Document of

The World Bank

Report No: ICR2475

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-47640)

ON A

LOAN

IN THE AMOUNT OF USD620.00 MILLION EQUIVALENT

TO

INDIA

FOR THE

LUCKNOW- MUZAFFARPUR NATIONAL HIGHWAY PROJECT

December 13, 2012

Sustainable Development Department
India Country Management Unit
South Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective October 31, 2012)
Currency Unit = Indian Rupee (INR)
INR 1.00 = USD 0.018589
USD 1.00 = INRs.53.795

FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

ABP	Allahabad Bypass Project
BOT	Build-Operate-Transfer
BOQ	Bill of Quantities
CAG	Comptroller and Auditor General of India
DEA	Department of Economic Affairs
EMP	Environmental Management Plan
GoI	Government of India
GTRIP	Grand Trunk Road Improvement Project
ICR/ICRR	Implementation Completion and Results Report
INT	Integrity Vice Presidency
ISR	Implementation Status and Results Report
LA	Land Acquisition
LMNHP	Lucknow-Muzaffarpur National Highway Project
M&E	Monitoring And Evaluation
MORTH	Ministry of Road Transport and Highways
MTR	Mid Term Review
NGO	Non-Government Organization
NHAI	National Highways Authority of India
NHDP	National Highways Development Project
O&M	Operation and Maintenance
PAD	Project Appraisal Document
PIU	Project Implementing Unit
QAG	Quality Assurance Group
RAP	Resettlement Action Plan
R&R	Resettlement and Rehabilitation
TNHP	Third National Highway Project
UP	Uttar Pradesh
VOC	Vehicle Operating Cost

Vice President:	Isabel M. Guerrero
Country Director:	Onno Ruhl
Sector Manager:	Karla Gonzalez Carvajal
Project Team Leader:	Rajesh Rohatgi
ICR Team Leader:	Sri Kumar Tadimalla

INDIA

Lucknow-Muzaffarpur National Highway Project

C O N T E N T S

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MAP – IBRD 33344

A. Basic Information			
Country:	India	Project Name:	Lucknow-Muzaffarpur National Highway Project
Project ID:	P077856	L/C/TF Number(s):	IBRD-47640
ICR Date:	12/13/2012	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF INDIA
Original Total Commitment:	USD 620.00M	Disbursed Amount:	USD 615.70M
Revised Amount:	USD 620.00M		
Environmental Category: A			
Implementing Agencies: National Highways Authority of India			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	06/24/2003	Effectiveness:	12/28/2005	12/28/2005
Appraisal:	07/19/2004	Restructuring(s):		05/04/2010 06/22/2012
Approval:	12/21/2004	Mid-term Review:	03/31/2007	01/31/2008
		Closing:	06/30/2010	06/30/2012

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Moderately Unsatisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Moderately Unsatisfactory
Borrower Performance:	Moderately Unsatisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry:	Moderately Unsatisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Moderately Unsatisfactory	Implementing Agency/Agencies:	Moderately Unsatisfactory
Overall Bank Performance:	Moderately Unsatisfactory	**Overall Borrower Performance:**	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	Moderately Unsatisfactory (QALP Review)
DO rating before Closing/Inactive status:	Moderately Satisfactory		

D. Sector and Theme Codes		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Forestry	1	1
Other social services	3	13
Roads and highways	96	86

Theme Code (as % of total Bank financing)		
HIV/AIDS	25	1
Infrastructure services for private sector development	50	98
Injuries and non-communicable diseases	25	1

E. Bank Staff		
Positions	**At ICR**	**At Approval**
Vice President:	Isabel M. Guerrero	Praful C. Patel
Country Director:	Onno Ruhl	Michael F. Carter
Sector Manager:	Karla Gonzalez Carvajal	Guang Zhe Chen
Project Team Leader:	Rajesh Rohatgi	Piers Antony Vickers
ICR Team Leader:	Sri Kumar Tadimalla	
ICR Primary Author:	Sri Kumar Tadimalla	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The project development objective is for road users to benefit from an improved journey between Lucknow and Muzaffarpur.

Revised Project Development Objectives (as approved by original approving authority)

To improve the journey on NH-28 between Lucknow and the Uttar Pradesh/Bihar Border, and to support NHAI in improving safety and sustainability of the project corridor.

