing did not occur and the issue of road maintenance funding is still unresolved. The remaining categories of the REAPs—development of the private sector, establishment of an interprovincial coordinating committee, and establishment of a National Road Research and Training Institute—were inactive and without much progress.

53. In the IDP, there were about 10 targets for the Reform Program, and half of them were achieved or partly achieved, the others were not attained. The IDP established dedicated road agencies in each province to take over from provincial engineering units and focus on effective road network management, increased the maintenance budget, and reached the target set in the loan covenant. This covenant specified that the allocation of a road maintenance budget would be 10% more in 2004 than in 1999. Some provinces established road departments within their existing provincial administration, while others opted for more autonomous road authorities. However, the PRAs had difficulty in staffing the reorganized institutions, which may have reduced the effectiveness of the institutional reforms.

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<sup>16</sup> The seven categories for the reengineering of the RDA were (i) strengthening of planning and programming, (ii) strengthening of preconstruction processes, (iii) strengthening of construction management, (iv) strengthening of road maintenance management, (v) establishment of technical audits, (vi) road funding, and (vii) strengthening of land acquisition and resettlement.

<sup>17</sup> ADB. 1999. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Southern Transport Development Project*. Manila (Loan 1711-SRI[SF], approved on 25 November).

<sup>18</sup> ADB. 2001. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Road Maintenance Budgeting and Expenditure Control*. Manila (TA 3691-SRI, approved on 27 July).

54. One of the key capacity development initiatives was to implement performance-based contracts for road maintenance. Only one PRA introduced a performance-based maintenance system to contract routine maintenance out to private firms. The other three PRAs did not implement the program, because they received only about 30% of their maintenance funding requirement. As private sector work is about 15% more expensive than force-account work, the program would have limited maintenance to an even smaller part of the network.

55. In total, the Reform Program could not achieve two-third of the targets. There were several reasons for this. First, the Reform Program was ambitious and complex, and the RRP does not clearly link the numerous components and subcomponents to the project objectives. The Reform Program tried to deal with almost all institutional issues raised by the project. However, other TA projects and loans have provided support for institutional capacity development on the same topics in the same period, such as road maintenance budgeting and expenditure control, capacity development for financial management of road projects, road sector master plan, and capacity development of the environment and social divisions. This parallel approach confused the executing agencies and they consequently lost ownership. Second, the REAPs and the IDP were not provided in the RRP and project administrative memorandum, and could not be located at the RDA, the MLGPC, and the PRAs. The MLGPC said that the loan covenants regarding the institutional development were the IDP. Third, the RDA and the PRAs had limited understanding of the Reform Program even by the time the project ended, and limited ownership to ensure the necessary attention and efforts for all the targets. Fourth, the consulting firm took the initiative in implementing the Reform Program and the implementing agencies did not have any problem with the arrangement. Fifth, the budgets for the Reform Program were cut (para. 23). Finally, monitoring of the progress of the Reform Program was weak. Even in the PCR and the government completion reports prepared by the RDA and the MLGPC, more than 50% of the targets were not discussed and their progress and achievements were not mentioned at all. With careful monitoring, a more user-oriented service would have been provided and the number of achieved targets and the quality of capacity building would have increased.

56. The project included consultancy services for detailed engineering design of national highways and the advisory TA 4075-SRI. Both works were not completed (paras. 27 and 28). ADB and the RDA should have been more responsive to the consulting firms' failure to provide the envisaged outputs effectively so that any unnecessary payment could have been avoided.

#### **D. Efficiency**

57. The PPER rates the project *efficient*. At appraisal, the estimated economic internal rate of return (EIRR) of the overall project was 26.1%. The RRP also assessed the EIRRs for a sample of 40 selected roads, which ranged from 12.3% to 150.1%, and more than 50% of the EIRRs of the 40 sample roads are above 30%. However, there are weaknesses in the economic analysis at appraisal. The first is the validity of the analyzed data for the RRP.

58. The RRP explains that after selection of the priority roads for improvement, the preliminary traffic counts were supplemented by conducting a 2-day, 12-hour count, from 6:00 a.m. to 6:00 p.m., on each of the selected roads. However, the final report of the TA 2904-SRI explains that only 102 traffic counts out of the 296 screened provincial roads were implemented in July 2000. In addition, this traffic data was not directly used in the economic analysis for the screened roads. The traffic volume obtained was used to create three categories of hypothetical

traffic demand.<sup>19</sup> According to the final report of phase 2 of the PPTA of the Second Provincial Road Improvement Project, TA 2904-SRI adopted an approach using “category analysis.” A set of hypothetical road data, 63 patterns in total, was established by road type categories,<sup>20</sup> traffic demand level (high, medium, and low), road surface condition (good condition, fair condition, and poor condition), and a tier of improvement costs.<sup>21</sup> The 63 hypothetical patterns were analyzed by the HDM-4. Although precise data—e.g., traffic volume, the IRI, construction and maintenance costs—are crucial evaluation parameters for economic verification, no information was made available from direct observation and all of the used data was hypothetical. The PCR also cited data constraints as a major impediment to a full EIRR analysis.<sup>22</sup>

59. The PCR assessed an overall EIRR of 29.0% for the project as a whole (about 150 road sections), with values ranging from 0% to 61% despite cost increases and scope reduction. Traffic data and the IRI were not counted for the PCR, although the actual rehabilitation costs were used. Under these assumptions and data used, the PCR’s calculation of the EIRR is still hypothetical, the same as the RRP’s. In addition, the EIRR of the PCR is 3% higher than at appraisal, although the unit cost of the improved provincial roads was increased by 72%. Reasons why the PCR got the higher estimate were not explained in the PCR.

60. The PPER calculated the EIRR with the same assumptions on traffic growth, unit cost value of VOC, value of time, and recurring maintenance cost with necessary update as of March 2011. The economic analysis was carried out on the basis of a comparison of the with- project and without-project situations. The 31 selected road projects were evaluated using a benefit period of 20 years among the 40 sample selected roads, which was the economic life assumed at appraisal. The RRP had assumed that the IRI would be kept at 2 for the evaluation period. However, the average IRI of the 31 road sections was 3.3, ranging from 2.44 at appraisal to 4.90 in December 2010. The PPER used a set of assumptions on road condition where the IRI will be at 3.3 until the end of the evaluation period. The PPER’s average EIRR for the 31 road sections is 27.8%, ranging from 7.7% and 70.6%. Three of the 31 roads sections did not reach the EIRR threshold of 12%. The EIRRs for most road sections were lower than estimated in the RRP. This means that some parameters like traffic volume and the IRI were overestimated in the RRP (Table A5.5 of Appendix 5).

61. The pavement design for the 780 km of rehabilitated roads specified double bituminous surface treatment (DBST). The DBST is a low-cost pavement type and appropriate for local roads in Sri Lanka. However, it has a shorter lifetime than asphalt concrete pavement and, depending on the traffic volume, requires surface dressing every 3–5 years, accounting for about 50% of civil work costs. These costs were not considered in the economic analysis of the RRP. The Western PRA evaluated the lifetime of the DBST at 8 years. It is true that some rehabilitated road sections started deteriorating prematurely because of a significant increase in

<sup>19</sup> (i) Group A, high traffic flow of 1,000 motorized vehicles, medium traffic flow of 500 motorized vehicles, and low traffic flow of 250 motorized vehicles; (ii) group B, high traffic flow of 500 motorized vehicles, medium traffic flow of 250 motorized vehicles, and low traffic flow of 120 motorized vehicles; and (iii) group U, high traffic flow of 750 motorized vehicles, medium traffic flow of 375 motorized vehicles, and low traffic flow of 188 motorized vehicles.

<sup>20</sup> (i) Group A is defined as “connectors” that connect a primary road (Class A and Class B) with another primary road; (ii) group B is defined as “penetrators” that serve remote areas as sole spur off another national or provincial road; and (iii) group C is unsealed surface roads.

<sup>21</sup> TA 2904-SRI consultants developed their cost estimates for the category analysis. They defined the upper, middle, and lower tiers and established unit costs per square kilometer for three categories.

<sup>22</sup> Although the PCR did not have sufficient data for economic analysis—traffic counts for 110 of the 150 projects roads were done before project completion in 2007, and estimates of traffic data were derived from traffic movement on similar roads nearby with reliable traffic counts—the PCR stated that its efforts were a substantial improvement over the situation at appraisal, when reliable traffic data were available for only 52 roads.



traffic, especially of heavy vehicles; they are NC-3 Kothalawala, NC-5 Medirigiriya–Chaittya, NW-32 Hendiyapola–Deduruoya, WP-117 Oruwela–Mullegama, WP-137 Kerawalapitiya–Mahabage, and WP-149 Pelanwatta–Kosgahahena. Therefore, a 20-year evaluation period is not a realistic parameter for an economic evaluation. The PPER changed the evaluation period from 20 to 10 years in the sensitivity analysis but kept the other parameters the same. With a reduced economic life cycle, the EIRR dropped to 20.1% and the individual EIRRs ranged from –2.5% to 68.2%. The EIRRs of three of the 31 road sections were negative. In addition, 19 of the 31 road sections had recalculated EIRRs lower than 12%. More than 60% of the 31 road sections became less efficient, even though the selection method gave priority to the economic impact. (Appendix 6)

62. For the implementation of the investment component, ADB records indicate that ADB proceeded in an efficient manner and that delays in project implementation were not due to ADB. ADB responded quickly and positively to requests from ministries, consultants, and the PRAs. From a government, consultant, and contractor perspective, efficiency of implementation was constrained by some factors beyond their control, such as lack of qualified staff, cumbersome procedures in consultant recruitment and tender evaluation, and shortcomings in the project design as noted above. Nevertheless, implementation efficiency was satisfactory in view of the constraints. Rehabilitation of provincial roads covered 780 km against 980 km expected at appraisal. The cost of the provincial roads component was more than 30% above the estimated amount. The unit rehabilitation cost increased by 64% from \$76,400/km to \$125,300/km. The last rehabilitation contract was finished in August 2008 and required a loan extension of 6 months to the end of 2008.

63. Implementation of the capacity development subcomponent was less efficient (para. 56). The design of the implementation arrangements was cumbersome and inefficient. Therefore, ADB should provide more careful guidance on how to implement and monitor the project in detail. ADB's attention and careful support, and the executing and implementing agencies' ownership were not sufficient for efficient implementation of the Reform Program.

## **E. Sustainability**

64. The PPER rates the project *less likely* sustainable. The REAPs intended to increase road maintenance financing, and streamline road maintenance budgeting and expenditure control, by establishing a road maintenance funding system. The RMTF was established but there is yet no arrangement for direct contribution to the fund from a fuel levy. The RMTF operates only as a separate budget item, and the intended outcome of having a road fund so as to have total control in fund disbursements have not materialized. The extension of a road fund to the provinces has not occurred due to initial opposition by the provincial councils (paras. 39–41).

65. The actual funding for maintenance of provincial roads remains at around 40%–70% of the required budget. The Uva PRA maintains about 1,750 km of provincial roads and needs \$4 million for routine and periodical maintenance in 2011. It told the independent evaluation mission that the World Bank finances \$2.8 million and the government budget finances the balance in 2011. The amounts to be financed by the World Bank will reduce gradually year by year. Establishment of a self-reliant road funding mechanism is an urgent necessity for sustainability of the road infrastructure (Appendix 7).

66. The PCR assumed that maintenance will keep the IRI value within the bounds of the base-year level i.e., IRI = 2. The average IRI of the 31 road sections in 2011 was around 3.3.

The road condition has been worse than this assumption. Taking into account the insufficient maintenance budget of the RDA and the PRAs, the IRI will keep increasing and the roughness and condition of the projects roads will deteriorate further. Moreover, poor maintenance reduces the life of the project, and has an adverse impact on ride quality, VOC, and longevity of road assets. These affect EIRR negatively as well. 66. The Reform Program was envisaged to create a comprehensive and competitive maintenance system, the RMMS, for efficient and streamlined road maintenance. However, the program failed in establishing the RMMS, because the RMBEC developed by TA 3691-SRI (footnote 18) had malfunctions in its program and could not be fully operational, and the bridge maintenance system and pavement management system could not be added to the RMMS, due to the malfunctions of the RMBEC. No alternative systems have been proposed or developed.

67. It was envisaged that the project would transform the selected four PRAs into efficient and streamlined organizations. The IDP tried to develop systems for planning, budgeting, and maintenance—such as information and communication technology tools, engineering software for detailed design work, project management and monitoring software, and programming and expenditure control of the road maintenance budget. A road inventory was completed to assist data collection. However, technical problems in updating the information have not been corrected and this database is now outdated and unusable. None of the targeted systems to support maintenance has been developed by the project. As the main consultant is based in Colombo at the MLGPC, the consultant had much less direct interaction with the four provincial road agencies, resulting in less effective assistance (para. 40 of the RRP of Loan 2546-SRI[SF]).<sup>23</sup> Some of the PRAs said that the provided systems were not useful and user-friendly; however, the development process became a good training for them and they were able to acquire capacity to develop their own systems.

68. One of the achievements was the reorganization of the RDA and the PRAs (para. 26). The PCR evaluated the reorganized RDA (from 16 to 5 functional divisions) as a streamlined structure. However, although 5 assistant director-general posts were created, 16 posts of divisional director still exist and the desired streamlining is not yet achieved. To be an efficient and sustainable organization, this redundancy needs to be rectified. The proposed new structure of the PRAs mirrors the structure of the RDA, and management in each of the PRAs was streamlined and job descriptions adjusted. However, there is still a shortage of qualified staff to fill newly created positions. If the government is able to fill vacant positions in the RDA and the PRAs with qualified staff, the reorganization will be sustainable.

#### IV. OTHER ASSESSMENT

##### A. Impacts

69. The project impact is rated *partly satisfactory*. For the physical investment, field assessments showed that people who had assets benefited from the project since they could improve the productivity of those assets. However, the Reform Program did not achieve the envisaged outcomes. TA 4075-SRI also did not achieve the envisaged outcomes since the TA did not produce any outputs.

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<sup>23</sup> ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Eastern and North Central Provincial Road Project*. Manila (Loan 2546-SRI[SF], approved on 16 September).

70. The RRP included a project framework with 9 monitoring indicators associated with the project's outputs. The project framework is nonetheless relevant to assessing effectiveness. The PPER assessed 1 of the 9 targets as achieved; 4 of the 9 targets as partly achieved; and 4 of the 9 targets as not achieved.

71. **Impact on institutions.** Although the Reform Program did not achieve the envisaged outputs, the project still contributed to institutional strengthening by reorganizing the RDA and the PRAs, strengthening the preconstruction and construction processes, and encouraging private sector participation. The RDA increased its capacity to handle civil work from about \$10 million in 2000 to \$200 million in 2010. Western Province strengthened its institutional capability, and the MLGPC asked Western Province to rehabilitate other provinces such as North Western and Sabaragamuwa provinces. The Uva PRA strengthened its capacity through on-the-job training and developed software to manage the maintenance budget by itself.

72. **Socioeconomic impact.** IED carried out a rapid social survey to measure socioeconomic impact on 10 selected road sections in four provinces that were rehabilitated under the RSDP (Appendix 8). Since the road sections were very short and given that 150 road segments were spread over four different provinces (para. 24), significant qualitative improvements were not difficult to measure. However, the project appears to have provided better transportation facilities such as bus services; better access to schools, health centers and areas of economic activity; and an increase in economic activities and property values. Better roads have boosted opportunities for social interaction between households. Public transportation has become more available along the project roads, and this is significant because of the low vehicle ownership in the project areas. Economic impacts include (i) higher land values, (ii) growth in small-scale businesses and higher incomes for the existing roadside shops, (iii) greater agricultural production, (iv) shorter travel time to market areas, and (v) better housing and living standards. The higher land values were considered the most significant economic impact from the project, although these incomes do not add to GDP because land sales are transfer payments. In some areas property values have doubled. Increases in income reported by the survey respondents were highest in North Western Province. A full socioeconomic assessment is in Appendix 8.

73. **Resettlement and environmental impact.** Since the project rehabilitated existing roads in the existing alignments, very little land acquisition was required and resettlement was minimal. With ADB assistance, resettlement activities were satisfactory and no pending resettlement issues were reported. The environmental safeguard requirements were generally complied with during project preparation. Damage to drains, streams, and rivers was generally minimal and the original conditions were restored. Borrow and storage sites which generated dust and siltation during construction were restored. The project produced no major long-term negative environmental impacts.

## **B. Asian Development Bank Performance**

74. The PPER rates the performance of ADB *partly satisfactory*. ADB undertook 11 missions to monitor, supervise, and administer the project. In addition, several multi-project review and consultation missions intensified interaction with the project agencies. On 14 November 2006, the project was delegated to the Sri Lanka Resident Mission. In general, ADB responded quickly and positively to requests from the RDA, the PRAs, the government ministries, and consultants.

75. **Project preparation.** Project objectives were ambitious, and there were several areas where design and implementation could have been more effective, especially in the Reform

Program. Although the REAPs and the IDP were key documents for project implementation, they were not presented in the RRP and project administrative memorandum (paras. 26 and 55). The absence of the plans would make it difficult for implementation agencies to have a clear idea and ownership of the Reform Program, and for ADB to properly monitor progress of the program. The RRP mentioned that the simplified economic and socioeconomic evaluation was carried out for the screening of candidate roads and selection of the project road sections (para. 46). However, the selection did not give priority to social development impacts (paras. 47 and 48). It is also unclear how the final selection of the 182 road sections was done (para. 49). The project used the hypothetical data for economic analysis at appraisal, as previously discussed, although the HDM-4 requires precise data (para. 59). The RRP should have described the applied hypothesis of the analysis in more detail. For TA 4075-SRI, ADB did not succeed in engendering ownership by the implementation agency and the TA was rated *unsuccessful* in the TA completion report.

76. **Administration.** Many of the Reform Program targets were not achieved. Fielding the reform consultants for the REAPs was delayed by about 4 months owing to protracted negotiations with the initially first-ranked consulting firm. However, work on the REAPs was completed 5 months before the scheduled end of the contract, in March 2007. More careful monitoring and supervision of the Reform Program would have been necessary to understand the key issues of the institutional capacity development, design and implement necessary changes, and/or propose alternative approaches. The memoranda of understanding between the government and ADB during project implementation did not cover all the targets of the Reform Program. TA 4075-SRI achieved about 35% in length but the consultant firm received 80% of the payment. With more careful monitoring and advice, the efficiency of TA implementation could be improved.

### C. Borrower Performance

77. The PPER rates the performance of the borrower and the executing agencies *partly satisfactory*. The loan agreement was signed within 2 months of ADB Board approval. RDA published the recruitment notice for the reform consultants in March 2003 but the contract was signed on 7 September 2004. It took 488 days from the expression of interest for the executing agency and the selected firm to sign the contract. For the national highway design consultancy, it took the parties 395 days from the expression of interest to sign the contract. As for the recruitment of the implementation consultants, it took 332 days to sign the contract. The MLGPC completed 54 civil works contracts, not the 71 contracts foreseen at appraisal. These national competitive bidding contracts were awarded to 17 national contractors. There were delays in procurement for the recruitment of the consulting firm but the procurement of the project was generally smooth.