Note: In PAD & Restructuring Paper, absolute target values of PDO indicators didn't match % reductions envisaged in PAD and appeared to be even more challenging. Hence, % reduction targets are used for comparison for consistency. For further details, please see Annex 10 of ICR.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Vehicle Travel Time (in mins) - Car S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur Baseline data pertains to Year 2002			
Value quantitative or Qualitative)	S1 - 115 S2 - 110 S3 - 137 S3* - 145 S4 - 171	S1 - 92 (20% reduction) S2 - 88 (20% reduction) S3 - 110 (20% reduction) S4 - 137 (20% reduction)	S1 - 92 (20% reduction) S2 - 88 (20% reduction) S3* -116 (20% reduction) S4 - Deleted	S1 - 95 (17%) S2 - 100 (9%) S3 - 90 (38%) S4 - n.a.
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The target of 20% reduction achieved in project corridor (23%) and in one section (S3* -38%).			
Indicator 2:	Vehicle Travel Time (in mins) - Truck S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur Baseline data pertains to Year 2002			
Value quantitative or Qualitative)	S1 - 199 S2 - 165 S3 - 173 S3* - 183 S4 - 198	S1 - 159 (20% reduction) S2 - 132 (20% reduction) S3 - 138 (20% reduction) S4 - 158 (20% reduction)	S1 - 159 (20% reduction) S2 - 132 (20% reduction) S3*- 146 (20% reduction) S4 - Deleted	S1 - 150 (25%) S2 - 119 (28%) S3 - 140 (23%) S4 - n.a.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The target of 20% reduction achieved in project corridor (25%) and in all sections.			
Indicator 3:	Vehicle Operating Cost (Rs./Km) - Car S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur Baseline data pertains to Year 2002			
Value quantitative or Qualitative)	S1- 4.07 S2 - 4.65 S3/S3* - 3.67 S4 - 3.81	S1 - 3.66 (10% reduction) S2 - 4.19 (10% reduction) S3 - 3.30 (10% reduction) S4 - 3.43 (10% reduction)	S1 - 3.66 (10% reduction) S2 - 4.19 (10% reduction) S3*-3.30 (10% reduction) S4 - Deleted	S1 - 3.50 (14%) S2 - 3.50 (25%) S3 - 3.50 (5%) S4 - n.a.
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The target of 10% reduction achieved in project corridor (15%) and in two sections.			
Indicator 4:	Vehicle Operating Cost (Rs./Km) - Truck S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur Baseline data pertains to Year 2002			
Value quantitative or Qualitative)	S1 - 14.06 S2 - 10.27 S3/S3* - 13.30 S4 - 13.57	S1 - 12.65 (10% reduction) S2 - 9.24 (10% reduction) S3* - 11.97 (10% reduction) S4 - 12.21	S1 - 12.65 (10% reduction) S2 - 9.24 (10% reduction) S3* - 11.97 (10% reduction) S4 - Deleted	S1 - 13.10 (7%) S2 - 13.00 (-27%) S3 - 13.00 (2%) S4 - Deleted
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The target of 10% reduction not achieved in project corridor (-4%) and in any of the sections.			
Indicator 5:	No. of Road Accidents - Fatal S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur Baseline data pertains to Year 2002			
Value quantitative or	S1 - 41 S2 - 22	S1 - 37 (10% reduction)	S1 - 37 (10% reduction)	S1 - 32 (22%) S2 - 43 (-95%)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Qualitative)	S3 - 98 S4 - 104	S2 - 20 (10% reduction) S3 - 88 (10% reduction) S4 - 94 (10% reduction)	S2 - 20 (10% reduction) S3* - 88 (10% reduction) S4 - Deleted	S3 - 29 (70%) S4 - n.a.
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The target of 10% reduction achieved in project corridor (36%) but not in Section S2.			
Indicator 6:	No. of Road Accidents - Non-fatal S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3 - Gorakhpur-Gopalganj (original); S3* - Gorakhpur-Bihar border (revised); S4 - Gopalganj -Muzaffarpur			
Value quantitative or Qualitative)	S1 - 277 S2 - 121 S3 - 239 S4 - 285	S1 - 249 (10% reduction) S2 - 109 (10% reduction) S3 - 215 (10% reduction) S4 - 257 (10% reduction)	S1 - 249 (10% reduction) S2 - 109 (10% reduction) S3* - 215 (10% reduction) S4 - Deleted	S1 - 138 (50%) S2 - 228 (-88%) S3 - 92 (61%) S4 - n.a.
Date achieved				09/30/2012
Comments (incl. % achievement)	The target of 10% reduction achieved in project corridor (28%) but not in Section S2.			
Indicator 7:	User satisfaction with National Highways in the region to be improved			
Value quantitative or Qualitative)	No baseline survey done	No quantitative targets	Deleted at the time of restructuring	n.a.
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	This indicator has been deleted at the time of restructuring.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Avg cost overrun (physical contingencies) -%			
Value (quantitative	n.a.	No quantitative targets	Deleted in March 2010	n.a.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
or Qualitative)				
Date achieved		12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The indicator is deleted, but there has been a weighted average cost overrun of 128% across eight packages. Package-wise details are given in Annex 11 of ICR.			
Indicator 2:	Avg time overrun (in months)			
Value (quantitative or Qualitative)	n.a.	No quantitative targets	Deleted in March 2010	n.a.
Date achieved		12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The indicator is deleted, but there has been a weighted average time overrun of 95% across eight packages. Package-wise details are given in Annex 11 of ICR.			
Indicator 3:	Survival Rate of Afforested Trees			
Value (quantitative or Qualitative)	n.a.	No quantitative targets	-	Ranged from 50% to 80%.
Date achieved		12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The survival rate of afforested trees in the eight packages varied from 50% (packages 2 & 5), 62% (package 3), 70% (in packages 1, 4 and 8) and 80% (in packages 6&7)			
Indicator 4:	Ex-post ERRs (%) S1 - Lucknow-Ayodhya, S2 - Ayodhya-Gorakhpur; S3* - Gorakhpur-Bihar border (revised).			
Value (quantitative or Qualitative)	n.a.	26%	No change	26%
Date achieved		12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	The project corridor EIRR: 26% Section 1 - 28%; Section 2: 29% and Section 3: 18%			
Indicator 5:	Safer-Greener Highway Pilot			
Value (quantitative or Qualitative)	n.a.	n.a.	Ex-post stakeholder satisfaction survey showing increase in satisfaction and reduced fatal accidents	Not achieved
Date achieved			05/04/2010	09/30/2012

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	Not achieved			
Indicator 6 :	Unqualified Internal Audits except for policies outside NHAI domain			
Value (quantitative or Qualitative)	n.a.	--	No overdue actions on audit reports	Internal Audit ToRs duly revised with a mechanism of review by board level audit committee
Date achieved			05/04/2010	09/30/2012
Comments (incl. % achievement)	Internal Audit ToRs duly revised with a mechanism of review by board level audit committee.			
Indicator 7 :	Unqualified SOE audit reports till FY 10-11			
Value (quantitative or Qualitative)	n.a.	-	Error-free Accounts	Achieved
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	Achieved			
Indicator 8 :	ERP			
Value (quantitative or Qualitative)	No ERP	-	ERP Operational in NHAI	Not achieved
Date achieved	12/22/2004	12/22/2004	05/04/2010	09/30/2012
Comments (incl. % achievement)	Not achieved.			

G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	05/16/2005	Satisfactory	Satisfactory	0.00
2	11/18/2005	Satisfactory	Satisfactory	0.00
3	05/30/2006	Satisfactory	Satisfactory	95.77
4	12/07/2006	Satisfactory	Satisfactory	111.99
5	06/06/2007	Satisfactory	Moderately Satisfactory	166.67

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
6	12/28/2007	Satisfactory	Moderately Satisfactory	247.90
7	06/29/2008	Satisfactory	Moderately Satisfactory	282.67
8	12/29/2008	Unsatisfactory	Unsatisfactory	330.75
9	05/31/2009	Unsatisfactory	Unsatisfactory	372.00
10	11/30/2009	Unsatisfactory	Unsatisfactory	428.75
11	03/19/2010	Unsatisfactory	Unsatisfactory	470.46
12	11/11/2010	Moderately Satisfactory	Moderately Satisfactory	547.28
13	03/07/2011	Moderately Unsatisfactory	Moderately Unsatisfactory	593.36
14	10/16/2011	Moderately Satisfactory	Moderately Satisfactory	607.45
15	06/21/2012	Moderately Satisfactory	Moderately Satisfactory	607.45

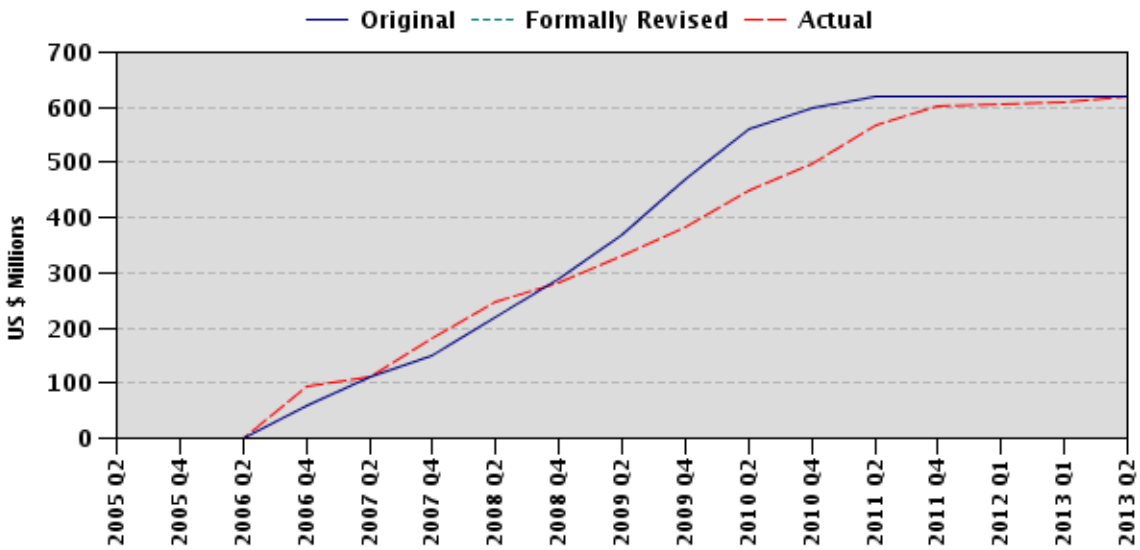
H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
05/04/2010	Y	U	U	486.48	The project was restructured to: (i) remove four poorly performing contracts (in the state of Bihar); (ii) address deterioration of safety in the construction zones; and (iii) overcome shortcomings in the existing financial accounting and reporting systems.
06/22/2012		MS	MS	607.45	The restructuring was done for cancellation of two poorly performing components – Safer-Greener Highway Pilot and Implementation of a new ERP system and reallocation of the funds budgeted for them to the Highway Upgrading component.

If PDO and/or Key Outcome Targets were formally revised (approved by the original approving body) enter ratings below:

	Outcome Ratings
Against Original PDO/Targets	Moderately Unsatisfactory
Against Formally Revised PDO/Targets	Moderately Satisfactory
Overall (weighted) rating	Moderately Unsatisfactory

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. The National Highway sub-system plays a critical role in India's transport networks. This arterial road system represents less than two percent of the total road length in the country but carries over 40% of the road traffic. In the decade leading up to the appraisal of the Lucknow-Muzaffarpur National Highway Project (LMNHP), the national highway sub-sector witnessed some significant changes including increased outlays. In 1998, Government of India (GoI) launched the National Highways Development Project (NHDP) – a flagship program to alleviate congestion, slow speeds, high vehicle operating costs and poor safety, through a combination of higher investment and better management. NHDP ushered in a variety of new institutional, financing and contracting practices (for more details, see Annex 12). As of end-2004, under the aegis of NHDP, more than 3,200 km of National Highways were already upgraded and work was in progress on upgradation of an additional 3,700 km; nearly 800 km of these roads were contracted through the BOT approach.[1]

2. The World Bank recognized the strategic significance of NHDP right from its inception and started supporting it through lending operations prepared and approved in quick succession, viz., Third National Highway Project (TNHP, USD516 million, June 2000), Grand Trunk Road Improvement Project (GTRIP, USD589 million, June 2001), and Allahabad Bypass Project (ABP, USD240 million, September 2003). LMNHP, the fourth operation in this series, was approved in December 2004 with a loan amount of USD 620 million.

3. The four Bank-financed projects, with a combined loan amount of nearly USD 2 billion, had similar project development objectives and implementation procedures. The principal thrust of all the four lending operations was to support upgrading of selected national highways (covering a combined length of 1,463 km) through the traditional, BoQ-type contracts. The first three projects – namely, TNHP, GTRIP and ABP – also included some technical assistance to support capacity building and/or institutional strengthening elements such as, for example, corridor management, road safety works, road asset management, Public Private Partnership (PPP), corporate plan and training.[2]

4. *Rationale for Bank Involvement:* At a macro level, LMNHP was consistent with the GoI's major policy goals for the transport sector enunciated in the Tenth Plan (2002-07), [3] and the then Bank Group's Country Strategy for India, wherein highway

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[1] *Project Appraisal Document: Lucknow-Muzaffarpur National Highway Project*, The World Bank, November 2004.

[2] For example, while TNHP and GTRIP broadly sought to focus on aspects related to road safety and computerized road information/asset inventory systems, ABP envisaged support to undertaking independent and periodic surveys of road users and road sector stakeholders to determine the level of their awareness, involvement and satisfaction with the delivery, management and operation of national highways by NHAI. GTRIP also included some support for a Public Private Partnership (PPP) concession.