78. There were several unforeseeable events, including shortages of quarry aggregates, bitumen, labor, and other needs because of the tsunami. The last contract was finished in August 2008, requiring a loan extension of 6 months to the end of 2008 and leaving the defects liability period for some contracts outside the loan closing date. This extension was the minimum required and the executing agency and the implementing agency managed the project well in this period.

79. There was lack of ownership of the Reform Program and the program was implemented on the initiative of the recruited consulting firm. Progress of the REAPs and the IDP was not carefully monitored. The RDA was unable to fill many positions in the head office and provincial offices, and the government's inability to ensure sustainable maintenance funding as required

by the loan conditions was a major and critical lapse. There is still a shortage of qualified staff to fill positions in the PRAs. If the government is able to fill vacant positions in the RDA and the PRAs with qualified staff, the reorganization will be efficient and sustainable. The RDA and the PRAs still need to put in considerable effort to find qualified staff.

#### **D. Technical Assistance and Consulting Services**

80. The project included consulting services for a detailed engineering design of national highways and for TA 4075-SRI. These consulting services were incomplete (paras. 27 and 28).

### **V. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS**

#### **A. Issues and Lessons**

81. **Project design.** At appraisal, the difficulty of implementing the Reform Program could have been foreseen; special measures for monitoring and supervision should have been proposed in the RRP, and specific milestone requirements to check the progress of the Reform Program should have been set. The design of the project was complex, with numerous components (para. 45). Para. 56 also discussed why the Reform Program could not achieve two-thirds of the targets.

82. **Selection of the project roads.** Necessary data should be collected for the project roads, and the selection methodology should have been a sound logical and scientific tool to shield it from political pressure. An earlier project, the Southern Provincial Roads Improvement Project,<sup>24</sup> had carried out the selection of provincial roads. The PPTA for the RSDP took a similar approach for the selection of provincial roads. The ongoing Road Project Preparatory Facility (footnote 12) has been preparing feasibility studies for about 3,000 km of provincial roads. The selection methodology used for the RSDP failed to consider the social development impact as the foremost factor, even though poverty alleviation was a major objective. The MLGPC implemented the provincial road selection at least three times with ADB financing assistance, but the selection methodology was not reviewed in the RSDP's PCR. These were the issues with the selection of the project roads: (i) limited data for traffic counts and road condition data (para. 47); (ii) the selection methodology did not clearly link the priority roads to poverty alleviation, as the five criteria and the combination ratio gave priority to the economic impact (para. 48); and (iii) according to the final report of the PPTA, 296 provincial roads were selected, but the RSDP selected only 52 of those (para. 49). In addition, some priorities changed for reasons that appeared more political than based on economic and social considerations (para. 49).

83. **Economic analysis.** An appropriate method for economic justification should be carefully examined at appraisal. The economic analysis should have used observed data instead of the desktop estimation, and should be assessed based on sound assumptions. A least-cost analysis would have been feasible for small roads where an EIRR is not an appropriate indicator because, among others, (i) the assumption that traffic simply increases year by year is not applicable to all provincial roads; (ii) for some road sections, social development has been given more priority than economic impact; and (iii) not all selected roads are economically efficient even though the selection method gives priority to the economic

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<sup>24</sup> ADB. 1997. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Southern Provincial Roads Improvement Project*. Manila (Loan 1567-SRI[SF], approved on 30 October).

rather than the socioeconomic impact. However, it should be noted that a least-cost analysis would not have been an adequate indicator of efficiency, because efficiency is determined primarily by the extent to which roads are maintained once they are rehabilitated. With little or no maintenance, as is usually the case in Sri Lanka, the life of a rehabilitated road decreases substantially, resulting in reduced economic benefits and inefficient outcomes. Therefore, a least-cost analysis may not reflect this.

84. The RRP explains that preliminary traffic counts on selected roads were supplemented by conducting a 2-day, 12-hour count. However, only 102 traffic counts were implemented in July 2000, and these traffic data were not directly used in the economic analysis for the observed road sections (para. 59). After project completion, no traffic volumes or road roughness data had been collected, which were the exclusive elements to calculate the VOC and economic benefit. The PCR raised the issue of the reliability of the traffic volume used in the economic analysis at appraisal, as it had reliable data for only 52 roads. After project completion, no traffic volumes or road roughness information were collected and the PCR still did not use observed traffic data and road roughness index data after the project completion (para. 60).

85. Another issue was the evaluation period. The lifetime of the DBST is less than 10 years, and it requires surface dressing every 3-5 years, the costs for which amount to about 50% of the original rehabilitation costs (para. 62).

86. **Monitoring of the Reform Program.** More careful monitoring and supervision would have been required to review the progress of the program, to understand its key issues, and to propose alternative approaches where necessary. The design of the Reform Program with its numerous components was complex, so efforts on monitoring and guidance should have been made during project implementation. This was not done by ADB. Many targets of the Reform Program were not achieved, and neither ADB nor the implementing agencies reviewed the issues that prevented achievement. Almost all memoranda of understanding between the government and ADB, as well as monthly progress reports prepared by the consultants during project implementation, were not comprehensive and did not cover all targets of the Reform Program. Hence, the PCRs of ADB, the RDA and the MLGPC could not evaluate all the activities of the Reform Program. The main consultant was based in Colombo at the MLGPC and as such did not have much direct interaction with the four PRAs, resulting in less effective monitoring of progress. With careful monitoring and attention, the number of successful targets and the quality of capacity building could have been greater and activities of the Reform Program could have been more user-oriented.

87. **Selection of consultants.** The requirements, key issues, terms of reference, selection criteria including qualification of consultants, implementation structure, and understanding and ownership of the TA by the implementing agencies should have been described carefully according to the requirements of technical assistance. If poor performance was observed, prompt action would have been required to minimize the loss of time and funds. The consultancy services for the detailed engineering design of national highways and TA 4075-SRI were incomplete due to poor performance by the consultants and did not provide significant outputs. The RDA also should have developed a well-maintained performance recording system.

## B. Follow-Up Actions

88. **Selection methodology.** Since rehabilitation of provincial roads is still a priority, ADB should review its practices and develop a sound selection methodology before next financing rehabilitation of provincial roads.

89. **Economic reevaluation.** Traffic counting and road roughness measurements should be carried out as soon as possible, so that economic reevaluation can be fully performed. Recording of traffic and road roughness data should be recorded periodically to provide feedback for future investment in provincial roads. These data can also be used for road maintenance. These actions should be taken by the MLGPC under ADB's guidance. In addition, considering the lifetime of the DBST and the required surface dressing, ADB should set proper parameters for the economic analysis. This reevaluation should also be taken as feedback for the review of the selection methodology. The evaluation assumptions, including the evaluation period and recurring costs, should be reviewed and revised to make them realistic.

90. **Reform Program.** ADB should review the current status of the institutional capacity of the RDA and the PRAs, and propose follow-up actions regarding the unachieved targets, as soon as possible. Ongoing TA projects such as Capacity Development of the Provincial Road Agencies (TA 7347-SRI)<sup>25</sup> and Capacity Development of the Northern Provincial Road Development Department (TA 7545-SRI)<sup>26</sup> are implementing similar reform activities in the other provinces. ADB should share the result of the IDP review with these provinces.

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<sup>25</sup> ADB. 2009. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Capacity Development of the Provincial Road Agencies*. Manila (TA 7347-SRI, approved on 16 September); attached to ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant for the Eastern and North Central Provincial Road Project*. Manila (Loan 2546-SRI[SF], approved on 16 September).

<sup>26</sup> ADB. 2010. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Capacity Development of the Northern Provincial Road Development Department*. Manila (TA 7545-SRI, approved on 18 June); attached to ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Technical Assistance Grant for the Northern Road Connectivity Project*. Manila (Loan 2639-SRI and Loan 2640-SRI[SF], approved on 24 May).

## PROJECT ACHIEVEMENTS AGAINST INTENDED IMPACTS, OUTCOMES, AND OUTPUTS

Design Summary	Performance Targets	Assessment	Project Achievements
<b>Impact</b>			
Economic development and poverty reduction in project target areas.	<p>Increased per capita income in provinces and districts.</p> <p>Improved rural income and employment rates at district, village, and household levels.</p> <p>Increased contribution of the four provinces to the country's GDP.</p>	Three targets were achieved, although there is no clear link to the project.	<p>Real GDP of North Central and North Western provinces significantly increased and at rates faster than the GDP growth for the entire country. GDP growth in Western Province has been erratic, posting double-digit growth in 2006 but contracting in 2007. By and large the economic expansion of the four provinces from 2003 to 2008 has been faster on average than that for the entire country. While this economic expansion cannot be attributed to the project roads, these roads did contribute to brisker economic activity.</p> <p>The poverty head count ratios for the four provinces also dropped significantly from 2002 to 2007. Except for Uva Province, their poverty head count ratios are all below that of the country.</p> <p>Except for Western Province, the project provinces' contribution to the national GDP has been increasing. The contribution of Western Province, although declining, has been kept at over 45%.</p>
<b>Outcome</b>			
Efficiently functioning road sector in Sri Lanka.			
Strengthened national and provincial road institutions to perform their core role of strategic management and planning of the road network.	Improved road planning, programming, contract management and implementation, land acquisition and resettlement, and road maintenance system.	Partly achieved.	These were supposed to be achieved with the implementation of the REAPs and the IDP. However, not all the REAPs were implemented and those that were, were not implemented completely.
Improved domestic capacity for road construction and engineering services.	<p>Increased freight and passenger flows and access to economic and social services in the project areas.</p> <p>Increasing proportion of RDA work carried out by the domestic private sector.</p> <p>Reduced travel time and transport services in the project areas.</p> <p>At least 40% of provincial roads in project areas in maintainable standard.</p> <p>Improved quality and cost effectiveness of road construction</p>	<p>Achieved.</p> <p>Achieved.</p> <p>Achieved.</p> <p>Partly achieved.</p> <p>Partly achieved.</p>	<p>There has been an increase in passenger and freight traffic on the project roads.</p> <p>As a result of the 20 pilot projects that were subcontracted to the private sector, 75% of the periodic maintenance is now done by the private sector. Routine maintenance is normally force-account work.</p> <p>Based on the socioeconomic survey carried out by the independent evaluation mission, the reduction in travel time is one of the major benefits from the project. Less time is now needed to travel to the town center and to other areas of interest.</p> <p>The road maintenance trust fund has not supported provincial roads as envisaged, and maintenance funds are still not sufficient.</p> <p>Not all the REAPs and the IDP related to road maintenance were completed.</p>



Design Summary	Performance Targets	Assessment	Project Achievements
	and maintenance works.		
<b>Outputs</b>			
Private sector participation	By 2008, 75% of consolidated fund roadworks to be contracted out	Achieved.	By 2004, 80% of the consolidated fund roadworks were contracted out.
Implementation of the REAP under the time frames agreed with ADB.	By 2005 all action plans should have been implemented.	Partly achieved.	Not all the REAPs and the IDP were implemented and some of those implemented were not completely implemented (details of the REAP implementation are in Appendix 2).
Strengthened PRAs.	Established interprovincial coordination by 2004.	Not achieved.	A capacity development component for the IDP was not fully implemented due to the cost overruns of the provincial roads component. The engineering software and the project management and monitoring software, if implemented, are nowhere to be found. Although the road maintenance budget increased in 2004 as covenanted, the road maintenance financing mechanism that was supposed to be in place by 2005 was not completed.
	Institutional development program completed by 2005.	Partly achieved.	
Strategic roads improvement	Establishment of an interministerial committee to guide and approve the streamlined procedures.	Not achieved.	No action was taken.
	Rehabilitation of about 980 km of roads and bridges.	Partly achieved.	780 kilometers of roads and bridges were rehabilitated.
	Improvement of 40 km of community access roads.	Not achieved.	This was dropped from the project due to shortage of funds.
Design of national highways	Completion of design of national roads development by 2004.	Not achieved.	Consultants were not able to submit acceptable outputs. The work is being done under a different project. <sup>a</sup>
	Detailed engineering design for 411 km of national highways, with tender documents, resettlement and utility relocation plans, and environmental and social studies.	Partly achieved.	A detailed design was completed for 130 km of national highways but resettlement and utility relocation plans, and environmental and social studies were canceled.

ADB = Asian Development Bank, GDP = gross domestic product, IDP = institutional development program, km = kilometer, LAR = land acquisition and resettlement, PRA = provincial road administration, RDA = Road Development Authority, REAP = reengineering action plan.

<sup>a</sup> ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Road Project Preparatory Facility*. Manila (Loan 2080-SRI[SF], approved on 13 April).

Sources: ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December); and independent evaluation mission.

## APPRAISAL AND ACTUAL PROJECT COSTS

Table A2.1: Project Capital Cost  
(\$ million)

Item	Appraisal			Actual			Actual/ Appraisal (%)
	Foreign Currency	Local Currency	Total Cost	Foreign Currency	Local Currency	Total Cost	
<b>Base Cost</b>							
<b>Reform of National Highways</b>	<b>2.7</b>	<b>0.8</b>	<b>3.5</b>	<b>2.2</b>	<b>0.9</b>	<b>3.1</b>	<b>88.6</b>
Consulting services	1.5	0.4	1.9	1.4	0.4	1.9	100.0
Equipment and training	1.2	0.1	1.3	0.8	0.5	1.3	100.0
IAC	0.0	0.3	0.3	0.0	0.0	0.0	0.0
<b>Strengthening of Provincial Roads</b>	<b>2.8</b>	<b>1.0</b>	<b>3.8</b>	<b>2.4</b>	<b>0.9</b>	<b>3.3</b>	<b>86.8</b>
Consulting Services	2.0	0.4	2.4	2.0	0.0	2.0	83.3
Equipment and training	0.8	0.2	1.0	0.4	0.7	1.1	110.0
Office buildings	0.0	0.2	0.2	0.0	0.2	0.2	100.0
IAC	0.0	0.2	0.2	0.0	0.0	0.0	0.0
<b>Provincial Roads Improvement</b>	<b>21.5</b>	<b>49.4</b>	<b>70.9</b>	<b>29.0</b>	<b>64.3</b>	<b>93.3</b>	<b>131.6</b>
Road and bridge rehabilitation	18.8	43.7	62.5	21.6	61.9	83.5	133.6
Community access	0.0	0.4	0.4	0.0	0.0	0.0	0.0
Consulting services	2.7	4.3	7.0	7.4	0.0	7.4	105.7
IAC	0.0	1.0	1.0	0.0	2.4	2.4	240.0
<b>Design of National Highways</b>	<b>0.7</b>	<b>0.3</b>	<b>1.0</b>	<b>0.4</b>	<b>0.6</b>	<b>1.0</b>	<b>100.0</b>
<b>Subtotal Base Cost</b>	<b>27.7</b>	<b>51.5</b>	<b>79.2</b>	<b>34.0</b>	<b>66.7</b>	<b>100.7</b>	<b>127.1</b>
<b>Physical Contingencies</b>	<b>1.9</b>	<b>4.5</b>	<b>6.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Price Contingencies</b>	<b>1.6</b>	<b>3.7</b>	<b>5.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Interest During Construction</b>	<b>1.6</b>	<b>0.0</b>	<b>1.6</b>	<b>1.4</b>	<b>0.0</b>	<b>1.4</b>	<b>87.5</b>
<b>Total</b>	<b>32.8</b>	<b>59.7</b>	<b>92.5</b>	<b>35.4</b>	<b>66.7</b>	<b>102.2</b>	<b>110.5</b>

IAC = incremental administration cost.

Source: Independent evaluation mission.

Table A2.2: Financing Plan  
(\$ million)

	Appraisal			Actual		
	Foreign Currency	Local Currency	Total Cost	Foreign Currency	Local Currency	Total Cost
Asian Development Bank	24.3	32.2	56.5	27.6	32.7	60.3
OPEC Fund	8.5	0.0	8.5	7.8	0.0	7.8
Government	0.0	27.5	27.5	0.0	34.4	34.4
<b>Total</b>	<b>32.8</b>	<b>59.7</b>	<b>92.5</b>	<b>35.4</b>	<b>66.7</b>	<b>102.2</b>

OPEC = Organization of the Petroleum Exporting Countries.

Source: Independent evaluation mission.

Table A2.3: Cost per Kilometer of Roads at Appraisal and Actual

Province	Appraisal				Actual			
	Cost \$ million	km	\$/km	Bridges No.	Cost \$ millions	km	\$/km	Bridges No.
North Central	12.4	218.8	56,535.6	30	12.3	175.8	69,997.6	18
North Western	15.2	256.5	59,259.3	27	18.6	216.8	85,682.4	14
Uva	18.0	280.5	64,278.1	45	20.9	175.3	119,318.9	27
Western	16.9	225.8	74,845.0	24	24.8	202.6	122,361.0	14
<b>Total</b>	<b>62.5</b>	<b>981.6</b>	<b>63,671.6</b>	<b>126</b>	<b>76.6</b>	<b>770.5</b>	<b>99,407.7</b>	<b>73</b>

km = kilometer.

Source: Independent evaluation mission.

## STATUS OF THE REFORM PROGRAM AND OTHER TECHNICAL ASSISTANCE

**Table A3.1: Reengineering Action Plans (National Highway Provision)**

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
REAPs		No REAP was found in the RDA. The actual expenditure on REAPs was \$3.0 million against \$3.5 million of the original plan. (GPCR[R])	No REAP was found in ADB's project records. The reorganized RDA became a streamlined structure with 5 instead of 16 functional divisions. A series of highly relevant concept papers, guidelines, and manuals have been developed under the various REAPs. (PCR)	The REAPs were not found in the project records of ADB and the RDA. Five assistance director-general posts were created, but 16 posts of divisional director continue to exist and the desired streamlining has not yet been achieved. Some of the concept papers, guidelines, and manuals were not found or used by the RDA.
<b>1. Strengthening of Planning and Programming</b>				
Establishment of planning division data collection unit	CS	The consultants prepared a data collection program. (GPCR[R])	<i>No information is available.</i>	Completed. The traffic and axle data collection unit was transferred from the Engineering Services Division of the RDA.
Data collection unit fully trained and operational	CS	The consultants provided training on data collection procedures. (GPCR[R])	Two cycles of data collection survey were completed. (AMR)	Completed.
Completion of road network model	CS		Inventory, condition data, and inter-district transport model were completed. (AMR)	Not completed.
Approval of level of service standards	CS		Not appropriate. (AMR)	Not completed.
Completion of economic analysis manual and training	CS, EQ	The consultants assisted in installation of the HDM-4. The consultants prepared a manual for economics-based planning and trained the RDA staff. (GPCR[R])	Done but not comprehensively. (AMR)	Not completed. The RDA reported that the manual on economic analysis provided by the consultants was not adequate. The consultants assisted installation of the HDM-4 and provided training.
Preparation of medium-term road program	CS, LC		LC was complied with. (PCR)	Not completed. It was not clear for the RDA what this action was.
Completion of highway master plan	CS, LC		LC was complied with. (PCR)	Partially completed. TA 4315-SR1: Road Sector Master Plan <sup>a</sup> prepared a draft road sector master plan. The REAP helped finalize the master plan.
<b>2. Strengthening of Pre-Construction Processes</b>				
Start of review and revision of RDA processes	CS	The consultants updated the standard construction norm for estimation of road and bridge construction	The consultant drafted pre-construction process strengthening concept paper and reviewed RDA's current procedures. (AMR)	Not completed. The concept paper was not found.