[3] These goals included: (i) meeting the transport demand generated by a higher rate of GDP growth; (ii) ensuring transport development is balanced, with special attention to remote regions such as the North-

bottlenecks were identified as one of the major constraints to poverty reduction and private sector-led growth.

1.2 Original Project Development Objectives (PDO) and Key Indicators

5. The project development objective was for road users to benefit from an improved journey between Lucknow and Muzaffarpur (483 km). The performance indicators and targets to measure the achievement of this development objective by the end of project, were:[4]

- vehicle travel time along the project road reduced by at least 20 per cent;
- truck operating costs along the project road reduced by at least 10 per cent;
- number of fatal road accidents along the project road reduced by 10 per cent; and
- user satisfaction with national highways in the region improved.

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification:

6. ***First Restructuring:*** In May 2010, the Board approved the restructuring of the project to: (i) remove four poorly performing contracts (in the state of Bihar); (ii) address deterioration of safety in the construction zones; and (iii) overcome shortcomings in the existing financial accounting and reporting systems. As part of this, the PDO was revised: "To improve the journey on NH-28 between Lucknow and the Uttar Pradesh (UP)-Bihar Border, and to support National Highways Authority of India (NHAI) in improving safety and sustainability of the project corridor."

7. ***Changes to Indicators:*** The three original key indicators and corresponding targets to measure the PDO – namely, travel time, vehicle operating costs and fatal accidents - were revised in line with the reduced length of the project corridor.[5] Also, the scope of one of these indicators (*no. 3 – number of fatal accidents along the project road*) was modified to include fatal accidents during construction and operation. The fourth PDO indicator from the original set – that is, improvement of the user satisfaction with national highways in the region – was dropped. In addition, the following indicators were included to measure the intermediate outcomes of the three activities added during restructuring:

East; (iii) capacity augmentation, quality and productivity improvements through technology upgrading; and (iv) greater emphasis on safety, energy efficiency, environmental conservation and managing social impacts.

[4] For various key indicators, the PAD indicated the targets in terms of absolute numbers as well as percentage reductions vis-à-vis baseline data. These two sets were not matching and the absolute numbers appeared to be relatively higher and even more challenging. Hence, the ICR team relied on the "percentage-reduction" targets envisaged in PAD.

[5] Here too, for reductions in travel time, VoCs and accidents, the restructuring paper used the absolute target numbers from PAD, modified to reflect the removed packages. In order to maintain consistency, the ICR team relied on the "percentage-reduction" targets. Also, as the length of the third homogenous section changed on account of limiting the project corridor up to UP/Bihar border and addition of new Gorakhpur bypass, the baselines and targets were adjusted on a pro-rata basis to make the final achievements comparable. For the convenience of the ICR reader, all the relevant data is tabulated and placed in Annex 10.

- *Safer-Greener Pilot Highway Pilot*: (i) Ex-post stakeholder satisfaction survey shows significant increase in satisfaction; and (ii) Fatal accidents reduced on pilot corridor;
- *Fiduciary Controls*: (i) No overdue actions on audit reports except for policies outside NHAI domain; (ii) Accounts error-free; and (iii) Enterprise-wide Resource Planning (ERP) operational in NHAI.
- *Strengthen Road Safety Cell* to enhance safety of designs, construction practices and network operations including empowerment to enforce safety aspects: Reduction in fatal accidents on project corridor sites and completed project corridor, with no baseline or separate targets.

8. ***Second Restructuring:*** In mid-June 2012, just before the loan closing, the project was restructured again but with no changes to PDO. The restructuring essentially gave effect to cancellation of two poorly performing components – *Safer-Greener Highway Pilot* and *Implementation of a new ERP system* – and reallocation of the funds budgeted for them (USD 20mn) to the *Highway Upgrading* component.

1.4 Main Beneficiaries

9. The main beneficiaries of the project are the users of the road corridor from Lucknow to Muzaffarpur (Lucknow-Uttar Pradesh/Bihar border, as per the revised PDO), which passes through some of the poorest districts of UP and forms part of the national trunk road linking the remote, less developed north-eastern states of India. In addition to providing direct primary benefits of reduced travel times and costs to the corridor users (of whom about 65 percent are commercial), the investment operation was expected to have significant secondary effects on poverty alleviation and the socio-economic well-being of the population in the adjoining rural areas.

1.5 Original Components (*as approved*)

10. ***Highway Upgrading (USD 802.87 million, including contingencies):*** This component was aimed at removing the capacity constraints on the NH network by providing for the upgrading to 4-lane divided carriageway standard of 483 km out of the total 513 km continuous stretch of NH 28 between Lucknow and Muzaffarpur. The Lucknow to Muzaffarpur stretch of the EW corridor was envisaged to be divided into five homogenous sections: (i) Lucknow-Ayodhya (126 km); (ii) Ayodhya-Gorakhpur (117 km); (iii) Gorakhpur-Gopalganj (106 km); (iv) Gopalganj-Muzaffarpur (134 km), and (v) Gorakhpur Bypass (30 km). For road sections (i) to (iv) inclusive, the project was to finance:

- upgrading of the 483 km section of the NH-28 highway to a four lane standard and associated environmental management actions procured in twelve packages through International Competitive Bidding (Activity cost: USD 709.28 mn);
- construction supervision by four teams of internationally recruited consultants (USD 24.36 mn);
- delivery of entitlements under a Resettlement Action Plan to project affected people; and

- ancillary activities such as afforestation, cement concrete pavements performance study and monitoring and evaluation activities as well as road safety and HIV/AIDS awareness programs.[6]

11. It was decided that the construction of the Gorakhpur Bypass would be financed by the NHAI itself, since it was a Greenfield project and was considered to be different from the remaining four sections in terms of (higher) unit costs, implementation timeframe and options for financing. However, considering that this Bypass was to form an integral part of the Lucknow-Muzaffarpur corridor, it was agreed that the preparation and implementation of environmental and social safeguard management of this link would be identical to that of the Bank-financed sections.

1.6 Revised Components

12. The project components were revised twice, in line with the project restructuring carried out respectively in May 2010 and June 2012.

13. ***First Revision:*** As part of the restructuring approved in May 2010, the loan closing date was extended by two years, to June 2012, and the scope of project design was expanded to include three new activities as detailed below:

i. *Highway Upgrading (USD 785.39mn):* Following the removal of all activities that were covered under the four poorly performing contracts, the scope of this component was reduced by about 32%, that is, the length of the highway to be converted to 4-lane dual carriageway standard under the project was reduced from the original 483 km to 328 km (from Lucknow up to the UP-Bihar border).
ii. *The Safer-Greener Highways Pilot (USD 26mn) to* retrofit 55 km of the existing six-lane Delhi-Panipat section of NH-1, the country's most heavily trafficked highway, with enhanced safety and environmental measures as a pilot for a broader program to improve the safety and user friendliness of the NH network.
iii. *Strengthening the Road Safety Cell (USD 2.75mn)* to enhance safety of designs, construction practices and network operations including empowerment to enforce safety aspects.
iv. *Implementation of a new Enterprise Resource Planning (ERP) system (USD 34mn):* This activity was expected to strengthen fiduciary controls through enhanced management systems and accounting based on business principles.

14. ***Second Revision:*** In the second restructuring carried out in June 2012, the *Safer-Greener Highways Pilot* and the *Implementation of a new ERP system* were removed as their procurement itself witnessed significant delays.

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[6] The breakup of budgeted costs of various activities: (i) Land Acquisition, R&R implementation, additional environmental enhancements not related to the road itself and utility relocation (USD 60.03 mn); (ii) awareness campaigns for road safety and HIV/AIDS (USD 0.50mn); (iii) services to support improvement to the NHAI management information system including on cement concrete pavements performance, road users' satisfaction survey at the end of the project and RAP impact assessment (USD 0.75mn); and (vi) NHAI incremental operating costs (USD 7.95mn) to be financed by NHAI.

1.7 Other significant changes

15. Some of the other notable changes in the project design in the wake of the May 2010 restructuring are detailed below.

16. ***NHAI TA Project:*** At the behest of GoI, the Bank prepared a separate Technical Assistance (TA) project with NHAI to support the latter in undertaking various institutional reforms including addressing critical recommendations of the inter-ministerial committee report on strengthening NHAI. The USD 45 million TA (loan) project – covering a wide range of areas including contract management, governance, safety, design quality, performance monitoring of contractors/concessionaires and consultants, and new contracting approaches - was approved in November 2010.

17. *Governance and Accountability Action Plan:* The restructuring also brought the project under the purview of the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, 2006", and accordingly, a Governance and Accountability Action Plan (GAAP) was prepared in agreement with NHAI and GoI and included in the project design.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

(including whether lessons of earlier operations were taken into account, risks and their mitigations identified, and adequacy of participatory processes, as applicable)

18. ***Soundness of the background analysis:*** The situation analysis conducted at the time of appraisal rightly highlighted the merit in supporting NHDP as it was a program of strategic significance from the transport sector perspective and also widely regarded as one of the foundations for the country's economic growth. Even during the CAS period at the completion of the project, NHDP continues to be an important strategic priority for the government as well as the sector.

19. The PDO of improvement of civil works (over a 483 km corridor) and the focus of the chosen indicators on improving road services - through reduction in travel time, vehicle operating costs and accidents – was broadly in line with the Bank's previous engagements in support of NHDP. The corridor itself, being a part of the East-West Corridor of the NHDP, is an important link for improving connectivity for the lagging states of Uttar Pradesh and Bihar and the North-Eastern Region of the country.

20. A notable shortcoming in the PDO, however, is the lack of attention to any institutional challenges involved in effective implementation of NHDP. To be fair, the appraisal team recognized the importance of these challenges but took a view that: (i) these challenges were being addressed through the ongoing and planned technical assistance under the three previous Bank-financed projects; and (ii) NHAI is already managing a large number of technical assistance activities funded by both the Bank and other multilaterals. The ongoing and planned technical assistance with the Bank's assistance, however, was limited to areas such as road information system, corridor management pilots, corporate plan and human resource management. To that extent, it was either insufficient or had long gestation period to have direct, meaningful bearing on NHAI's abilities to address the most proximate challenges in implementing LMNHP,

viz., inadequate field level staffing with little or no empowerment, paucity of resources and procedures to ensure effective review of designs.[7] As it turned out, even these TA activities were either dropped or substantially pruned during implementation of the respective projects.

21. ***Assessment of the Project Design:*** The project design with a single component of *Highway Upgrading* appears to be adequate for the given PDO. Within this component, the project design had drawn upon several lessons from earlier operations especially w.r.t. procurement, social and environmental aspects, viz., (i) rationalization of contract package sizes to increase competition and diversify the risk of poor contractor performance and difficult site conditions in the states of UP and Bihar; (ii) stricter pre-qualification criteria for contractors, especially for screening Joint Ventures (JVs); (iii) efforts for early mobilization of supervision consultants; (iv) utilization of Non-Government Organizations (NGOs) for Resettlement Action Plan (RAP) implementation; and (v) stronger integration of HIV/AIDS concerns with exclusive budget and timelines. It also envisaged some support for: (i) cement concrete pavement performance study; (ii) road safety awareness campaigns; and (iii) studies for user satisfaction and Resettlement and Rehabilitation (R&R) impact assessment.

22. The project design sought to follow the BoQ mode through public funding – which, reportedly, was the preference of NHAI – with no apparent attempt to explore or analyze alternative contracting approaches. For example, at the time of appraisal, the then emerging trend of private participation in NHDP was noted but only from the narrow lens of public-vs.-private financing. Such a view was apparently influenced by the Bank's Operations Evaluation Department (OED) sector review (2001), which concluded that the Bank should focus on highways, especially the interstate system, and that while efforts should be made to encourage private funding, a substantial public funding program was justified. Yet, the project could have benefited with a better recognition of the significance of the private participation trend, i.e., its potential for harnessing investment and operational efficiencies through clubbing of construction and maintenance responsibilities over a long time period and for mobilization of additional funds through user charges.