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
		works with RDA. (GPCR[R])		
Approval of chairman to revised processes	CS, LC		The RDA adopts preconstruction process. The RDA adopted and completed bidding process to invite bids from private firms for the pilot project (AMR). LC was complied with. (PCR)	Completed.
Start of pilot projects	CS		<i>No information is available.</i>	Completed. 20 pilot projects for private sector were initiated.
Pre-construction processes operational	CS, LC		LC was complied with. (PCR)	Completed. Processes and documents are adopted in competitive bidding process.
<b>3. Strengthening of Construction Management</b>				
Appointment of private sector representatives and consultant to assist the RDA	CS		<i>No information is available.</i>	Not completed.
Completion and adoption of construction management system	CS, LC	The consultants developed a construction management system. (GPCR[R])	Training and construction management manual were provided. (AMR) LC was complied with. (PCR)	Completed.
Completion of training, construction management system operational	CS		New construction management procedures were introduced.	Completed.
<b>4. Strengthening of Road Maintenance Management</b>				
Establishment of maintenance management unit	CS	Maintenance Management Unit was established. (GPCR[R])	To be done. (AMR)	Partially completed. The Maintenance Division, which had existed, has just been renamed Maintenance Management and Construction Division
Completion of maintenance and contracting study	CS		Not in the TOR. (AMR)	Not completed.
The RMMS using the RMBEC fully operational in 2003	CS, LC	The consultants failed to complete this task. (GPCR[R])	Unable to implement this (AMR). The consultant replaced the RMBEC with the HDM-4. (PCR)	Not completed. The RMBEC was developed by TA 3691-SRI <sup>b</sup> . However, the RDA used it for a year and then rejected it due to a malfunction in the software. The maintenance budget of national roads has been manually managed since then.
Completion of the PMS, the BMS, and training	CS, LC		The consultants informed that BMS cannot be included in RMBEC. LC was complied with for PMS. (PCR)	Not completed. The RDA reported that the PMS and the BMS were not developed.
Completion of road maintenance management system in field	CS, LC	HIMS {?} was installed and training was provided. (GPCR[R])	Road condition at the end of year is reviewed by province and budgeting for the next year is done (AMR). LC was complied with. (PCR)	Not completed. No concrete system under the RMMS concept exists for dissemination, except for the HDM-4.
<b>5. Establishment of Technical Audit</b>				

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
Development of technical audit processes	CS, LC	The technical audit unit was established. (GPCR[R])	LC was not complied with. (PCR)	Not completed.
Adoption of audit program and establishment of audit unit	CS, LC		LC was partly complied with. The technical audit unit has been established in the RDA, but the RDA has yet to finalize the functions and the name for the proposed unit, or appoint or assign staff. (PCR)	Not completed. The unit was nominally established but is not functioning effectively.
<b>6. Development of RCDC</b>				
Award of first-year contracts and appointment of supervision team	CS		<i>No information is available.</i>	Completed. The RCDC subcontracted 20 projects to the private sector and provided technical supervision.
Appointment of technical assistance team to contractors	CS		<i>No information is available.</i>	Not completed.
Preparation of business plan for consulting engineering companies	CS		<i>No information is available.</i>	Not completed.
Formation of new consulting engineering companies	CS, LC		LC was complied with. Former RCDC staff absorbed by the private sector. (PRC)	Not completed.
Award of First Consulting Contracts	CS		<i>No information is available.</i>	Not completed.
<b>7. Development of Private Sector</b>				
Establishment of the PPPTF	CS		<i>No information is available.</i>	Partially completed. The committee was set up for the closure of the RCDC and development of the private sector. The members have met a few times and stopped after closure of the RCDC. This is possibly the reason why following targets were not achieved.
Development and implementation of options to overcome plant/machinery availability constraints	CS, LC		LC was partly complied. (PCR)	A study for the development and implementation of options to overcome plant and/or machinery availability constraints was done after the project was completed and funded by the RDA. However, the study has not been used.
Selection of first-year projects for contracting to domestic contractors	CS		<i>No information is available.</i>	Completed. The RCDC subcontracted 20 projects to the private sector and provided technical supervision.
Call for tenders and establishment of supervision team for first-year contracts	CS		<i>No information is available.</i>	Not completed.
Award of first-year contracts and commencement of construction	CS		<i>No information is available.</i>	Not completed.
Award of first contracts by the RDA directly to private contractors	CS		<i>No information is available.</i>	After closure of the RCDC, 80% of locally funded RDA road works are handled by the private sector on contracts awarded directly by the RDA.
Contractor training through the	CS,		LC was complied with. (PCR)	Not completed.

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
Institute of Construction Training and Development	LC			The RDA said that this was not done by the project.
Completion of feasibility studies of Contractor Funding and Plant Hire Company	CS		<i>No information is available.</i>	Not completed.
Establishment of the RDA Aggregate Supply Information Unit	CS, LC		LC was complied with. (PCR)	Not completed. The RDA said that this was not done by the project.
The RDA awards first contracts for consulting services	CS		<i>No information is available.</i>	Not completed.
Developing options to overcome plant availability constraints	CS, LC		<i>No information is available.</i>	Not completed.
Support for the RCDC and the RDA staff to set up independent, private consulting engineering firms	CS, LC		<i>No information is available.</i>	Not completed. The RDA said that this was not done by the project.
RDA contracts out consolidated fund for civil works to private sector (a) SLRs1 billion in 2002 (b) SLRs1.5 billion in 2003 (c) SLRs2 billion in 2004 (d) Role of the RCDC will end in 2005 (e) 50% of the RDA works in 2006 (f) 75% of the RDA works in 2008	CS, LC	RCDC was closed and all functions of RCDC are being done by RDA's newly established work division. (GPCR[R])	PCR: (a) No information is available. (b) LC was complied with (c) LC was complied with (d) RCDC was closed in 2004 (e) LC was complied with (f) LC was complied with	(a) Completed. (b) Completed. (c) Completed. (d) RCDC was closed in 2004. (e) After RCDC closure, this reached 80%. (f) After RCDC closure, this reached 80%.
<b>8) Establishment of Inter-Provincial Coordinating Committee</b>				
Appointment of an implementation officer	CS		<i>No information is available.</i>	Not completed.
Review and approval of steering committee report	CS		<i>No information is available.</i>	Not completed.
Appointment of coordinating committee	CS		<i>No information is available.</i>	Not completed.
<b>9) Establishment of National Road Research and Training Institute</b>				
Cabinet approval of proposal to establish NRRTI	CS		<i>No information is available.</i>	Not completed.
Parliamentary approval of NRRTI statute	CS		<i>No information is available.</i>	Not completed.
Appointment of board of management of the NRRTI	CS		<i>No information is available.</i>	Not completed.
Completion of construction of NRRTI (building option)	CS		<i>No information is available.</i>	Not completed.
<b>10) Road Funding</b>				
Completion of initial review of maintenance budgeting and expenditure	CS		<i>No information is available.</i>	Completed.

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
Introduction of RMBEC process	CS		<i>No information is available.</i>	Not completed. The RDA used the RMBEC but rejected it after 1 year.
Proposal for a sustainable road maintenance funding mechanism	CS		<i>No information is available.</i>	Not completed.
Introduction of the agreed road maintenance funding system	CS, LC		There are signals that the opposition from the Ministry of Finance against continuing the trust fund has not abated. LC was partly complied with. In October 2005, the Cabinet approved the establishment of a road maintenance trust fund with revenue collected from a fuel levy. The government requested further World Bank assistance to structure the fund properly. However, the government is unlikely to follow through on the recommendations. (PCR)	Not completed. The existing line of road budget item was simply renamed "RMTF" but no road funding maintenance system was introduced. Note: There is no a legal link between the RMTF and revenue collected from a fuel levy.
<b>11) Strengthening of Land Acquisition and Resettlement</b>				
Appointment of interministerial committee and Social Impact Division in the RDA	CS, LC		LC was complied with. (PCR)	Not completed. The committee was nominated but it is inactive. Further capacity building for the new Environment and Social Division is being provided through TA 4736-SRI. <sup>c</sup> The division was established by TA 4736-SRI.
Introduce standard procedures to remedy LAR problems	CS, LC		The social safeguard compliance manual discusses the measure to minimize resettlement problems (AMR). LC was complied with. (PCR)	Completed.
Propose measures of LAR plan and implementation problems	CS	The consultants proposed remedial measures. (GPCR[R])	<i>No information is available.</i>	Completed.
Implement the approved streamlined procedures	CS		Resettlement action plans for A012, A006 and A001 were completed as sample projects	Completed.
The RDA LAR processes updated following LAA amendment	CS		<i>No information is available.</i>	Not completed. This was done by the RDA's own effort.
<b>12) Others</b>				
Contracting out all routine and periodic maintenance starting 2003	CS, LC		<i>No information is available.</i>	Partially complied with. The RDA retains 5,000 direct labors after closure of the RCDC and the labors handle 100% of routine maintenance and 25% of periodical maintenance.

ADB = Asian Development Bank, AMR = aide-mémoire of the midterm review mission in August 2008, BMS = bridge maintenance system, CS = consulting service, EQ = equipment, GPCR(R) = government project completion report prepared by the Road Development Authority, HDM-4 = Highway Design and Management Model, HIMS = Highway Information Management System, LAA = Land Acquisition Act, LAR = land acquisition and resettlement, LC = loan covenant, NRRTI = National Road Research and Training Institute, PCR = project completion report, PMS = pavement management system, PPER = project or program performance evaluation report, PPPTF = public-private partnership task force, REAP = reengineering action plan, RCDC = Road Construction and Development Company, RDA = Road Development Authority, RMBEC = road maintenance budgeting and expenditure control, RMMS = road maintenance management system, SLRs = Sri Lanka rupees, TA = technical assistance, TOR = terms of reference.

<sup>a</sup> ADB. 2004. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Road Sector Master Plan Project*. Manila (TA 4315-SRI, approved on 20 January).

<sup>b</sup> ADB. 2001. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Road Maintenance Budgeting and Expenditure Control*. Manila (TA 3691-SRI, approved on 27 July).

<sup>c</sup> ADB. 2005. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Capacity Building of the Environmental and Social Division of the Road Development Authority Project*. Manila (TA 4736-SRI, approved on 15 December); attached to ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

Sources: Asian Development Bank databases, aide-mémoire of the midterm review mission in August 2008, government project completion report prepared by the Road Development Authority, and ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI[SF], approved on 18 December).



**Table A3.2: Strengthening Provincial Road Provision (Western, North Western, North Central, and Uva Provinces)**

Targets	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
IDP		The IDP was not found in the PRAs. At completion, the capacity building component has cost \$1.3 million, compared with \$3.8 million at appraisal. (GPCR[M])	The IDP was not found in ADB's project documents.	The IDP was not found at ADB, the MLGPC, and the PRAs. The MLGPC and the PRAs said they referred to the loan agreement as the only document available and relied on consultants to guide them. The MLGPC said that the budget for the capacity development was curtailed due to cost increases in the rehabilitation of provincial roads.
Introduction of information and communication technology tools to carry out the planning and programming functions	CS, EQ	Manuals and management information system for road inventory were prepared. (GPCR[M])	Manuals and management information system were developed. (AMR) Road inventory was completed. (AMR)	Not completed. Road inventory completed through assisting data collection. However, technical problems on updating the information have not been corrected and this database is now outdated and unusable. Under the RSDP, <sup>a</sup> a generic program that targeted all provinces has not necessarily delivered the desired outcomes. Moreover, as the main consultant is based in Colombo at the MLGPC, the consultant had much less direct interaction with the four provincial road agencies, resulting in less effective assistance (para. 40 of RRP of Loan 2546-SRI[SR]). <sup>b</sup>
Introduction of engineering software for detailed design work	CS		<i>No information is available.</i>	Not completed.
Introduction of project management and monitoring software	CS		<i>No information is available.</i>	Not completed.
In 2004, allocating a road maintenance budget of 10% more than in 1999	CS, LC		Complied with. For 2005, the road maintenance budget allocation was increased by 14% for North Central Province, by 33% for Western Province, by 35% for Uva Province, and by 14% for North Western Province, though data cannot be verified. (PCR)	Completed.
Application of a road maintenance financing mechanism by 2005	CS, LC	The asset inventories were created. The PRAs were provided with tools to establish a road maintenance management system, and only the Western PRA was able to use the tool and it resulted in an appropriate budget	Guidelines for preparing road maintenance budget developed. (AMR) LC was not complied with. (PCR)	Not completed. It was confirmed that the LC was not complied with. Because of insufficient funds for maintenance from the central government, there was no point in using the developed road maintenance mechanism.

Targets	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
		allocation for maintenance. Road maintenance and management systems were developed in three of the four provinces. Road maintenance management users' manual was issued to the PRAs. (GPCR[M])		
Introduction of the RMBEC module for financial management	CS, LC		The consultants prepared manuals and guidelines and developed management information systems based on the RMBEC. (PCR)	Partly completed. The RMBEC software was applied in the PRAs but PRAs do not have capability to operate RMBEC. The World Bank has introduced the HDM-4 to the RDA and Uva Province through its National Highways Sector Project <sup>c</sup> and provincial roads project.
Implementation of a PBMC starting in 2005 for 20% of the provincial road network. The contracts will be for a period of 5–7years	CS, LC	Only Western Province implemented the PBMC and the size of the contracts were smaller than intended at appraisal. (GPCR[M])	Not complied with, except in Western Province, which implements the PBMC for all its roads. (PCR)	Completed. Western Province implemented the PBMC for 30% of its provincial roads in 2010.
Contracting out all routine and periodic maintenance starting 2003	CS, LC	Procedure for awarding maintenance contracts to private sector was developed. (GPCR[M])	Partly complied with. All upgrading work is contracted out at present, but some routine and periodic maintenance work is implemented using own labor. (PCR)	Completed. Western Province uses direct labor for maintenance of 20% of its provincial roads in 2010.
Establishment of dedicated road agency by the provincial councils	LC		The LC was complied with. (PCR)	Completed. The road development departments in both Western Province and North Central Province have been transformed to road development authorities. In the other two provinces, they have been changed to road departments.
Actions which were not included in RRP		In Western and North Central provinces, the organizational restructure was approved and was implemented. Planning and budgeting divisions were established and overall management structures are streamlined. Some permanent positions could not be filled. There were 150 training courses	The proposed new structure of RDA provincial offices mirrors the structure of the RDA; and there is still a shortage of qualified staff to fill positions, particularly in the Finance and Administration Division. Management in each PRA was streamlined through a new structure with job descriptions. (PCR)	Confirmed. Western Province said it could strengthen its institutional capability, and the MLGPC asked Western Province to rehabilitate other provinces such as North Western and Sabaragamuwa. On the other hand, the province established a project implementation unit through the RSDP, but the province did not have a chance to use the unit, as it did not have a subsequent project funded by an international financing institute. Uva and North Central provinces are having subsequent projects, and Uva Province, in

Targets	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
		implemented. Improved management policies and procedure were detailed in manuals prepared for PRAs to calculate maintenance budget allocation and to prepare annual works on annual works program. Manuals for management of PRAs and organization structure were papered. (GPCR[M])		particular, is developing capacities further. However, shortage of qualified staff persists in these provinces.

ADB = Asian Development Bank, AMR = aide-mémoire of the midterm review mission in August 2008, CS = consulting service, EQ = equipment, GPCR(M) = government project completion report prepared by the Ministry of Local Government and Provincial Councils, HDM-4 = Highway Design and Management Model, IDP = institutional development program, LC = loan covenant, MLGPC = Ministry of Local Government and Provincial Councils, PBMC = performance-based maintenance contract, PCR = project completion report, PPER = project or program performance evaluation report, PRA = provincial road administration, RDA = Road Development Authority, RMBEC = road maintenance budgeting and expenditure control, RRP = report and recommendation of the President, RSDP = Road Sector Development Project.

<sup>a</sup> ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December).

<sup>b</sup> ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Eastern and North Central Provincial Road Project*. Manila (Loan 2546-SRI [SF], approved on 16 September).

<sup>c</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

Sources: Asian Development Bank databases, aide-mémoire of the midterm review mission in August 2008, government project completion report prepared by the Ministry of Local Government and Provincial Councils, and ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December).

**Table A3.3: Consultancy Service for Detailed Engineering Design of National Highways**

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
Detailed engineering design of 411 km of national highways, including tender documents, resettlement and utility relocation plans, and environmental and social studies	CS	By the end of the initial contract period the consultants had completed only about 10% of the assignment. The [consulting firm] had failed continuously to reach programmed targets in respective time frames. On November 2006, ADB Progress Review Mission; allocated work of the [consulting firm] was curtailed, considering the performance and ability. The following decisions were taken at the above ADB Progress Review Mission due to unavailability of time to select new Consultant Firm to complete the work: (i) allowing Renardet S.A. to complete work which had been commenced; (ii) removing the environmental studies and resettlement studies from the contract; and (iii) handing over part of the topographic survey and detailed design works to the ADB-funded Road Project Preparatory Facility. US\$0.71 million was paid to the consultants against US\$1.20 million of the contract value. (GPCR[R])	The mission noted that consultants' poor performance has resulted in the reduction of scope of the consultancy service. The consultants have failed to keep to new time frames. However, the mission noted that RDA and the consultants have finalized payment and settled all dispute in this regard. (AMR) Because of the unsatisfactory performance of the national highway design consultant, the scope had to be reduced to only 130 km and the remaining scope transferred and completed under another project preparatory TA. (PCR)	No lessons learned, recommendations and follow-up actions were proposed in the PCR. Detailed design for 113 km of road sections was used in the National Highways Sector Project. There were many defects in the design and redesign was required. The remaining work has been transferred to Loan 2080-SRI(SF). <sup>b</sup>

ADB = Asian Development Bank, AMR = aide-mémoire of the midterm review mission in August 2008, CS = consulting service, GPCR(R) = government project completion report prepared by the Road Development Authority, km = kilometer, PCR = project completion report, PPER = project or program performance evaluation report, TA = technical assistance.