23. ***Adequacy of Government Commitment:*** Both GoI and NHAI exhibited adequate commitment throughout the preparation stage. Following the Bank guidelines, the implementing agency had put in place the safeguard management plans with participatory processes and suggested institutional arrangements at the field and headquarter (HQ) levels.

24. ***Assessment of Risks:*** The task team identified nine risks to achievement of the PDO (three risks) and outputs (six risks). Two other important risks – related to sustainability of project assets through ex-post maintenance and inadequate staffing – were rated "modest" based on the expectation of actions anticipated from the ongoing

[7] For instance, the ICRs of both GTRIP and TNHP highlighted that (i) the implementation framework did not give sufficient attention to monitoring the staffing and training needs of NHAI to fulfill its mandate; and (ii) the two-year timeline in the PAD's action plan for NHAI's transformation was unrealistic.

technical assistance activities under the preceding projects. The subsequent developments during the implementation suggest that: (i) the risks pertaining to tree cutting, utility shifting, unsatisfactory contractor performance, construction delays, quality problems, law & order etc. were correctly reflected as "Substantial"; and (ii) the risks related to engineering designs/estimates and inadequate cooperation from the state governments in expediting land acquisition were not recognized.

2.2 Implementation

(including any project changes/restructuring, mid-term review, Project at Risk status, and actions taken, as applicable)

25. The project implementation period could be broadly divided into three phases, viz. (i) the initial 3-4 year period of substantial delays; (ii) 1-2 year time taken to address these challenges through restructuring; and (iii) the remaining 2-3 year period wherein the (reduced) length of project corridor was made operational.

First (problematic) phase

26. ***Problems and challenges in project implementation:*** In the initial 3-4 years of implementation, several problems and challenges faced by the project – and their underlying causes – are summarized below:

- ***Delay in Procurement of Civil Works:*** The first round of bids received in December 2004 for the 12 civil works contracts turned out to be 45-90% more than the original estimates and, hence, NHAI decided to opt for rebidding them.[8] The project lost nearly one year before all the packages were awarded through the second round of bidding;
- ***Poor Design Surveys and Estimates*** for all the 12 packages resulted in quantity and cost variations. For instance, prior to the second round of bidding, the estimates for various packages were revised up to 20% because the original estimates were found to have been based on obsolete Schedule(s) of Rates;
- ***Prolonged delays in pre-construction activities:*** Land Acquisition, tree cutting and utility relocation continued to be delayed well up to 2009. This, in turn, had a cascading effect in terms of delays in handing over the encumbrance-free land to the contractors and thus can be termed as one of the principal causes for the subsequent time and cost overruns. These activities essentially come under the purview of the respective state governments and the delays were mainly attributable to the lack of adequate cooperation from the state governments, particularly in Uttar Pradesh where the state government's condition to provide additional land for afforestation took considerable time to get resolved;
- ***Delays in implementation of civil works and weak contract management by NHAI:*** Poor performance of contractors (particularly in the four contract

[8] The procurement strategy was reportedly modified to enhance competition in the 2nd round of bidding, through following measures: (i) pre-qualification was replaced with post-qualification; (ii) bids were invited in 3 separate batches, four at a time; and (iii) qualification criteria were marginally relaxed.

packages that were eventually removed from the project) and supervision consultants, which was caused or accentuated by the weak contract management as reflected in delayed and inconsistent decision making and general reluctance on the part of NHAI to make use of remedies available under the contracts such as management meetings, arbitration and application of liquidated damages.[9] Lack of delegation of powers to the field levels resulted in centralized and slow decision making in case of variations and time-extensions, resulting in more disputes.[10] Another major problem noted was the confusion caused by some of the internal orders of NHAI, which were not consistent with the FIDIC-based contracts funded by the Bank. These factors together contributed to delays and (sometimes prolonged) disputes; and

- Inadequate staffing of contractors, supervision consultants and NHAI.

27. ***Rapid growth of NHDP:*** During the course of LMNHP preparation and implementation, the pace and nature of NHAI's activities witnessed several major changes. To begin with, the scope of NHDP – for the most part of which, NHAI was responsible - expanded manifold to cover a total of about 48,000 km of National Highways through seven phases. Concomitantly, the road length of contracts awarded by NHAI increased from 342 km in 2003-04, to 1,305 km (2004-05) and 4,740 km (2005-06). In the subsequent three years leading up to 2008-09, the length of km awarded progressively dipped to 643 km, but NHAI had to deal with a substantial shift in the mode of contracting towards PPP. In years 2009-10 and 2010-11, the pace of awards accelerated again to reach up to 3,000-4,000 km per year. These changes, coupled with limited or no infusion of additional staff, seem to have extensively impaired NHAI's ability to devote requisite level of attention and staff resources for LMNHP.

28. ***Mid-Term Review:*** The Mid-Term Review (MTR) in the first half of the calendar year 2008, amply highlighted almost all the implementation problems mentioned above, viz., the delays in pre-construction activities, poor performance of contractors and inadequate resource mobilization by the contractors and consultants.

29. ***QALP Review:*** In the second half of the calendar year 2008, an independent Quality of Lending Program Assessment (QALP-1) Review further highlighted the problems noted in the Mid-Term Review and rated the likelihood of achieving PDOs as "Moderately Likely". Some of the other important observations and ratings of the Panel were:

- The simple design of the project is also its weakness. Implementation of this project as well as achievement of the broader DO of the NHDP depend critically

[9] For instance, NHAI had sought to address the problem of five "non-performing" contracts (packages 5, 9, 10, 11 and 12) through signing Supplementary Agreements that set stiff but achievable monthly targets over the subsequent four months and stipulated termination as the only remedy for failure to achieve the set targets in any month. Although all the five contracts failed to achieve the targets in different months, NHAI terminated only package 9 (in February 2009).