<sup>a</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

<sup>b</sup> ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Democratic Socialist Republic of Sri Lanka for the Road Project Preparatory Facility*. Manila (Loan 2080-SRI [SF], approved on 13 April).

Sources: Asian Development Bank databases, aide-mémoire of the midterm review mission in August 2008, government project completion report prepared by the Road Development Authority, and ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December).

**Table A3.4: Technical Assistance**

Target	Input	Achievement		
		Government's Reports and Records	ADB Records	PPER Assessment
TA 4075-SRI(SF). <sup>a</sup>	CS	No information is available.	The PCR rated it <i>unsuccessful</i> . The validation report <sup>b</sup> agreed.	The PPER confirms the rating.

ADB = Asian Development Bank, CS = consulting service, GPCR(R) = government project completion report prepared by the Road Development Authority, PCR = project completion report, PPER = project or program performance evaluation report, TA = technical assistance.

<sup>a</sup> ADB. 2002. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Passenger Transport Services Improvement Project*. Manila (TA 4075-SRI, approved on 19 December); attached to ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December).

<sup>b</sup> ADB. 2010. *Validation Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 13 October).

Sources: Asian Development Bank databases, aide-mémoire of the midterm review mission in August 2008, government project completion report prepared by the Road Development Authority, and ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December).

### STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
The borrower and the Road Development Authority (RDA) shall ensure that for domestically financed consolidated fund civil works contracts over SLRs2.5 million per contract for road construction and maintenance works, which are contracted out to the domestic private sector that.	This was not presented by the project completion report (PCR) as a covenant.	
By end of 2002, the Road Construction and Development Company (RCDC) shall be the prime contractor for private sector subcontractors, including on the job supervision, capacity building, equipment, input supplements and performance guarantees to the RDA		The RCDC no longer exists. In 2010 75% of periodic maintenance was outsourced to the private sector. All routine maintenance are forced accounts. The spirit of the covenant has been complied with.
Engage the 20 best qualified domestic private sector contractors as subcontractors, each subcontractor to be assigned an equal share of work and remunerated on the basis of Highway Schedule of Rates.		Complied with. The project/program performance evaluation report (PPER) confirms the successful implementation of the 20 pilot projects. These projects were catalysts to private sector participation in road building and rehabilitation in Sri Lanka. Some staff members of the RCDC were absorbed by the contractors of the 20 pilot projects. The milestones were no longer relevant. Contracts with the private sectors were negotiated after the completion of the 20 pilot projects.
By the end of 2003, the RDA shall directly contract with the 10 most successful subcontractors, to undertake SLRs1 billion of works using simplified competitive procurement procedures.		Complied with. In 2003, 50 contract packages amounting to SLRs1 billion were awarded to the private sector. In 2004, SLRs2 billion were awarded to the private sector.
Subcontract the remaining SLRs0.5 billion of works through the RCDC to the other ten subcontractors selected.		Complied with.
By the end of 2004, 20 subcontractors to undertake SLRs1.5 billion of works.		Complied with.
Remaining SLRs0.5 billion though the RCDC to ten additional subcontractors.		Complied with.
By the end of 2005, the RCDC's role as prime contractor shall cease, with all private sector contracts thereafter being directly with the RDA, awarded on the basis of competitive bidding.		Partly complied with. While the RCDC was closed in 2004 a new company, the Maga Neguma Group was established including Maga Neguma Road Construction Equipment Company falling under the umbrella group. Maga Neguma however is owned and supervised by the RDA.

Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
The borrower and the RDA shall ensure that domestically financed consolidated fund civil works contracts over SLRs2.5 million per contract for road construction and maintenance works shall be contracted out to the domestic private sector in Sri Lanka		
in the amount of SLRs1.5 billion by the end of 2003.	Complied with. In 2003, SLRs1 billion (100%) contracted out.	Confirmed.
in the amount SLRs2.0 billion by the end of 2004.	Complied with. In 2004, SLRs2 billion (100%) contracted out.	Confirmed.
for no less than 50% of all such contracts by the end of 2006.	Complied with. In 2006, SLRs3 billion (100%) contracted out.	Confirmed.
for no less than 75% of such contracts by the end of 2008.	Complied with. In 2008, SLRs5 billion (100%) contracted out.	Confirmed.
The borrower shall implement a re-engineering action plan (REAP) for development of the private sector under time frames agreed with ADB. Such a REAP shall include;		
development and implementation of options to overcome plant/machinery availability constraints	Partly complied with.	Not complied with. The study was done after the project but not being used.
establishment of an Aggregate Supply Information Unit in RDA to provide information for proposed road works available to prospective bidders	Complied with.	Not completed. The RDA reported this is not done by the project.
Contractor training through Institute for Construction Training and Development; and	Complied with.	Not complied with. The training was carried out but not under the Road Sector Development Project. <sup>a</sup>
support for the RDA and the RCDC staff to establish independent private consulting engineering firms in Sri Lanka.	Complied with. Former RCDC staff absorbed by the private sector	Confirmed. Some staff were absorbed by Maga Neguma and some were absorbed by companies formed as a result of the 20 pilot projects. The spirit of the covenant was complied with.
The borrower and the RDA shall ensure that domestically financed consolidated fund civil works contracts under SLRs2.5 million per contract for road construction and maintenance works shall be consolidated into larger packages so that the annual total expenditure (in nominal terms) of the RDA on contracts under SLRs2.5 million is not increased in 2002–2008 over 2000.	This was not listed by the PCR as a covenant.	
The borrower and the RDA shall implement a REAP for strengthening the RDA planning and programming under the time frames acceptable to ADB. Under such a REAP, the RDA shall, among other things		
develop the capacity of the RDA's	Complied with. Annual data	Partial compliance. The HDM-4 was

Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
Planning Division to identify, formulate and evaluate projects systematically	collection has been established. Pavement and bridge databases have been improved. Economic analysis manual has been issued. Introduced software Highway Design and Management Model (HDM-4) and HDM-4 Information Management System in use.	introduced but was not used until a World Bank project was implemented.
establish formal process of developing multi-year highway development programs	Complied with.	Confirmed.
publish a five year medium term highway development plan by December 2003;	Complied with. The 5-year investment plan of the RDA was issued in 2004. At present, a 5-year rolling highway development program is prepared and updated annually.	Confirmed.
publish a 20-year long term highway development plan by December 2004.	Complied with. The RDA completed a 10-year long-term highway development plan in December 2007.	Confirmed.
The borrower and the RDA shall implement a REAP for strengthening pre-construction processes and construction management under the time frames acceptable to ADB. Under such a REAP, the RDA shall, among other things		
approve revised pre-construction processes, together with associated manuals, technical information, complete training of staff and introduce such processes on a pilot basis, by December 2003	Complied with after initial delays.	Confirmed.
apply revised pre-construction processes to all RDA construction projects by December 2005	Complied with. All volumes of the construction management manual have been approved by the RDA and the Ministry of Highways and are being used.	Confirmed.
prepare and approve improved construction management procedures, including procedures for quality control, scheduling payments, monitoring payments, variations, and dispute resolution by December 2003, and introduce such processes on a pilot basis, by December 2004	Complied with. Applied to Loan 1711-SRI [SF] <sup>c</sup> as case study.	Confirmed.
apply revised construction management procedures to all RDA construction projects by December 2005.	Complied with.	Confirmed.
The borrower and the RDA shall implement a REAP for strengthening road maintenance under time frames acceptable to ADB. Under such a REAP, RDA shall, among other things		
continue to maintain a	Complied with.	Confirmed.

Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
Maintenance Management Unit (MMU) responsible for planning, managing and monitoring maintenance program;		
develop a Pavement Management System (PMS) and staff training for PMS use in planning periodic maintenance through its MMU by December 2003	Complied with. The system was developed in fourth quarter of 2004 and the PMS is being used.	Not complied with. The PMS was not developed
develop a Routine Maintenance Management Systems for estimating the workload, budgeting and monitoring of routine maintenance through its MMU by December 2003	Complied with. The paper on strengthening routine maintenance management was submitted to ADB on 11 March 2005 and applied under Loan 2217-SRI. <sup>d</sup>	Not complied with. Road maintenance budgeting and expenditure control (RMBEC) was not used.
use the PMS to prepare its first Annual Road Maintenance Plan by June 2004 and thereafter prepare annually an Annual Road Maintenance Plan to determine all periodic maintenance	Complied with. The system was developed in fourth quarter of 2004, and a road maintenance plan applied annually	Not complied with. The PMS was not developed
apply the Routine Maintenance Management Systems in 2004.	Complied with. It is applied annually, but the interface between two software packages, the HDM-4 and the RMBEC, needs strengthening	Not complied with. The RMBEC was not used.
The borrower and the RDA shall implement a REAP for road maintenance financing under time frames acceptable to ADB. Under such a REAP, the borrower shall, among other things,		
commence implementation of a streamlined road maintenance budgeting and expenditure control system in 2003;	Complied with. The RDA initiated a process for reviewing and improving road maintenance budgeting and a system for expenditure control with the help of consultants.	Not complied with. The RMBEC was not used.
assess ways of overcoming the shortfall between the required road maintenance financing needs and the amount of the maintenance allocations provided, formulate financing mechanisms to reduce the shortfall, and assess the amount that could be raised under different options in 2003	Complied with.	Partial compliance. The RMBEC was not used.
by June 2004 propose for ADB approval a financing mechanism for sustainable road maintenance funding and establishment of targets agreed with ADB for progressively increasing maintenance budgets to levels required to sustain Sri Lanka's RDA and provincial road assets	Partly complied with. In October 2005, the cabinet approved the establishment of a road maintenance trust fund with revenue collected from a fuel levy. The government requested further World Bank assistance to structure the fund properly. However, the government is unlikely to follow through the recommendations.	Confirmed.
apply the approved mechanism commencing in 2005	Not complied with.	Confirmed.
The borrower and the RDA shall implement a REAP for technical audit under time frames acceptable		



Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
to ADB. Under such a REAP, the RDA shall, among other things,		
establish a technical audit unit with suitable staffing and resources acceptable to ADB by December 2005	Partly complied with. The technical audit unit has been established in the RDA, but the RDA has yet to finalize the functions and the name for the proposed unit or appoint or assign staff	Not completed. The unit was nominally established but not functioning effectively.
develop and test technical audit procedures by December 2005.	Not complied with, as the technical audit unit has not fully been put into operation for reasons given in the cell immediately above.	Not complied with.
The borrower and the RDA shall implement a REAP for land acquisition and resettlement under time frames acceptable to ADB. Under such a REAP, the borrower shall, among other things,		
by June 2003 establish an Inter-Ministerial Committee for improving Land Acquisition and Resettlement chaired by the Secretary, Ministry of Highways and members drawn from Ministry of Home Affairs, Provincial Councils and Local Government, Ministry of Land, Central Environment Authority of Sri Lanka, the RDA, Survey Department, Government Printer, Valuation Department and Attorney General's Department (the Inter-Ministerial Committee);	Complied with. Further capacity building for the new Environment and Social Division is being provided through TA 4736-SRI(SF). <sup>e</sup>	Partial compliance. The Interministerial Committee was established but not active. A Social Safeguard Manual was prepared under TA 4736-SRI(SF). <sup>e</sup>
establish a Social Impact Division within the RDA with resources and responsibilities satisfactory to ADB;	Complied with.	Partial compliance. Environment and Social Division under TA 4736-SRI. <sup>e</sup>
by December 2003 have developed and obtained approval by the Inter-Ministerial Committee of streamlined procedures and strategies for improving land acquisition and resettlement in the road sector in accordance with ADB's Involuntary Resettlement Policy and the borrower's National Involuntary Resettlement Policy;	Complied with.	Not complied with. Interministerial Committee was established but not active. Streamlined procedures developed under Southern Transport Development Project. <sup>c</sup>
by December 2004, have evaluated the implementation of such streamlined procedures.	Complied with. The Environment and Social Division at present implements all safeguard activities of the RDA in line with all major donor guidelines, including those of ADB.	Confirmed.
The borrower shall ensure that for each of the four Project provinces		
by December 2003 the provincial councils shall establish a dedicated road agency with responsibilities, staffing and institutional structures acceptable to the borrower and ADB;	Complied with. All provincial councils have established dedicated road agencies, though Uva delayed it until 2007.	Confirmed.

Covenants <sup>a</sup>	PCR <sup>b</sup>	PPER Comments
such dedicated provincial road administrations (PRAs) shall be operationalized by December 2003 in accordance with agreed institutional improvements and accountability and efficiency criteria agreed between the borrower and ADB	Complied.	Confirmed.
there shall be an allocation of a road maintenance budget of 10% more than in 1999 by December 2004;	Complied with. For 2005 the road maintenance budget allocation was increased by 14% for North Central Province, 33% for Western Province, 35% for Uva Province, and 14% for North Western Province, though data cannot be verified.	Complied with.
all road upgrading and routine and periodic maintenance shall be contracted out by the PRAs commencing in 2004	Partly complied with. All upgrading work is contracted out at present, but some routine and periodic maintenance work is implemented using own labor.	Confirmed.
The PRAs shall implement performance based maintenance contracts for at least 20% of the maintainable road length for which they are responsible by December 2005;	Not complied with, except in Western Province, which implements performance-based maintenance contracts for all its roads	Confirmed.
the approved road maintenance financing mechanisms shall be applied commencing in 2005.	Not complied with	Confirmed.
Submit monthly progress reports		Complied with.
Establish an RDA website supporting the introduction of e-procurement activities.		Complied with.

<sup>a</sup> Based on ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December).

<sup>b</sup> ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December).

<sup>c</sup> ADB. 1999. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Southern Transport Development Project*. Manila (Loan 1711-SRI [SF], approved on 25 November).

<sup>d</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

<sup>e</sup> ADB. 2005. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Capacity Building of the Environmental and Social Division of the Road Development Authority Project*. Manila (TA 4736-SRI, approved on 15 December); attached to ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

Source: Independent Evaluation Department.

## TRAFFIC PERFORMANCE

1. **Background.** This appendix presents the findings of traffic data collection activities carried out by the independent evaluation mission from 15 December 2010 to 23 February 2011. The manual classified counts comprised 12 hours in both directions and were conducted for 2 days. The manual classified count surveys were conducted from 7:00 a.m. to 7:00 p.m. on all 31 roads that had been selected. The traffic count locations were chosen in a manner that would not disrupt local traffic at town centers.

2. **Registered motor vehicles.** The continued expansion of the Sri Lanka economy, which posted an average growth rate of 6.0% for 2005–2009, led to a significant increase in the number of registered vehicles. Table A5.1 shows time series data on historical motor vehicle registration from the Department of Motor Traffic. From 2001, the number of registered motorcycles grew significantly each year, more than 20% on average, reaching a high 27.2% in 2003, when cheap models from the People's Republic of China became more available.

**Table A5.1: Registered Motor Vehicles in Sri Lanka, 2001–2008**

<b>Class of Vehicle</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>AGR (%)</b>
Motor cars	241,444	253,447	274,631	293,747	311,030	338,608	361,211	381,448	6.8
Motor Tricycle	112,239	133,115	169,319	213,108	254,193	318,659	361,727	406,531	20.3
Motorcycles	868,705	923,467	1,010,344	1,134,818	1,265,514	1,422,140	1,604,648	1,760,600	10.6
Buses	66,273	67,702	69,651	71,818	73,887	77,233	79,870	81,050	2.9
Dual Purpose Item									
Vehicles	141,496	150,087	163,355	174,091	180,942	188,187	193,380	196,236	4.8
Lorries	179,451	187,617	198,775	209,478	223,740	244,176	262,584	276,622	6.4
Land Vehicles– Tractors	136,726	143,804	153,808	165,343	180,940	199,980	221,326	245,683	8.8
Land Vehicles– Trailers	32,682	33,128	33,986	35,308	37,134	38,919	41,048	42,823	3.9
<b>Total</b>	<b>1,779,016</b>	<b>1,892,367</b>	<b>2,073,869</b>	<b>2,297,711</b>	<b>2,527,380</b>	<b>2,827,902</b>	<b>3,125,794</b>	<b>3,390,993</b>	<b>9.7</b>

AGR = average growth rate.

Source: Department of Motor Traffic.

3. **Average daily traffic.** A summary of the results from a survey of average daily traffic (average of 2-day, 12-hour counts) for the 10 road projects selected for socioeconomic analysis is given in Table A5.2 and the percentage share of each vehicle type is given in Table A5.3. Motorcycles are the leading vehicle type using the project roads, with a share of over 40% except for Western Province. The share of motorcycles in Western Province is over 30% but the share of three-wheelers at over 25% is higher than in the three other provinces. In terms of share of total vehicles, more passenger cars are traveling along Western Province project roads than in other provinces. It will be noted that Western Province has the highest average per capita monthly household income and the lowest poverty head count ratio among the four provinces covered by the project. The average daily traffic flow (Table A5.3) is also highest in Western Province.