[10] In the last couple of years of the project, an additional layer of Regional Office headed by a CGM was introduced but without much delegation of financial powers. This increased the level of scrutiny but the decision-making was still centralized and at the HQ in Delhi.

on institutional changes in the implementing agency that are beyond the specific scope of the components of this project. This was not understood by the Bank in design, as it took on trust the relative integrity of the work-processes of NHAI and under-estimated the institutional risk (the quality of the design overall is considered *Moderately Unsatisfactory*).

- Implementation issues could have been managed if NHAI had performed better, but NHAI supervision of works and follow-up on problems were deficient; engineering staff were too thinly spread over the length of the project road. Given the delays in progress at the MTR, it would have been prudent to reassess the implementation schedule for the project (the quality of implementation overall is considered *Moderately Unsatisfactory*).
- The task team addressed all of the implementation issues, although without effective timely resolution on the part of counterparts. The task team has consistently over-rated the project in the Implementation Status and Results Reports (ISRs) while correctly describing the issues in the supporting text. Supervision was constrained by the relatively limited leverage provided by a loan of a few hundred million dollars under this project in the context of the overall financing needs of the transport sector and the national highway network. Within these constraints, the Bank team laboured patiently, returning to the same issues time after time, and helping NHAI to improve (the quality of Bank supervision was rated *Moderately Unsatisfactory*).

Second (restructuring) phase

30. ***First Restructuring:*** In December 2008, the task team prepared (and agreed with GoI and NHAI on) an Action Plan to mitigate various risks and weaknesses in the implementation of LMNHP. However, as there was no improvement in the situation, the project was eventually restructured but the process took almost two years. A positive development in the context of restructuring was an agreement between the Bank and GoI/NHAI to structure a separate TA loan to address some of the institutional challenges that may fall beyond the time limit of the LMNHP.[11] Following the restructuring in 2010, the teams could again focus their efforts more squarely on the day-to-day implementation issues and eventually completed the balance works – ranging from 4% (in package 2) to 49% (in package 5) - in the eight remaining packages within the next two years.

Third (post-restructuring) phase

31. ***Increased attention to the issue of Worksite Safety:*** Yet another positive development during implementation was the increased attention to safety during construction, which, in fact, was prompted by the occurrence of a couple of accidents at worksites in 2008. The project used these 'adversities' to create 'opportunities' by moving the project level requirements for mitigation of safety risk higher up on the agenda of the highway agencies like NHAI. With the Bank's perseverance, occupational health and safety (OHS) issues got the much required attention as a sector level issue and

[11] *Restructuring Paper: Lucknow-Muzaffarpur National Highway Project*, The World Bank, March 2010 (Annex 11).

several steps/actions were taken through the project to move this agenda forward, viz., (i) stationing of safety officers at project worksites; (ii) conducting of worksite safety audits (the Terms of Reference prepared by the Bank for this task is now being used/referred in other projects); (iii) monthly review, rating and reporting of worksite safety status of each works contract; (iv) specific attention to OHS issues in the ToRs that NHAI prepared for PPP projects and; (v) preparation of a manual on worksite safety management for use in all NHAI projects.

32. ***Integrity Vice Presidency (INT) Investigations/Review:*** In 2009, INT received a complaint regarding potential failures in construction work undertaken in the project. INT reviewed procurement, implementation, management and supervision arrangements as well as inspected companies identified as the poorest performers and conducted forensic audits on their operations. In the course of its work, INT identified significant evidence of potential sanctionable practices by certain construction contractors as well as by supervision consultants.

33. ***Quality of construction:*** The Annual Independent Review (AIR) carried out in 2011 noted numerous instances of poor workmanship, defects and poor design but observed that the quality of construction was in conformance with the technical specifications and was generally satisfactory. The Implementation Completion and Results Report (ICR) mission just before the closure of the project made similar observations and the same were mostly corroborated in the interactive sessions with the stakeholders.[12]

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

34. ***M&E Design:*** The project envisaged to monitor the achievement of PDO through measuring the benefits to the users of the project corridor in terms of reductions in vehicle travel time, truck operating costs and number of fatal road accidents and the user satisfaction in the region, in year 3 (mid-term) and year 5 (end of project). In addition, impacts of resettlement were envisaged to be determined through a separate assessment of RAP. The progress on the *Highway Upgrading component* was also sought to be measured through:

- average cost and time overruns (for civil works contracts, throughout the implementation period, using the existing Management Information System of NHAI);
- survival rate of afforested trees (in year 5, at the end of project); and
- ex-post EIRRs (at the end of project).

35. At the time of restructuring, the scope of the indicators related to fatal accidents on the project corridor was expanded to include even the construction-related accidents. Also, the indicator for road user satisfaction (with the NHAI projects in the region) was dropped on the grounds that its scope goes far beyond the investments supported under

[12] *Annual Independent Review: Lucknow-Muzaffarpur National Highway Project*, Final Report April 2011, Leo Rothenburg, P.Eng, Janusz Sobieniak, P.Eng.

the project. While this may be so, the project should have at least limited the study to assess the road users' satisfaction with respect to the project stretches.

36. In terms of M&E design, *prima facie*, the aforementioned indicators and measures appeared to be sufficient given the focus of the PDO/project design on improvement of the project corridor but deficient to measure the significant secondary effects envisaged with regard to poverty alleviation and the socio-economic well-being of the population in the adjoining rural areas. Also, the basis for choosing particular levels of targets is not clear. In retrospect, the target of 10% reduction in fatal accidents appeared to be challenging, especially against the backdrop of rapid increase in vehicle population as well as concentrated development along National Highway network, both of which considerably enhanced the risk/incidence of accidents.[13] In addition, the indicators were sought to be monitored only through a survey at the end of the project, with no intermediate checks that could have triggered necessary course corrections.

37. ***M&E Implementation and Utilization:*** On the NHAI side, the project was monitored through four Project Implementing Units (PIUs) (each managing about three contracts) at the field level and two General Managers, respectively responsible for the states of Bihar and UP. The PIUs, however, were mostly understaffed; either they did not have sufficient staff allocation or the staff assigned (mostly Project Directors) were burdened with the additional charge of various other projects.