**Table A5.2: Summary of Average Traffic Counts**  
(number)

Vehicle Category	North Central		North Western		Uva		Western			
	NC-1	NC-3	NW-29	NW-40	UV-71	UV-77	WP-116	WP-121	WP-141	WP-170
Motorcycle	818	792	1077	612	421	416	3,019	1,165	1,333	2,277
Three-wheeler	239	280	384	475	350	81	2,086	538	1,861	1,763
Car/saloon	70	80	35	45	45	13	549	120	232	853
Utility (van/jeep/ pickup)	157	167	150	113	80	61	696	310	364	953
Light truck	55	30	66	41	11	21	182	68	85	117
Medium truck	32	41	64	41	22	15	211	83	106	114
Heavy truck	87	69	109	93	37	12	239	379	131	339
Multi-axle	0	1	3	1	1	0	3	16	2	8
Minibus	19	10	50	23	7	0	44	37	15	19
Large bus	44	25	30	0	6	13	97	8	8	179
Service vehicle	4	6	1	0	2	0	7	7	2	2
Tractor	10	10	19	30	0	10	20	5	26	13
Bicycle	232	174	270	234	28	242	223	261	1261	271
Cart	0	0	1	0	0	0	0	0	10	5
Total MT	1,535	1,509	1,985	1,471	979	640	7151	2,736	4,161	6,632
Total (12 hrs)	1,767	1,683	2,255	1,705	1,007	882	7,374	2,997	5,432	6,907
<b>ADT</b>	<b>2,474</b>	<b>2,356</b>	<b>3,157</b>	<b>2,387</b>	<b>1,410</b>	<b>1,235</b>	<b>10,324</b>	<b>4,196</b>	<b>7,605</b>	<b>9,670</b>

ADT = average day traffic, hr = hour, NC = North Central Province, MT = motorized traffic, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

**Table A5.3: Traffic Share Based on Average Traffic Counts by Vehicle Type**  
(%)

Vehicle Category	North Central		North Western		Uva		Western			
	NC-1	NC-3	NW-29	NW-40	UV-71	UV-77	WP-116	WP-121	WP-141	WP-170
Motorcycle	46.3	47.0	47.7	35.8	41.7	47.1	40.9	38.9	24.5	32.9
Three-wheeler	13.5	16.6	17.0	27.8	34.6	9.2	28.3	18.0	34.2	25.5
Bicycle	13.1	10.3	12.0	13.7	2.8	27.4	3.0	8.7	23.2	3.9
Utility (van/jeep/ pickup)	8.9	9.9	6.6	6.6	7.9	6.9	9.4	10.3	6.7	13.8
Heavy truck	4.9	4.7	4.8	5.4	3.7	1.4	3.2	12.6	2.4	4.9
Car/saloon	4.0	4.1	1.5	2.6	4.4	1.5	7.4	4.0	4.3	12.3
Light truck	3.1	1.8	2.9	2.4	1.1	2.4	2.5	2.3	1.6	1.7
Large bus	2.5	1.5	1.3	0.0	0.6	1.5	1.3	0.3	0.1	2.6
Medium truck	1.8	2.4	2.8	2.4	2.2	1.7	2.9	2.8	1.9	1.6
Minibus	1.1	0.6	2.2	1.3	0.7	0.0	0.6	1.2	0.3	0.3
Tractor	0.6	0.6	0.8	1.8	0.0	1.1	0.3	0.2	0.5	0.2
Service vehicle	0.2	0.4	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.0
Multi-axle	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.0	0.1
Cart	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

**Table A5.4: Average traffic flows for the four provinces**  
(number)

Vehicle Category	NC	NW	UV	WP
Motorcycle	910	755	489	1,385
Three-wheeler	290	245	229	933
Car/saloon	46	39	22	284
Utility (van/jeep/pickup)	117	101	72	377
Light truck	43	39	17	73
Medium truck	29	39	17	109
Heavy truck	69	81	25	190
Multi-axle	0	1	0	5
Minibus	11	21	7	25
Large bus	26	13	21	33
Service vehicle	3	1	2	3
Tractor	14	20	8	23
Bicycle	317	222	131	420
Cart	0	0	0	2
Total (12 hrs)	1,876	1,578	1,040	3,862
<b>ADT</b>	<b>2,626</b>	<b>2,209</b>	<b>1,456</b>	<b>5,407</b>

ADT = average day traffic, hr = hour, NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

4. **Comparison of 2000, 2007, and 2011 traffic.** Table A5.5 compares the traffic flows in 2000, 2007, and 2011. In the five road sections traffic declined. One road section is in North Western Province, one in Uva Province, and three are in Western Province. Traffic on WP-134 declined on average by 4.3% annually. The closure of a major ceramics factory near the end of WP-134 may have caused this. Traffic on WP-177 declined slightly (1.7%). This is a narrow road and other roads in this area have also been rehabilitated. Traffic may have been diverted to the better and wider roads. However, heavy bicycle traffic was observed on WP-177. Traffic along UV-71 (Mailagastenna–Thoranakapolla–Kottagoda) declined by 5.4% per annum. Two other provincial roads start midway on UV-71, one of which is UV-72 (Welikemulla–Medagama–Wevelhinna). As the first section of UV-71 carries traffic for the other two roads, the 2011 traffic flow count was conducted beyond the intersection of UV-72. It is possible that the previous counts may have been done in the overlapping section closer to Badulla town. NW-48 showed almost no growth in traffic. There is no significant difference between 2007 and 2011 traffic. Only part of the road has been rehabilitated and one segment is in very bad condition, hence fewer vehicles use the road from that end. There has been a significant reduction in car and tractor traffic. Three-wheeler traffic has increased.

**Table A5.5: Comparison of Traffic Flows, 2000–2011**

Province	Road Section Number and Name in PCR	12-hour Traffic Flow			Annual Average Growth Rate (%)
		2000	2007	2011	
NC	1 Anuradhapura–Arippu		1154	2468	20.9
NC	3 Kothalawala	1198		2347	7.0
NC	5 Medirigiriya–Chaittya		2576	4442	14.6
NC	17 Alisthana–Thuruwila	1491	632	1233	2.4
NW	27 Thalawa–Siyambalangamuwa	420	1920	907	5.9
NW	29 Melsiripura–Rambe	589	3980	3156	15.9
NW	32 Hendiyapola–Deduruoya	947	1824	3366	14.0
NW	38 Diulwewa–Galadenigama	1225	2483	1665	1.5
NW	40 Bathalagoda–Pangolla		1600	2387	10.5
NW	48 Ganewatta–Nagollagama		1745	1732	(0.2)
NW	50 Badagamuwa–Wellawa	918	859	2244	13.0

Province	Road Section Number and Name in PCR	12-hour Traffic Flow			Annual Average Growth Rate (%)
		2000	2007	2011	
UV	71 Mailagastenna–Thoranakapolla–Kottagoda	2230	2212	1406	(5.4)
UV	72 Welikemulla–Medagama–Wevelhinna	400	1274	1251	10.4
UV	74 Dambagalla–Mariatara	682	1711	2262	11.9
UV	76 Balaharuwa–Hambegamuwa	1039	888	1116	1.6
UV	77 Kudaoya–Balaharuwa	658	1758	1234	4.7
WP	116 Homagama–Talagala	5049	18874	10315	5.3
WP	117 Oruwela–Mullegama	1618		4555	10.9
WP	119 Meegoda–Gehenuwala–Artigala	2198	4162	2859	1.1
WP	121 Malwana–Samanabedde	1706		4186	9.4
WP	122 Nawagmuwa–Koratota	2466		3765	4.3
WP	134 Thumbowila–Wewala	4276	4356	2997	(4.3)
WP	137 Kerawalapitiya–Mahabage	4352		7002	4.9
WP	141 Palliyawatte–Dikkowita	3234		7603	8.9
WP	149 Pelanwatta–Kosgahahena	1748		7155	15.1
WP	150 Munagama–Millewa	974	4265	7919	22.3
WP	151 Raigama–Anguruwatota	1167	7888	4890	13.1
WP	158 Nawinna–Rajamahawihara	1745		2407	3.3
WP	167 Ambalammulla–Katunayake	1541		1506	-0.2
WP	170 Hokandara–Kottawa	3170		9668	11.8
WP	177 Thotawathta–Ambalanduwa	4554	5742	4217	(1.7)

( ) = negative, NC = North Central Province, NW = North Western Province, PCR = project completion report, UV = Uva Province, WP = Western Province.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); ADB. 1997. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Second Provincial Roads Improvement*. Manila (TA 2904-SRI, approved on 30 October); Cardno MBK. 2008. *Road Sector Development Project Provincial Road Component: Economic Reevaluation*. Colombo; and independent evaluation mission's rapid survey team.

5. **Distribution of vehicle types.** Table A5.6 shows the vehicle type distribution of total registered motor vehicles in Sri Lanka, and Table A5.7 gives the vehicle type distribution of new registrations. Motorcycles dominate the total registered vehicles and new vehicle registration in Sri Lanka. Three-wheelers come in second. Percentage shares of all other vehicles have been declining in favor of motorcycles and three-wheelers. The percentage of buses is low compared with other vehicles. Hardly any new buses have been registered (Table A5.7) and new vehicles are also dominated by motorcycles and three-wheelers.

**Table A5.6: Distribution of Total Vehicle Registrations**  
(%)

Vehicle Category	2001	2002	2003	2004	2005	2006	2007	2008
Motorcycle	49	49	49	49	50	50	51	52
Three-wheeler	6	7	8	9	10	11	12	12
Car/saloon	14	14	13	13	12	12	12	11
Utility (van/jeep/pickup)	8	8	8	8	7	7	6	6
Truck	10	10	10	9	9	9	9	8
Bus	4	4	3	3	3	3	3	2
Tractor	8	8	8	7	7	7	7	7

Sources: Department of Motor Traffic Sri Lanka, and independent evaluation mission's rapid survey team.

**Table A5.7: Distribution of New Vehicle Registrations**  
(%)

Vehicle Category	2001	2002	2003	2004	2005	2006	2007	2008
Motorcycle	47	49	48	56	57	52	62	59
Three-wheeler	14	18	20	20	18	22	15	17
Car/saloon	12	11	12	9	8	9	8	8
Utility (van/jeep/pickup)	8	8	7	5	3	2	2	1
Truck	8	7	6	5	6	7	6	5
Bus	2	1	1	1	1	1	1	0
Tractor	8	6	6	5	7	6	7	9

Source: Independent evaluation mission's rapid survey team.

6. Table A5.8 shows the percentage distribution of vehicle types on sample roads in the four provinces. Except for Western Province, which has the highest income among the four provinces, the percentage of passenger cars on the project roads is significantly lower than the nationwide share of passenger cars. The percentage share of motorcycles in Western Province is also significantly lower than the nationwide share.

**Table A5.8: Percentage Distribution of Vehicle Types on Sample Roads to Total Motorized Vehicles and to Total Vehicles**  
(%)

Vehicle Category	NC		NW		UV		WP	
	MT	Total	MT	Total	MT	Total	MT	Total
Motorcycle	58	49	56	48	54	47	40	36
Three-wheeler	19	16	18	16	25	22	27	24
Car/saloon	3	2	3	2	2	2	8	7
Utility (van/jeep/pickup)	8	6	7	6	8	7	11	10
Truck	9	8	1	10	7	6	11	10
Bus	2	2	3	2	3	3	2	1
Tractor	1	1	1	1	1	1	1	1

MT = motorized traffic, NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Sources: Department of Motor Traffic Sri Lanka, and independent evaluation mission's rapid survey team.

7. **Vehicle growth rates.** Table A5.9 shows the vehicle growth rates given in the Road Project Preparatory Facility<sup>1</sup> consultants' estimate for the period 2007–2011; the growth rates calculated were based on the Department of Motor Traffic statistics. There is a significant difference between the estimates from the Road Project Preparatory Facility and the actual growth, particularly for motorcycles and three-wheelers. Vehicle growth rates based on the traffic counts were significantly different from any of the two estimates.

<sup>1</sup> ADB. 2004. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Democratic Socialist Republic of Sri Lanka for the Road Project Preparatory Facility*. Manila (Loan 2080-SRI[SF], approved on 13 April).

**Table A5.9: Vehicle Growth Rates**

Vehicle Category	Growth Rates (%)	
	RPPF Estimate	Based on Vehicle Registration Statistics
Motorcycle	8.7	10.6
Three-wheeler	6.1	20.2
Car/saloon	8.5	6.8
Utility (van/jeep/pickup)	7.4	4.8
Truck	6.3	6.9
Bus	2.3	2.9
Tractor	3.1	3.9

RPPF = Road Project Preparatory Facility.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December); and independent evaluation mission's rapid survey team.

8. Growth rates that were calculated based on traffic counts for the 10 road projects selected for the socioeconomic analysis are given in Table A5.10. The motorcycle, three-wheeler, and car/saloon categories show positive growth even though the growth rates vary widely from road to road. Growth rates for utility vehicles and all types of goods vehicles are also positive. There is a clear reduction in the growth of tractors and bicycles.

**Table A5.10: Traffic Growth Rates Based on 2011 Traffic Counts (%)**

Vehicle Category	North Central		North Western		Uva		Western			
	NC-1	NC-3	NW-29	NW-40	UV-71	UV-77	WP-116	WP-121	WP-141	WP-170
Motorcycle	9.2	9.1	24.4	6.2	1.4	18.7	10.3	10.4	14.2	13.7
Three-wheeler	24.0	9.8	41.4	35.4	1.3	14.5	15.0	12.3	13.7	15.3
Car/saloon	67.0	1.3	5.1	14.7	1.6	15.8	16.0	18.5	6.0	25.8
Utility (van/jeep/pickup)	30.0	9.2	15.3	9.6	(9.2)	3.7	0.1	9.2	1.0	9.3
Minibus	20.5	(7.2)	47.9	7.8	(19.2)	(99.0)	(10.4)	5.3	(7.0)	(11.5)
Large bus	13.0	2.1	45.3	(100)	3.2	(1.8)	9.5	1.3	(0.6)	13.8
Light goods vehicle	17.3	14.7	11.7	11.9	(5.3)	5.9	5.0	4.3	10.2	7.2
Medium goods vehicle	23.8	21.2	39.1	37.3	2.1	5.1	(0.3)	87.3	11.8	16.3
Heavy goods vehicle	0.0	0.0	13.3	0.0	(3.5)	0.0	15.4	36.5	10.8	26.5
Tractor/trailer	(34.7)	(4.6)	(1.5)	(4.2)	(99.0)	(9.1)	(2.2)	(12.5)	(1.6)	12.1

( ) = negative, NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

9. **Travel times before and after the project.** As there were no records of travel times before the project, sample travel time surveys were done on similar but not rehabilitated roads along with the travel time surveys on selected project roads. The summary of the travel time surveys is in Table A5.11. As the conditions are similar for North Central and North Western provinces, travel time surveys were conducted only in North Central Province.



**Table A5.11: Summary of Travel Time**

<b>Province</b>	<b>Time Taken</b>	<b>Distance (km)</b>	<b>Travel Time per km</b>	<b>Travel Time Saving per km</b>
<b>NC/NW</b>				
Rehabilitated (Arippu)	0:05:20	5	0:01:04	
Macadam	0:05:06	2	0:02:33	0:01:29
<b>UV</b>				
Rehabilitated (Kudaoya)	0:05:35	5	0:01:07	
Macadam	0:04:55	2	0:02:28	0:01:21
<b>WP</b>				
Rehabilitated (Homagama)	0:05:30	5	0:01:06	
Macadam	0:05:00	2	0:02:30	0:01:24

km = kilometer, NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

## REEVALUATION OF THE ECONOMIC INTERNAL RATES OF RETURN

1. The economic analysis is based on a comparison of with-project and without-project situations. The basic methodology follows the Guidelines for the Economic Analysis of Projects of the Asian Development Bank.<sup>1</sup> The 31 selected road projects were evaluated using a benefits period of 20 years, which is the assumption used in the economic analysis at appraisal. All benefits and costs are in constant 2010 prices.

2. The approach used to reevaluate the subprojects is similar to that used at appraisal and project completion. The same assumptions on traffic growth, unit cost value of the vehicle operating cost (VOC,) value of time, recurring maintenance cost,<sup>2</sup> and a 12% economic internal rate of return (EIRR) threshold were used, with necessary updates. The EIRR was recalculated for all 31 road projects selected.

3. **Estimation of capital and maintenance costs.** Economic costs were converted from financial costs by applying a standard conversion factor of 0.91 for nontradable goods. The economic costs comprise capital costs and maintenance costs. The base-case costs exclude the cost of variations and additional works done. Actual capital costs comprise civil work costs of road improvement and associated environmental monitoring, construction supervision and land acquisition, unexploded ordnance clearance, and project management costs. The capital cost was calculated by adjusting the data obtained from the report and recommendation of the President (RRP) and the project completion report (PCR) to 2010 values using manufacturing unit value index<sup>3</sup> and the consumer price index.<sup>4</sup> Details about the 31 selected roads and the capital costs used for the economic analysis are given in Table A6.1.

**Table A6.1: Capital Costs and Road Length**

Province	Road Section Number and Name in PCR	Length (km)	Capital Cost (Rs millions)	
			Road	Bridge
NC	1 Anuradhapura–Arippu	18.59	196.38	
	3 Kothalawala	5.42	51.20	17.98
	5 Medirigiriya–Chaittya	3.5	33.06	8.99
	17 Alisthana–Thuruwila	13.4	81.64	
NW	27 Thalawa–Siyambalangamuwa	3.22	32.87	
	29 Melsiripura–Rambe	30.65	338.08	
	32 Hendiyapola–Deduruoya	11.83	133.58	5.20
	38 Diulwewa–Galadenigama	9	102.50	5.08
	40 Bathalagoda–Pangolla	3.86	46.89	
	48 Ganewatta–Nagollagama	9.9	114.22	
UV	50 Badagamuwa–Wellawa	11.88	153.92	
	71 Mailagastenna–Thoranakapolla–Kottagoda	7.41	110.06	12.16
	72 Welikemulla–Medagama–Wevelhinna	6.71	99.66	24.32
	74 Dambagalla–Mariarawa	12.72	183.35	
	76 Balaharuwa–Hambegamuwa	7.64	70.27	
77 Kudaoya–Balaharuwa	12.85	118.19		

<sup>1</sup> ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila.

<sup>2</sup> Maintenance costs comprising routine and periodic maintenance costs were assumed to start in the first year after completion of the construction works. The maintenance costs are assumed at Rs41 per square meter (m<sup>2</sup>) for grading, Rs380/m<sup>2</sup> for pothole patching, and Rs61/ m<sup>2</sup> for crack sealing, based on the current field information.

<sup>3</sup> <http://externalization.worldbank.org/external/default/main?theSitePK=2880771&piPK=64691875&pagePK=64691887&menuPK=2881070&contentMDK=21204438>

<sup>4</sup> Department of Census and Statistics Sri Lanka and Central Bank of Sri Lanka.

Province	Road Section Number and Name in PCR	Length (km)	Capital Cost (Rs millions)		
			Road	Bridge	
WP	116	Homagama–Talagala	7.55	107.96	22.95
	117	Oruwela–Mullegama	0.27	3.36	10.00
	119	Meegoda–Gehenuwala–Artigala	7.98	199.17	
	121	Malwana–Samanabedde	14.34	222.38	
	122	Nawagmuwa–Koratota	3.68	57.07	
	134	Thumbowila–Wewala	1.49	17.81	
	137	Kerawalapitiya–Mahabage	4.03	60.23	20.58
	141	Palliyawatte–Dikkowita	2.22	35.80	
	149	Pelanwatta–Kosgahahena	3.01	56.23	
	150	Munagama–Millewa	7.22	108.40	9.75
	151	Raigama–Anguruwatota	3.22	48.35	4.88
	158	Nawinna–Rajamahawihara	1.12	24.74	
	167	Ambalammulla–Katunayake	5.1	54.18	
	170	Hokandara–Kottawa	3.9	41.43	
	177	Thotawaththa–Ambalanduwa	2.29	43.56	

km = kilometer, NC = North Central Province, NW = North Western Province, PCR = project completion report, UV = Uva Province, WP = Western Province.

Source: ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December).

4. The roughness values used to measure benefits and to determine timing of maintenance interventions are shown in Table A6.2. Roughness measurements were taken on the 31 road sections in January 2011. Investments in periodic maintenance were assumed as the roads reached an international roughness index (IRI) of 7. An average IRI of 9 is assumed in the without-project scenario, as there is no IRI measurement available. The assumption in the RRP and PCR is that the IRI equals 2, implying that the road condition will be kept at the same roughness with new pavement. The IRIs of most road sections were more than 3 as of January 2011, and the weighted average of IRI is about 3.3 for the 31 road sections. After completion of the Road Sector Development Project (RSDP)<sup>5</sup> the pavement started deteriorating. The increase in the IRI affects the VOC and the EIRR.

**Table A6.2: Measured roughness values**  
(reasonable minimum average value)

Province	Road Section Number and Name in PCR	IRI Measured
NC	1 Anuradhapura–Arippu	3.01
	3 Kothalawala	3.59
	5 Medirigiriya–Chaittya	3.74
	17 Alisthana–Thuruwila	3.47
NW	27 Thalawa–Siyambalangamuwa	4.02
	29 Melsiripura–Rambe	3.08
	32 Hendiyapola–Deduruoya	4.32
	38 Diulwewa–Galadenigama	3.75
	40 Bathalagoda–Pangolla	3.30
	48 Ganewatta–Nagollagama	3.33
	50 Badagamuwa–Wellawa	3.30
UV	71 Mailagastenna–Thoranakapolla–Kottagoda	3.48
	72 Welikemulla–Medagama–Wevelhinna	3.00
	74 Dambagalla–Mariarawa	3.66
	76 Balaharuwa–Hambegamuwa	3.46

<sup>5</sup> ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December).

Province	Road Section Number and Name in PCR	IRI Measured
	77 Kudaoya–Balaharuwa	3.05
WP	116 Homagama–Talagala	2.66
	117 Oruwela–Mullegama	4.90
	119 Meegoda–Gehenuwala–Artigala	3.37
	121 Malwana–Samanabedde	2.44
	122 Nawagmuwa–Koratota	3.39
	134 Thumbowila–Wewala	2.95
	137 Kerawalapitiya–Mahabage	4.50
	141 Palliyawatte–Dikkowita	3.10
	149 Pelanwatta–Kosgahahena	4.17
	150 Munagama–Millewa	3.00
	151 Raigama–Anguruwatota	3.00
	158 Nawinna–Rajamahawihara	3.00
	167 Ambalammulla–Katunayake	3.10
	170 Hokandara–Kottawa	3.04
177 Thotawathta–Ambalanduwa	3.20	

IRI = international roughness index, NC = North Central Province, NW = North Western Province, PCR = project completion report, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

5. **Estimation of benefits.** Direct benefits quantified by the reevaluation comprised the VOC savings and travel time savings. For all roads, the VOC savings are taken from normal and generated traffic. Table A6.3 shows sample unit cost values used to estimate the VOC.

**Table A6.3: Unit Cost Values Used for Vehicle Operating Cost Calculation (SLRs)**

Name	Purchase Cost	Replace- ment Tire	Fuel (per liter)	Lubricant (per liter)	Maintenance Labor (per hour)	Crew Wages (per hour)
<b>A. Motorized Vehicle Types</b>						
Motorcycle	150,000	2000	75.00	250	53	68
Three-wheeler	150,000	2000	75.00	250	53	68
Car	1,500,000	4500	72.00	250	107	152
Van/pickup	1,700,000	5000	58.00	250	122	137
Minibus	1,900,000	7500	58.00	250	137	137
Bus	3,000,000	25000	58.00	250	152	198
Light Truck	1,700,000	6000	58.00	250	122	137
Medium Truck	2,400,000	20000	58.00	250	137	228
Heavy Truck	4,800,000	50000	58.00	250	137	228
<b>B. Non-Motorized Vehicle Types</b>						
Foot cycle	6,000					
Cart	18,000					

VOC = vehicle operating cost.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); ADB. 2009. *Completion Report: Road Sector Development Project in Sri Lanka*. Manila (Loan 1986-SRI [SF], approved on 18 December); and independent evaluation mission's rapid survey team.

6. **Results of the economic reevaluation.** The EIRR recalculations for each road project were based on actual traffic growth up to 2010 and assumed growth rates thereafter. The

results are presented in Table A6.4 along with the calculated EIRR at appraisal and reevaluation done in 2007 (RSDP reevaluation report, February 2008).<sup>6</sup>

**Table A6.4: Comparison of Economic Internal Rates of Return**

Province	Road Section Number and Name in PCR	EIRR		
		Appraisal	Reevaluation in 2008 <sup>a</sup>	PPER
NC	1 Anuradhapura–Arippu	42.0		21.5
	3 Kothalawala	36.2	25.8	20.2
	5 Medirigiriya–Chaittya	85.2	60.9	23.3
	17 Alisthana–Thuruwila	29.0		20.0
NW	27 Thalawa–Siyambalangamuwa	20.5	36.4	7.7
	29 Melsiripura–Rambe	25.9	35.3	25.6
	32 Hendiyapola–Deduruoya	54.7	51.8	26.7
	38 Diulwewa–Galadenigama	37.3	24.7	20.3
	40 Bathalagoda–Pangolla	19.9		20.1
	48 Ganewatta–Nagollagama	25.5	23.4	20.8
	50 Badagamuwa–Wellawa	33.3	10.2	20.4
UV	71 Mailagastenna–Thoranakapolla–Kottagoda	45.1		17.3
	72 Welikemulla–Medagama–Wevelhinna	15.8	11.8	11.2
	74 Dambagalla–Mariarawa	19.0	51.7	20.5
	76 Balaharuwa–Hambegamuwa	34.4		18.1
	77 Kudaoya–Balaharuwa	22.4		20.1
WP	116 Homagama–Talagala	127.5		55.6
	117 Oruwela–Mullegama	29.5		10.0
	119 Meegoda–Gehenuwala–Artigala	37.1	19.5	20.1
	121 Malwana–Samanabedde	44.8		28.5
	122 Nawagmuwa–Koratota	59.0		27.9
	134 Thumbowila–Wewala	78.1	61.0	30.8
	137 Kerawalapitiya–Mahabage	75.1		40.2
	141 Palliyawatte–Dikkowita	59.7		33.6
	149 Pelanwatta–Kosgahahena	45.7		32.3
	150 Munagama–Millewa	28.0	28.5	45.2
	151 Raigama–Anguruwatota	30.6		28.8
	158 Nawinna–Rajamahawihara	59.2		18.2
	167 Ambalammulla–Katunayake	26.0		12.2
170 Hokandara–Kottawa	78.0		70.6	
177 Thotawathta–Ambalanduwa	91.2		14.1	

EIRR = economic internal rate of return, NC = North Central Province, NW = North Western Province, PCR = project completion report, UV = Uva Province, WP = Western Province.

<sup>a</sup> Cardno MBK. 2008. *Road Sector Development Project Provincial Road Component: Economic Reevaluation*. Colombo (ADB Loan 1986-SRI).

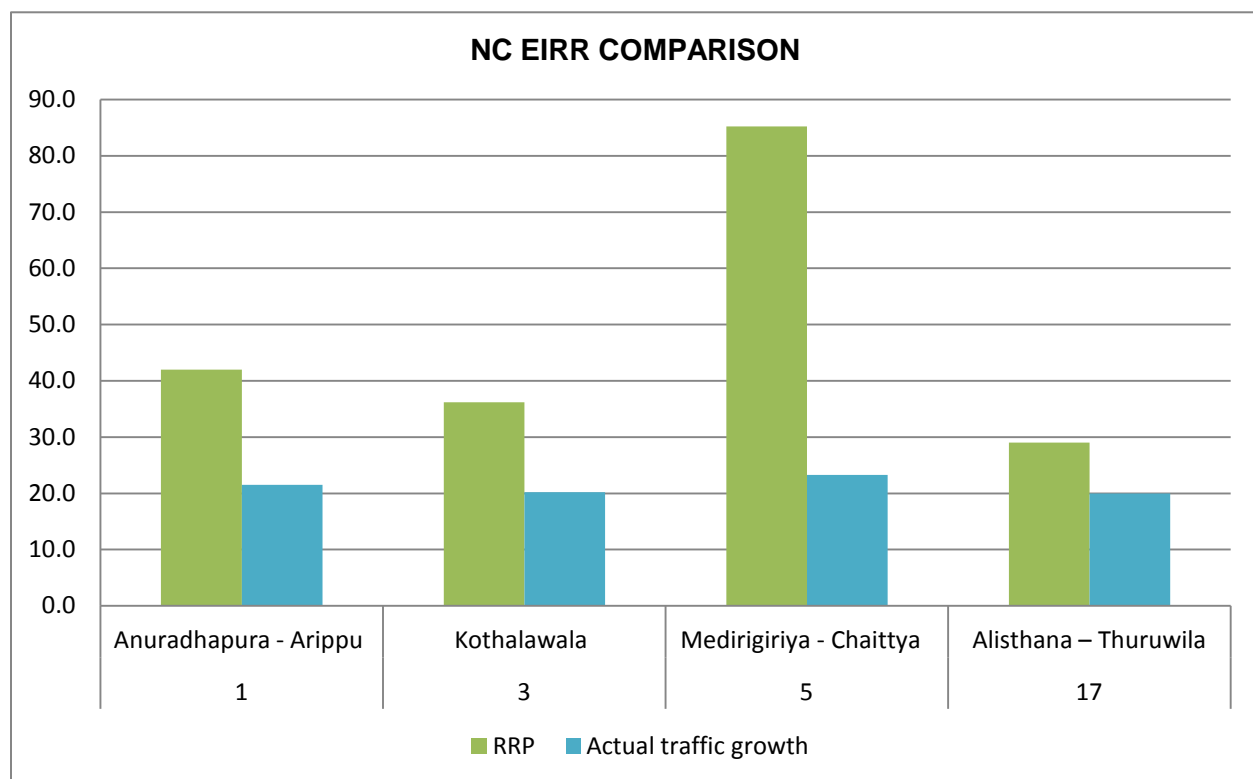
Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); Cardno MBK. 2008. *Road Sector Development Project Provincial Road Component: Economic Reevaluation*. Colombo (ADB Loan 1986-SRI); independent evaluation mission; and independent evaluation mission's rapid survey team.

<sup>6</sup> Cardno MBK. 2008. *Road Sector Development Project Provincial Road Component: Economic Reevaluation*. Colombo (ADB Loan 1986-SRI).

7. Using the same assumptions as the RRP, the EIRRs recalculated for the project performance evaluation report (PPER) for 28 road sections were above the 12% threshold. In three cases the EIRRs were lower than 12%. The following sections further discuss the results for each province. The total recalculated EIRR for all 31 project roads is 27.8%. The EIRRs of most road sections are much lower than the estimates at appraisal. The economic evaluation of the RRP was over-estimated. One of the reasons for the over-estimate is that the hypothetical traffic volume was used as the base-year data instead of actual traffic counting.

8. **North Central Province.** Figure A6.1 gives a comparison of the EIRR estimates. EIRR values based on 2010 costs and recent traffic are higher than 12% for all roads but less than the RRP estimates.

**Figure A6.1: Comparison of Economic Internal Rates of Return for North Central Province**



EIRR = economic internal rate of return, NC = North Central Province, RRP = report and recommendation of the President.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); and independent evaluation mission's rapid survey team.

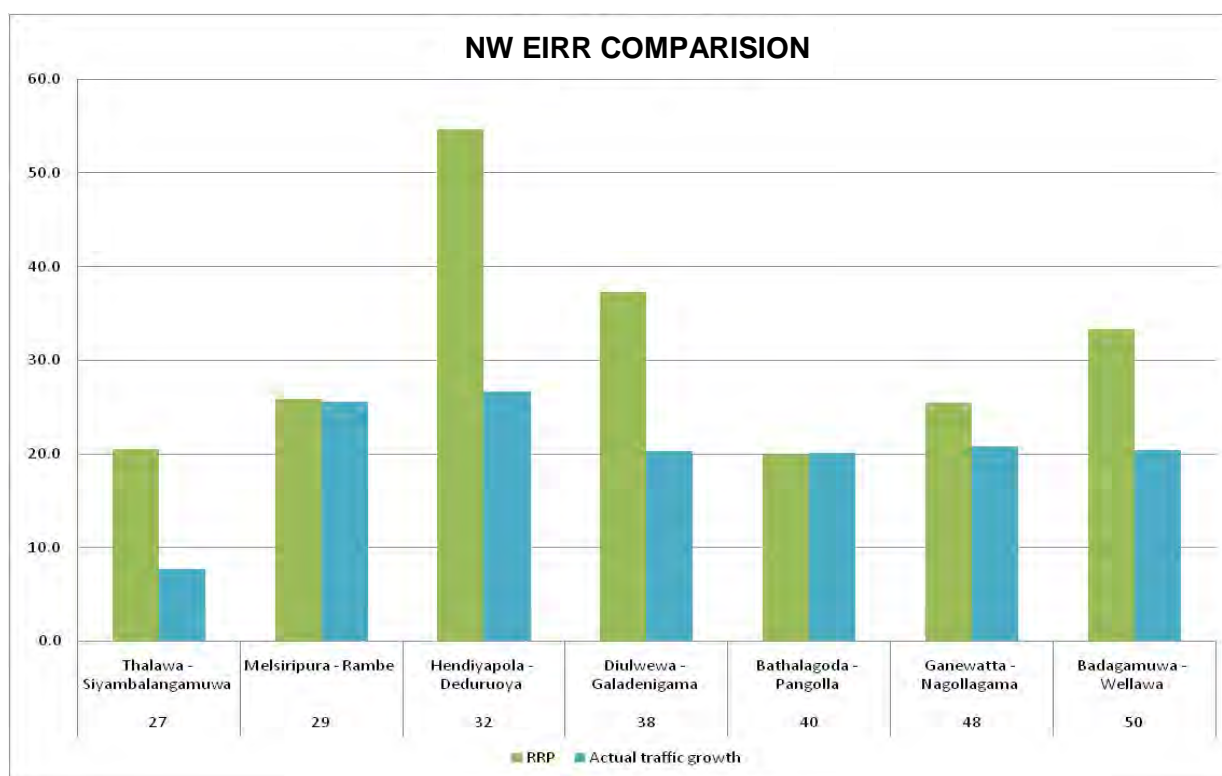
9. NC-1 Anuradhapura–Arippu continues beyond the rehabilitated section to serve a number of small towns. It also serves as the access road to a famous, archeologically significant pilgrimage site, Thanthirimale. However, visitor traffic is seasonal, especially in the month of July and during weekends and full moon (Poya) days. This traffic has not been captured in the current analysis. Road construction work was in progress on a road that connects to NC-1 Anuradhapura–Arippu. Hence, a significantly higher percentage of trucks was counted.

10. NC-3 Kothalawala serves as a shorter route between Hingurakkoda and Polonnaruwa (district capital) and there has been a significant increase in heavy vehicles compared with others routes. Because of the higher volume of heavy vehicles, the road has started to deteriorate prematurely. The higher IRI value (3.59 or higher) supports this observation. Hence, the VOC savings estimated in the Highway Design and Management Model (HDM-4) analysis have been reduced and costs have been allocated to maintenance and improvements.

11. A significant rise in traffic was observed after the rehabilitation of NC-5 Medirigiriya–Chaittya. This road also gives access to a pilgrimage site that attracts seasonal traffic and has started showing distress due to higher vehicle traffic (IRI of 3.74 and higher). The recent traffic count has captured more light vehicles but not buses and minibuses that carry pilgrims. Here, the bridge cost was included in the capital cost. Because of higher costs, a higher IRI, and fewer buses captured in the traffic surveys, an EIRR below the RRP estimate was generated.

12. **North Western Province.** Figure A6.2 gives a comparison of the EIRR estimates for the North Western Province. All except one project road show EIRRs above the 12% threshold.

**Figure A6.2: Comparison of Economic Internal Rates of Return for North Western Province**



EIRR = economic internal rate of return, NW = North Western Province, RRP = report and recommendation of the President.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); and independent evaluation mission's rapid survey team.

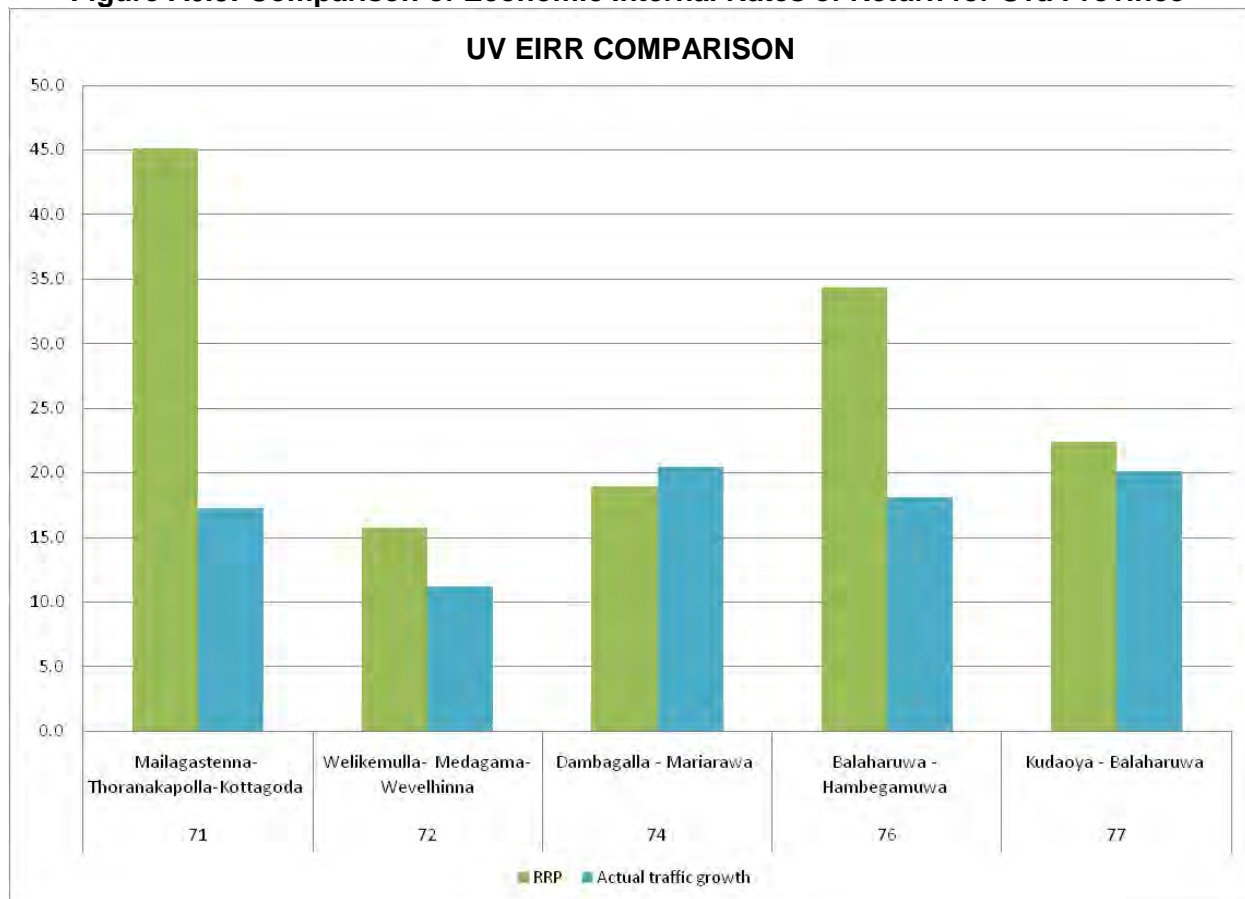
13. Traffic flow of 1,000 vehicles per day observed on NW-27 Thalawa–Siyambalagamuwa is lower than that of the other six roads in the province. Significantly fewer trucks and buses are using the road than in 2007 traffic counts. This road leads to an irrigation tank and there is no through traffic. Road roughness is also high compared with other roads (IRI = 4.02 or higher).

14. The recalculated EIRR for NW-40 Bathalagoda–Pangolla is slightly higher than the RRP estimate and that for NW-29 Malsiripura–Rambe is very close to the RRP estimate. Increases in traffic for all vehicle types were observed on both roads. NW-29 Malsiripura–Rambe connects A-006 Ambepuss–Trincomalee with the Mahawa–Madagalla road. Conditions of both roads are also good (IRI around 3.1–3.3). NW-29 Malsiripura–Rambe is wider than NW-40 Bathalagoda–Pangolla.

15. The overall EIRR for the seven roads in North Western Province is 23.14%.

16. **Uva Province.** Figure A6.3 gives a comparison of the EIRR estimates for the project roads in Uva Province rehabilitated.

**Figure A6.3: Comparison of Economic Internal Rates of Return for Uva Province**



EIRR = economic internal rate of return, RRP = report and recommendation of the President, UV = Uva Province.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); and independent evaluation mission's rapid survey team.

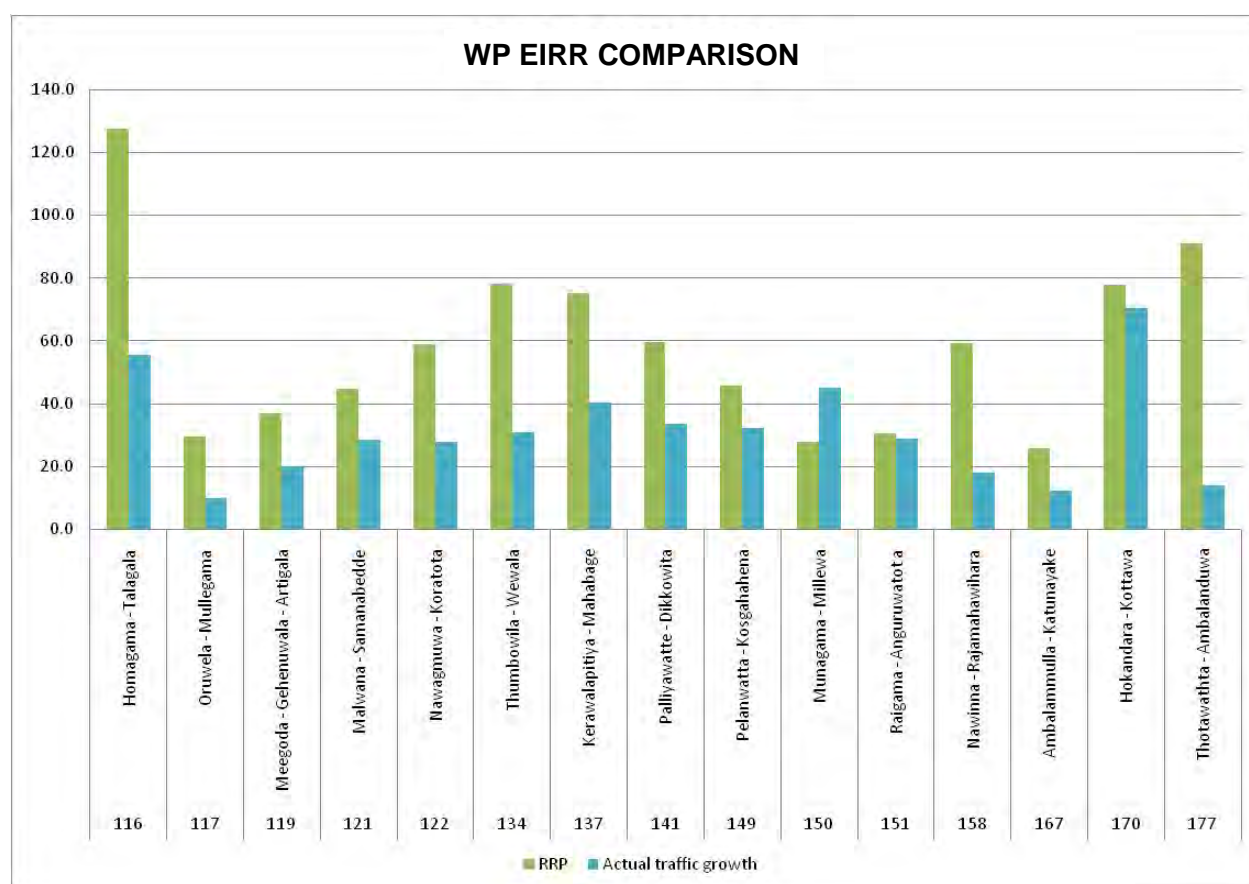


17. Because UV-72 Welikemulla–Medagama–Wevelhinna starts halfway down UV-71 Mailagastenna–Thoranakapolla–Kottegoda, the first section of UV-71 carries traffic related to both roads. To avoid this overlap, 2011 traffic counts were carried out beyond the intersection point, which represents average traffic volume on UV-71.

18. A significant reduction in minibuses using UV-77 Kudaoya–Balaharuwa and UV-76 Balaharuwa–Hambegamuwa from 2000 traffic counts was observed.<sup>7</sup> One reason may be the shift from minibuses to large buses, although large buses have not increased proportionately. The overall EIRR for the five roads in Uva Province is 17.9%.

19. **Western Province.** Figure A6.4 compares the EIRR estimates for the project roads in Western Province.

**Figure A6.4: Comparison of Economic Internal Rates of Return for Western Province**



EIRR = economic internal rate of return, RRP = report and recommendation of the President, WP = Western Province.

Sources: ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI [SF], approved on 19 December); and independent evaluation mission's rapid survey team.

<sup>7</sup> A reduction in the number of minibuses was observed on UV-77 (minus 31) and on UV-76 (minus 52). Large buses increased both on UV-77 (plus 3) and UV-76 (plus 5).

20. All except one project road have a recalculated EIRR of more than 12%. It is also noted that except for one road, all recalculated EIRRs are lower than the RRP estimates. WP-167 Ambalammulla–Katunayake is a narrow road with an EIRR just above 12%. Traffic flow is also very low compared with the other roads in the province. Due to the narrowness of this road no additional traffic gets diverted and the expected travel time savings are also smaller. As the road crosses a residential area, the potential for a traffic flow increase is limited. In fact, a reduction in the number of trucks and buses has been observed. The EIRR of the WP-117 Oruwala–Mullegama, a short link of 0.27 km, is less than 12%. As there is a bridge included in this link, the cost per km is higher than for all other road links. Because of the shorter length, travel time and VOC savings are minimal.

21. There is a significant increase in traffic flow after rehabilitation on WP-116 Homagama–Thalagala, WP-141 Palliyawatta–Dikowita, WP-151 Raigama–Anguruwatota, and WP-170 Hokandara–Kottawa. The overall EIRR for the Western Province roads is 36.26%.

22. **Sensitivity Analyses.** Sensitivity analyses carried out for all project roads and for each province are summarized in Table A6.5. If the traffic growth rate is 30% lower than what was assumed in the base case, the EIRR will decrease, but 27 of the 31 road sections will still be above the 12% threshold.

23. The pavement design for the rehabilitated roads specified double bituminous surface treatment (DBST). The DBST is a low-cost pavement and appropriate for local loads in Sri Lanka. Its lifetime, however, is shorter than that of asphalt concrete pavement—about 3–5 years before surface dressing is needed, the costs of which amount to about 50% of rehabilitation costs. The Western PRA evaluates the lifetime of the DBST at 8 years. The PPER calculated the case of the 10-year evaluation period. Here, the EIRR dropped to a range of –2.5 to 68.2, and 19 of the 31 road sections, more than 60%, could not achieve a 12% EIRR.

**Table A6.5: Sensitivity Analyses**

Road Section No.	Name in PCR	Reevaluation of PPER	EIRR Sensitivity	
			(–30%) Traffic Growth Rate	10-Year Analysis Period
1	Anuradhapura–Arippu	21.5	17.9	11.4
3	Kothalawala	20.2	18.1	9.6
5	Medirigiriya–Chaittya	23.3	20.0	13.9
17	Alisthana–Thuruwila	20.0	17.9	10.8
27	Thalawa–Siyambalangamuwa	7.7	7.8	-4.6
29	Melsiripura–Rambe	25.6	22.5	17.4
32	Hendiyapola–Deduruoya	26.7	22.8	19.1
38	Diulwewa–Galadenigama	20.3	18.3	11.0
40	Bathalagoda–Pangolla	20.1	17.2	10.8
48	Ganewatta–Nagollagama	20.8	17.8	11.6
50	Badagamuwa–Wellawa	20.4	17.4	10.8
71	Mailagastenna–Thoranakapolla–Kottagoda	17.3	15.3	5.6
72	Welikemulla–Medagama–Wevelhinna	11.2	8.8	-1.9
74	Dambagalla–Mariarawa	20.5	18.0	12.9
76	Balaharuwa–Hambegamuwa	18.1	14.6	6.5
77	Kudaoya–Balaharuwa	20.1	16.9	8.9
116	Homagama–Talagala	55.6	52.5	53.5
117	Oruwela–Mullegama	10.0	8.0	-2.5
119	Meegoda–Gehenuwala–Artigala	20.1	17.9	11.4
121	Malwana–Samanabedde	28.5	23.8	21.1
122	Nawagmuwa–Koratota	27.9	24.9	21.3

Road Section No.	Name in PCR	Reevaluation of PPER	EIRR Sensitivity	
			(-30%) Traffic Growth Rate	10-Year Analysis Period
134	Thumbowila–Wewala	30.8	28.5	24.7
137	Kerawalapitiya–Mahabage	40.2	35.7	34.6
141	Palliyawatte–Dikkowita	33.6	30.7	28.0
149	Pelanwatta–Kosgahahena	32.3	28.4	26.1
150	Munagama–Millewa	45.2	40.0	40.8
151	Raigama–Anguruwatota	28.8	26.5	22.1
158	Nawinna–Rajamahawihara	18.2	15.5	7.5
167	Ambalammulla–Katunayake	12.2	10.9	0.0
170	Hokandara–Kottawa	70.6	64.6	68.2
177	Thotawathta–Ambalanduwa	14.1	13.4	3.9
<b>Province</b>				
NC	North Central Province	21.15	18.21	11.26
NW	North Western Province	23.14	20.14	14.52
UV	Uva Province	17.90	15.27	7.61
WP	Western Province	36.26	32.81	31.10
	<b>All 31 Project Roads</b>	<b>27.76</b>	<b>24.75</b>	<b>20.70</b>

EIRR = economic internal rate of return, NC = North Central Province, NW = North Western Province, PCR = project completion report, PPER = project or program performance evaluation report, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

## SUSTAINABILITY OF ASIAN DEVELOPMENT BANK-ASSISTED PROJECTS

### A. Road Maintenance Mechanism and the Trust Fund

1. The Asian Development Bank (ADB) country strategy for Sri Lanka focuses on contributing to sustainable poverty reduction. At the High Level Forum, held on 23 March 2001, the Government of Sri Lanka and ADB concluded that ADB support for the road sector was important for poverty reduction. Better road sector performance was expected to advance economic growth, raising incomes and creating employment, and thereby reducing poverty.

2. ADB's operational strategy for the road sector in Sri Lanka focuses on improving overall sector performance through implementation of institutional and sector reform. ADB-financed technical assistance (TA)<sup>1</sup> had identified inefficiency in the sector and inadequate maintenance linked to lack of institutional capacity as the primary reasons for the poor performance.

3. ADB observed many weaknesses in the approach to financing the provision of roads and their maintenance. It also noted that although road user charges generate substantial government revenues, more than half of these are spent outside the road sector while the amount assigned to the road maintenance expenditure is much too low compared with levels generally recommended for other developing countries. Many roads deteriorate to the extent that they can be restored to good condition only by undertaking major rehabilitation works at much greater cost.

4. The action plan for reorganizing the Road Development Authority (RDA)—referred to as reengineering action plan (REAP) in the report and recommendations of the President (RRP) for the Road Sector Development Project<sup>2</sup> in 2002—included two activities pertaining to road maintenance: (i) strengthening of road maintenance and (ii) road maintenance funding. These were intended to progressively develop the RDA's business processes and enable effective and efficient management of the national highway system.

5. The REAP for strengthening road maintenance management was intended to establish an objective system and to develop capacity for planning and programming of routine and periodic road maintenance works using a pavement management system that used economic rates of return. The routine maintenance management system was planned to be established in 2003 and the annual reports for periodic maintenance to be prepared by 2005. In this pursuit, the recruited consulting firm helped the RDA (i) implement the road maintenance budgeting and expenditure control (RMBEC)<sup>3</sup> system; (ii) install a computer system in the maintenance management unit and all provincial or district division offices; (iii) assist in routine and periodic maintenance performance and budgeting, and carry out studies of maintenance methods and management systems to improve performance; (iv) add bridge maintenance to RMBEC; (v) complete the development and implementation of the pavement management system; (vi) collect the necessary road condition data; (vii) develop an economic pavement maintenance

<sup>1</sup> ADB. 1998. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Reengineering of Road Sector Institutions*. Manila (TA 3110-SRI, approved on 8 December); attached to ADB. 1998. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Road Network Improvement Project*. Manila (Loan 1649-SRI[SF], approved on 8 December).

<sup>2</sup> ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December).

<sup>3</sup> Developed under ADB. 2001. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for the Road Maintenance Budgeting and Expenditure Control*. Manila (TA 3691-SRI, approved on 27 July).

policy, introduce a periodic pavement maintenance and rehabilitation program; and (viii) establish minimum levels of service criteria and provide training in the operation of pavement management software where required.<sup>4</sup>

6. The REAP on road maintenance funding was intended to increase road maintenance financing and streamline road maintenance budgeting and expenditure control so that by 2005, a sustainable road maintenance financing mechanism that would progressively increase maintenance budgets to the levels required to sustain the country's road assets could be agreed on. The government gave its assurance to meet these targets. A consultant was recruited to review existing road user charges and taxes and assess the shortfall. The consultant was also expected to formulate suitable financing mechanisms to reduce this shortfall and to assess the amount that could be raised under different options—if necessary, by establishing a special road funding mechanism—and make recommendations on such a mechanism's structure, composition, necessary management guidelines, legal instruments, performance indicators, and training required to implement it (footnote 4).

7. The RRP also noted that the provincial road administrations (PRAs) had few planning and other skills, nor inventories of road conditions, and did not have objective systems or tools for prioritizing roads for periodic and routine maintenance. The annual budgets for provincial roads are funded mainly from central government allocations and supplemented by revenues raised by provincial councils. The RRP also found that the level of funding was insufficient for councils to adequately maintain their road networks and that there was a need to increase the road budgets and to assign more to road maintenance.

8. The RRP envisaged that the project would transform the selected four PRAs into professional road infrastructure managers with a focus on maintaining the provincial road network efficiently and effectively through better planning, use of planning tools including software for design work and for programming and expenditure control of the road maintenance budget; tendering maintenance and upgrading works; and improving implementation and contract management. New structures were to be introduced to divide responsibilities between headquarters and divisional offices of the agencies, with all road works, except for emergency works, to be contracted out. Modern road management as well as office management practices were to be introduced. Moreover, objective road maintenance estimates were to be prepared for each province on the assurance that the government would, by 2004, allocate a road maintenance budget of 10% more than in 1999 and that provincial councils would (i) establish a dedicated road agency; (ii) ensure that all routine and periodic maintenance is contracted out from 2003; (iii) implement performance-based maintenance contracts for at least 20% of the maintainable road length in 2005; and (iv) apply an approved road maintenance financing mechanism from 2005. A consulting firm was recruited to assist each PRA in implementing the above under the institutional development program (IDP) component of the project.

### **1. National Highways**

9. The road maintenance management system in the RDA has improved since the beginning of the project. However, as noted below, several of the specific outputs set out in the RRP and the project administration memorandum (footnote 4) have not materialized and many of the outcomes have fallen short of expectations.

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<sup>4</sup> ADB. 2003. *Project Administration Memorandum for the Road Sector Development Project (Loan 1986–SRI/SF)*. Manila.

- (i) The RMBEC, which was developed for the maintenance management unit of the RDA, is not used today, as there were technical deficiencies that the consultants could not correct. However, thanks to this process the concept and need for a maintenance program is now well understood and sought after in the RDA.
- (ii) As a consequence, the requirement for the RMBEC to include bridges was not satisfied. The RDA is currently thinking of including the development of a bridge management system under Japanese International Cooperation Agency funding.
- (iii) The introduction of the World Bank's Highway Design and Management Model (HDM-4) as a replacement for the RMBEC, on the other hand, has been more productive, even though the majority of staff trained in HDM-4 are no longer in their divisions and the manuals prepared under the project are not being used. However, the training and documentation obtained under subsequent World Bank technical assistance has supported the continuing use of HDM-4.
- (iv) Given that the actual prioritization of maintenance programs is usually based on a multitude of other technical (e.g., traffic levels, axle loads) and non-technical criteria (e.g., political and social importance), the output of HDM-4 can at present not directly be used in the determination of the final annual maintenance programs, as it was intended to be used for the selection of maintenance activities under the road maintenance trust fund (RMTF).<sup>5</sup>
- (v) While the project collected road condition data for the entire national and the provincial road networks, there was no sustainable program to update this data annually. However, this issue has now been corrected in the RDA with the falling weight deflectometer and the multi-criteria profilometer procured under World Bank assistance, which allows speedy collection of road condition data.

10. Hence, it may be concluded that the consulting services for strengthening maintenance management in the RDA provided by the project have not delivered all the desired outputs.

11. Historically, road maintenance funding has come from budgetary allocations made under the "Road Maintenance" head and after 2006 it was called "Maintenance of Roads and Bridges" (i.e., the RMTF). Maintenance funding represents on average around 5% of total allocation of funds to the RDA. However, as seen in Table 7.1, the intervention of the project on maintenance funding for national highways has been encouraging, with an increase from SLRs1, 116 billion in 2004 to SLRs3, 010 billion in 2006. Since then it has grown but has not kept pace with the increase in capital expenditure.

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<sup>5</sup> ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the National Highways Sector Project*. Manila (Loan 2217-SRI, approved on 15 December).

**Table A7.1: Annual Allocation for Road Maintenance (2004–2011)**

Year	Allocation (SLRs billion)	
	Maintenance	Total
2004	1,116	16,610
2005	1,880	21,064
2006	3,010	37,158
2007	3,410	44,601
2008	3,104	67,140
2009	3,530	90,483
2010	6,725	84,689
2011	5,000	102,296

SLRs = Sri Lanka rupees.

Note: The budget in 2011 was the indicial allocation.

Source: Planning Division, Road Development Authority.

12. Under the provisions of a Trust Ordinance, an RMTF has been set up. The Cabinet approval was granted on 26 October 2005 (as a condition for loan negotiations of the project). A board of trustees was appointed by the secretary of the Treasury to facilitate the initial arrangements for the RMTF. The board consisted of the deputy secretary of the Treasury as chairman, the secretary of the Ministry of Highways (MOH)<sup>6</sup> or his successor, and the chairman of the Finance Commission (footnote 5).

13. In addition to the board, the Treasury secretary appointed a technical advisory committee with representatives from the Ministry of Finance and Planning, the MOH, the Ministry of Provincial Council and Local Government, the National Contractor Association, freight forwarders, the National Transport Commission, and academia and other stakeholders specializing in fields relevant to road transport. The committee was chaired by the secretary of the MOH.

14. The RMTF was operational in 2006 with a budgetary allocation of SLRs3 billion. This has increased to SLRs5.0 billion for 2011. There is as yet no arrangement for direct contribution to the fund from a fuel levy as envisaged. The fund itself operates only as a separate budget item, since the Treasury was opposed to external management of a full-fledged fund. The intended outcome of having a road fund to have total control over its disbursements has not materialized yet.

15. The technical capability to manage funds for maintenance has not improved. Therefore, maintenance management remains the same, as do the method of distributing these funds and the non-application of performance indicators. Consultancy services had been procured under a World Bank TA to establish guidelines, manuals, and procedures, and to train staff at the Ministry of Finance and Planning in managing the RMTF. This consultancy did not produce the desired outcomes partly due to the poor consultant performance and because the Treasury did not recruit or designate staff for this purpose.

16. The extension of a road fund to the provinces has not happened due to initial concerns of the provincial councils that such an action would lead to a reduction of central government funding that now provides for provincial road maintenance. However, at present there appears to be greater awareness of the functions and the benefits of such a fund.

<sup>6</sup> Which would now be the Ministry of Ports and Highways.

17. In 2010, responsibility of the RMTF was transferred from the Ministry of Finance and Planning to the Ministry of Ports and Highways (MOPH) with the Extraordinary Gazette Notification No. 1651/20 of 30 April 2010. The World Bank TA was training MOPH staff in the management of a road fund until September 2011. In addition, under the World Bank TA, \$5 million has been pledged to this fund.

## 2. Provincial Roads

18. In trying to improve the use of planning tools by the PRAs, the RMBEC and provincial road inventories were developed in 2005. The PRAs did use these in compiling their 2006 budget estimates but most of them gave up on the RMBEC after 2007, when the consultants could not correct the technical problems that arose in updating the road inventory database. Hence the data collected in 2005 has not been updated and the program is largely unused today. Even though officers have been trained in the use of the HDM-4 from every PRA under the project, this was ineffective as a consultant was economist and he explained only economic evaluation sections.

19. In the case of the provincial roads, funds received for road maintenance from central government through the Finance Commission have remained relatively unchanged for all PRAs. These allocations are made under the budget code "Recurrent Expenditure—Buildings and Structures" and have to compete with other, non-road-maintenance requirements. Each provincial council also votes on maintenance expenditure from its own revenues, but these allocations are driven largely by political concerns, without consideration of road network requirements. The actual funding for maintenance of provincial roads has remained at 40%–70% or, as a rule of thumb, an average expenditure of SLRs100,000 per kilometer (km), except for Western Province, which has a significantly higher revenue income from annual licensing of motor vehicles.

20. The North Central provincial council increased its budgetary allocation for the maintenance of its roads rehabilitated under the project. Uva Province, on the other hand, has been able to secure a subsequent World Bank project that includes a component for maintenance of previously rehabilitated roads. In Western Province, the PRA has been able to obtain from the provincial council a greater share of vehicle-licensing revenue for road maintenance work. However, no level of government or government agency has yet developed a mechanism to determine and sustain the level of financing required for road maintenance.

## B. Performance-Based Maintenance

21. A loan covenant of the project required that performance-based maintenance contracts for a duration of 5–7 years were to be implemented from 2005 for the 20% of the provincial road network in maintainable condition. However, there has been no consistent and sustainable increase in maintenance funding to the PRAs. Except for the Western PRA, the funds available for road maintenance are much below the required level, and the implementation of performance-based contracts is made difficult since contracts have to be negotiated at values far below the expenditure needed to ensure quality. In most cases therefore, all contracts are renewed irrespective of the contractor's previous performance. However, the Western PRA suggested that the performance-based concept was better suited to the management of maintenance work as it was more efficient, less costly, and easier to manage.

22. **Western Province.** The project helped the Western PRA develop a maintenance management program that it used to request that a portion of the annual vehicle-licensing



revenue received by the provincial council be made available for road maintenance. Consequently, the Western PRA was able to increase its funding for maintenance from SLRs100 million in 2006 to around SLRs500 million in 2010, with an increase to SLRs600 million anticipated for 2011. The Western PRA introduced performance-based maintenance contracts for the rehabilitated roads in the province after the completion of the project. In 2010, a total of 10 such contracts covering approximately 250 km was implemented, while an equal length of additional roads is targeted for 2011. These contracts are awarded for 1–2 years on the basis of competitive bidding and the monthly cost has ranged from SLRs6,000 to SLRs10,000 per km. Monthly performance assessments are made by the divisional executive engineer of the Western PRA, who certifies payment. Several contracts have been terminated due to non-achievement of quality levels, such as being free of edge failure, rutting, and potholes. It is reported that performance-based maintenance contracts appear to cost less than direct-labor maintenance. However, this has not been done for roads requiring rehabilitation, as they are costly. Hence the rate at which roads would be included in this scheme in future will depend on the rate at which rehabilitation is completed.

23. **North Western Province.** Based on the availability of inventory data and consulting services provided under the project, the North Western PRA started contracting out maintenance to the private sector in 2007. It awarded 38 contract packages of 3-year duration, each package accounting for about 50 km, with a maximum of two packages per contractor. The current coverage of the maintenance done through contracts is about 1,700 km, out of a network of 2,246 km. The North Western PRA explained that the remaining sections are not in good enough condition to contract out maintenance work to the private sector and are waiting for rehabilitation or improvement. The current budget for contracting out maintenance is about SLRs100 million, which means that the monthly average expenditure on maintenance of these roads is about SLRs5,300 per km. The North Western PRA thinks that this rate should be around SLRs10,000 per km per month for performance-based contracts to be fully implemented. In contrast to the Western PRA's case, the North Western PRA has applied the policy of private sector participation for maintenance to increase coverage of maintained roads within the limited budget. As a result, it is unable to enforce the required standards of performance-based contracts. Unlike the situation in the Western Province, the contractors are not adequately assessed and hardly risk being terminated for poor performance. On completion of the first 3-year contract, all contracts were extended for an additional year.

24. **North Central Province.** The North Central PRA maintains 1,750 km of provincial roads but has not yet implemented performance-based maintenance, since the allocated budget for maintenance was not sufficient. The North Central PRA has received an increase in maintenance allocation from SLRs50 million in 2010 to SLRs75 million in 2011 on account of the need to maintain the rehabilitation of the roads developed under the project. Road maintenance in North Central Province is carried out using direct labor as before.

25. **Uva Province.** The Uva PRA has not yet introduced performance-based maintenance, as there is no policy decision on this. Since 2000, road sections in good condition are in the care of local residents who have been appointed to provide clearing, cleaning, and assistance for premix applications for potholes over a 3 km section of road for a monthly fee of SLRs2,500. The Uva PRA calls this "community participation maintenance" and currently keeps 150 people with such contracts. Other maintenance activities are handled by the Uva PRA's own workforce.

26. The unavailability of outputs from the RMBEC program, which would have provided updated maintenance requirements, has been another drawback in developing performance-based contracts and streamlining maintenance management. However, the PRAs report that

even the efforts to derive data based on initial data inputs yield very high cost estimates for maintenance, which is not practical as it would allow improvement of only a very few km per year. Thus, in the North Western PRA, for example, maintenance funds are distributed via a uniform rate by dividing the annual allocation across the road length considered to need intervention over a given year.

27. The project was to increase maintenance funding but it has not materialized in a sustainable basis. Neither has the performance-based contracting become fully operational outside Western Province.

28. Performance-based contracts for road maintenance are also to be implemented by the RDA in 2011, for a section of the A4 National Highway. As well, several 3-year performance-based contracts will be tendered for the maintenance of the Southern Transport Development Project, once it is commissioned.

## SOCIOECONOMIC ASSESSMENT

1. **Introduction.** The Road Sector Development Project <sup>1</sup> (RSDP) financed the rehabilitation of provincial roads in four provinces of Sri Lanka. The upgrading of existing roads to a maintainable standard, and widening where possible, was expected to contribute to an increase in economic activity. It was expected that at project completion there would be greater freight and passenger flows and access to economic and social services in the project areas, shorter travel times, and better transport services. The project improved 780 kilometers of provincial roads. This appendix summarizes assessments on the anticipated and unanticipated (positive and negative) impacts of the project on the local communities in the project's area of influence. The assessments are drawn from a field survey carried out by the social sector expert during January and February 2011.

2. **Methodology.** The independent evaluation mission carried out a rapid benefits survey on 10 selected road sections in four provinces that were rehabilitated under the RSDP. Four project roads in Western Province and two each in North Central, North Western, and Uva provinces were selected for the analysis. Table A8.1 shows the 10 roads. For each road, 80 household samples were selected as sampling units using a stratified random sampling method. Households near the two endpoints of the project roads and in the midpoint were purposefully selected in the initial stage. The second stage involved the random selection of households by the roadside and within 100 meters of the road.

**Table A8.1: Road Projects Selected for the Field Survey**

Province	Road Section		Length (km)
	Number	Name	
NC	1	Anuradhapura–Arippu	18.59
	3	Kothalawala	5.42
NW	29	Malsiripura–Rambe	14.3
	40	Bathalagoda–Pangolla	3.86
UV	71	Mailagastenna–Thoranakapolla–Kottagoda	7.41
	77	Kudaoya–Balaharuwa	12.85
WP	116	Homagama–Talagala	7.55
	141	Palliyawatte–Dikkowita	2.22
	151	Raigama–Anguruwatota	3.22
	170	Hokandara–Kottawa	3.9

km = kilometer, NC = North Central Province, NW = North Western Province, UV = Uva Province, WP = Western Province.

Source: Independent evaluation mission's rapid survey team.

3. **Summary of survey findings.** Overall, the project appears to have significantly reduced travel time; provided better transportation facilities such as bus services; improved accessibility to schools, health centers, and areas of economic activity; and increased economic activities and the values of properties. However, there are still unresolved issues. These include lack of signage, road erosion, and the need for better drainage systems.

4. A brief description of each project with related demographic information is in Table A8.2. The *Grama Niladhari* divisions<sup>2</sup> listed are the divisions through which the project road passes.

<sup>1</sup> ADB. 2002. *Report and Recommendations of the President to the Board of Directors: Proposed Loan and Technical Assistance Grants to the Democratic Socialist Republic of Sri Lanka for the Road Sector Development Project*. Manila (Loan 1986-SRI[SF], approved on 19 December).

<sup>2</sup> The *Grama Niladhari* division is the lowest administrative unit in Sri Lanka.

Table A8.2: Brief Description of Selected Road Projects

Road No.	Road Name	GN Divisions Directly Served	2001 Population	Description
1	Anuradhapura–Arippu	Pusiyankulama	1153	Before rehabilitation, the road was not used after 7:00 p.m. At the time of the independent evaluation mission (IEM), buses were seen on the road. This is the main access road to an ancient temple in Thanthirimale, and in June and on full moon (Poya) days there is considerable traffic from pilgrims. The project-derived benefits named by the villagers include time savings, especially shorter travel times to town, hospital, and school. But villagers also pointed out the lack of proper signboards along the road and erosion at the edges of the road.
		Abayawewa	1466	
		Devanampiyatissa Pura	4350	
3	Kothalawala	Bubula	697	This road was rehabilitated about 4–5 years ago and people use it to travel between Polonnaruwa and Hingurakgoda. According to the villagers, traffic has doubled since the rehabilitation. Three bus routes operate on this road: Kaduruwela–Polonnaruwa, Jayanthipura–Chandanapokuna, and Saranasiriyawa–Kaduruwela. Buses run once every hour. Land prices have gone up slightly. One issue not solved by the project is that the road near the bridge gets flooded in the rainy season.
		Raja Ela Gama	867	
29	Malsiripura–Rambe	Makulpotha	523	This road has been widened and traffic has increased since then. The villagers find it easier and less time-consuming to travel and they say that the bus service has improved. School children benefit as schools become more accessible. Land prices in the area have increased.
		Kosgaha Ela	658	
		Nikawehera	1971	
		Halmillawewa	1588	
		Kerelankadawala	1079	
		Madahapola	1072	
		Baddegama	1199	
		Gurussa	931	
		Ussawa	1140	
		Diyathure	1148	
Medamulla	563			
40	Bathalagoda–Pangolla			The rehabilitated Bathalagoda–Pangolla road is narrower at 3.6 m than the pre-rehabilitation road, which was 6 m wide and did not have a proper drainage system. Despite the narrower road, travelling has become easier and less time-consuming. The previous road did not meet standards and was heavily damaged.
71	Mailagastenna–Thoranakapolla–Kottagoda	Badulla South	3362	This road was rehabilitated and widened about 3 years ago. The villagers reported that the contractors seemingly neglected to protect the edges from eroding, resulting in landslides that damaged some houses. Two buses run on this road segment but because the service level is insufficient, villagers use three-wheelers to travel short distances. Villagers pointed out that the lack of a proper drainage system becomes a problem in the rainy season. <sup>3</sup>
		Higurugamuwa	3481	
		Medagama	1650	
		Kottagoda	2199	
		Kandana	1990	
77	Kudaoya–Balaharuwa	Balaharuwa	2038	There are road closures here during the rainy season. The proposal to replace the existing culverts with box culverts has not been implemented. Nonetheless, there are benefits from the rehabilitated road. Bus service has improved, with four new private buses operating on the road. A part of the road passes over the Dembaraja
		Debara Ara	1259	

<sup>3</sup> Improvement of the drainage system was not included in the project design. There was a gap between the project outputs and what the local people expected from the project.

Road No.	Road Name	GN Divisions Directly Served	2001 Population	Description
				tank bund and has not been rehabilitated because irrigation authorities refused to grant the necessary permit. Two schools are accessible from this road. The villagers remarked on the lack of signboards and the absence of pedestrian crossings near schools.
116	Homagama–Talagala	Homagama Town	3226	This road was unusable before the rehabilitation. The independent evaluation mission observed very high vehicle movement on this road, especially in peak hours. Rehabilitation also resulted in shorter travel times, better bus services, and higher land values. An issue raised by villagers is the uneven width of the road—in some areas the road becomes too narrow for two vehicles.
		Pitipana Town	2602	
		Kiriberiyakele	2673	
		Prasannapura	1851	
		Pitipana North	2785	
		Pitipana South	1667	
		Suwapubudugama	1601	
		Beruketiya		
		Thalagala North	2425	
151	Raigama–Anguruwatota	Kothalawala	1869	Before the project, buses traveled only up to Keselhenawa. Since the road was rehabilitated and a bridge was built, buses travel to Anguruwatota. The villagers enjoy shorter and easier traveling. Buses run every hour from 4:30 a.m. to 10:50 p.m. New shops have been constructed and incomes from the shops have increased.
		Raigama East	1477	
		Bellanthuduwa	2036	
		Haltota	816	
		Lenawara	1753	
		Kennathudawa	867	
		Yalagala	965	
		Pethigamuwa South	1010	
		Dombagoda	1037	
		Keselhenawa	1100	
		Madurawela West	654	
170	Hokandara–Kottawa	Liyanagoda	3392	This road section was rehabilitated about 6 years ago and is in much better condition. Bus service has improved, travel times are shorter, and trips more convenient. Land prices have also gone up. However, villagers report more accidents and have expressed concern over the noise pollution from the traffic.
		Kottawa East	3861	
		Kottawa South	6231	
		Kottawa Town	5640	
		Makumbura North	3021	

GN = *Grama Niladhari*.

Sources: Department of Census and Statistics, and Independent Evaluation Department.

## A. Positive Impacts from the Project

5. **Economic benefits.** Evidence of economic benefits includes (i) higher land values, (ii) growth in small businesses and higher incomes of existing roadside shops, (iii) higher agricultural production, (iv) shorter travel times to market areas, and (v) better housing and living standards. The higher land values were considered the most important economic benefit from the project. The reported increase in income from survey respondents was highest in North Western Province. Economic benefits from the project are summarized in Table A8.3.

**Table A8.3: Economic Benefits from the Project**

Item	Benefit
Higher property values	All road segments surveyed reported an increase in property values since the rehabilitation of the roads. Ninety-five of the beneficiaries from the Homogama–Talagala road named increasing land values as the most important benefit from the project. Property values have risen 100% along this road segment.
Brisker economic activity	New shops have sprung up along the rehabilitated roads, and existing shops and other small businesses report higher sales and higher incomes. Higher traffic volumes and faster turnover of passengers have resulted in lower vehicle operating costs and higher incomes.
Agricultural production	Better road conditions, more bus services, and shorter travel times have contributed to greater agricultural productivity. It is now more convenient to bring agricultural inputs to the farms and agricultural outputs to the markets. Better access to wholesale markets was a significant benefit in Uva Province.
Shorter travel times	Shorter travel times allow farmers to market their produce faster, and have made going to school and other social and health centers more convenient.
Better housing and living standards	Better economic conditions have ushered in better living standards and have paved the way for more permanent houses.

Source: Independent evaluation mission's rapid survey team.

6. **Social benefits.** Social benefits reported by the survey respondents include greater travel comfort, easier access to health care and education, especially in North Central Province, and better employment opportunities. The rehabilitated roads make social interaction between households easier. Public transportation has become more available along the project roads, which is particularly significant because of the low vehicle ownership in the project areas.

## **B. Adverse Impacts of the Project**

7. The project also had some adverse impacts. Households along the project roads, notably in Western Province, have reported more dust and noise pollution. Respondents from North Central Province feel that accidents have increased, possibly due to lack of road signage, road erosion, and higher traffic volumes. Project roads, especially in Western Province, have been flooded due to poor drainage, erosion, and landslides in some areas.