38. The Bank, on the other hand, relied on supervision/monitoring procedure of half-yearly missions and field visits, comprising members from various specializations. These missions were followed by field and HQ level wrap-up/debriefing meetings with NHAI, MoRTH and the Department of Economic Affairs (DEA), and aide memoires and management letters. During the more problematic periods – that is, during and post-restructuring – the task team undertook more frequent/intensive missions and also relied on Annual Independent Reviews (AIRs). The project was also monitored through regular reviews by the Sector as well as Country Management, including through ISRs and tripartite review meetings with the implementing agency & Ministry (of Road Transport and Highways) and the DEA. In addition, the project received further scrutiny through the Mid-Term Review (though delayed by one year) and QALP Panel Review.

2.4 Safeguard and Fiduciary Compliance

(focusing on issues and resolution, as applicable)

2.4.1 Social and Environmental Safeguards

39. *Social Aspects, Land Acquisition (LA) and Resettlement & Rehabilitation (R&R):* Social, displacement and resettlement impacts of the project were high in magnitude as well as intensity, viz., (i) an acquisition of 442 ha of private land from about 14,976 titleholders and 8,418 non- titleholders; and (ii) 259 religious properties. In terms of ISR ratings, the journey of R&R implementation in the project was a mixed experience with frequent changes in the level of compliance, ranging from *satisfactory* to *unsatisfactory*

[13] According to the data compiled by MoRTH, during 2007-2010, the number of accidents and fatalities increased at annual compounded growth rate of 2.6% and 6.1% respectively.

and back again to *satisfactory*. By the project closing date, the land acquisition and resettlement implementation was fully completed and all affected families received their compensation and main entitlements, except a few whose cases were in court on ownership disputes.[14] Periodic reviews and orientation workshops, regular community consultations, continuous interactions with state officials and confidence building measures with local leaders and communities, have all gone a long way in turning around the LA & R&R implementation. The project also made a notable contribution to HIV/AIDS control, which was detailed under Section 3.5 on *Overarching Themes, Other Outcomes and Impacts*. However, the consultants for evaluating the end of project R&R results were not hired until the closing date. Some of the corridor sections not financed by the Bank but still under construction will continue to be monitored by the Bank until their logical completion as per the provisions of Project R&R policy and Project Agreement.

40. *Environmental Management and Safeguards:* Environmental compliance in the initial years of LMNHP remained patchy and varied across the contract packages, despite the fact that NHAI had some level of awareness, understanding and capacity to deal with environmental issues from the execution of three previous Bank funded projects. Here too, as reflected in the ratings, the compliance moved from *satisfactory* to *unsatisfactory* before turning around to *satisfactory*.[15] Training workshops, regular reviews, interim missions, consultations with the communities and continuous interactions with state administration, helped in bringing substantial improvements. In particular, capacity building efforts covering the staff of contractors, consultants and PIUs, contributed to creation of a group of 20+ environment professionals who are now well versed and have practical experience in dealing with environment, health and safety issues during highway construction; this contribution is particularly significant in light of a severe deficit of such skills in the market.

41. Some of the features that contributed to effective management of various environmental issues are detailed below:

- Development and implementation of environmental management practices through a systematic process for approval, monitoring and documentation – demonstrating a good practice not only for the project but for the highway sector as a whole;

[14] Finally, land stretches totaling up to 1,800 mts (480 mts on right hand side and 1,320 mts on left hand side) were taken out from the project scope due to long delays in resolving complex ownership issues. NHAI proposed to take up these works with its own funds under maintenance contracts. Similarly, about four religious properties were not able to be relocated due to hard stands taken up by the religious leaders.

[15] The Bank will continue to monitor a few activities that are still ongoing in the project. These include: clean-up and rehabilitation works in a few small sections/camps; compliance to drainage related issues (contracts 1 to 3) raised by the Bank's supervision missions; and completion and rectification of drainage, slope protection and debris clearance issues in Gorakhpur bypass (not funded by Bank but being monitored as this is a 'linked project'). In addition, periodic review will be undertaken for contracts 9 to 12 (not part of LMNHP any more) in line with Bank policies and project restructuring agreement until the sub-projects are completed.

- Proper rehabilitation of all borrow areas, mostly as farmlands and some as ponds (for irrigation or fish culture), contributing significantly to the income of the concerned households;
- Proper camp and plant site management, first aid and emergency response arrangements, relocation and enhancement of religious properties (259 in number, including resolution of issues in sensitive cases), appropriate debris management (including its re-use for productive purposes) and worksite clean-up/rehabilitation activities (in most sections);
- Median and avenue plantation mostly completed along with the civil work cycle, with an over-all good survival rate;
- Introduction of an audit system for improving environment compliance and worksite safety management (including occupational health and safety aspects) which helped in initiating activities to strengthen the said areas at the sectoral level;
- Practices like vermi-composting and management of BOD in the wastewater from camps (by using a particular plant species) remain unique in the context of linear infrastructure projects in the region.

42. Some of the other important features of the project with respect to social aspects and a few suggestions for process improvements pertaining to social and environmental management are placed in Annex 8.

2.4.2 Fiduciary Compliance

43. ***Financial Management:*** The Financial Management performance of the project during the initial half of the project duration was sometimes unsatisfactory but improved in the last two years of the project implementation to close at a *moderately satisfactory* rating. The SOE audit reports were generally timely and unqualified. The timeliness of submission of the Entity Audit Report also improved. The NHAI entity audit report continued to have Qualified Exceptions throughout the audit period. There were consistent improvements in the internal audit function with critical action reports being issued and reviewed by the Internal Audit Committee and thereafter by the Board Level Audit Committee. Despite the systemic improvements, the Bank noted that there was still a significant reputational risk given the nature and quality of audit comments (both by the internal and statutory auditor).

44. ***Procurement:*** Procurement of works, goods and services was carried out in accordance with Bank guidelines. The bidding/selection process was conducted in a fair and transparent manner. Procurement arrangements were well defined, contract packaging was straightforward and no significant problem was encountered during both the initial and re-bidding rounds of procurement of works. Based on the experience from this project, the practice of Pre-qualification (PQ) has been made optional for (relatively less-complex and standard) Road Sector contracts in India.

45. However, major challenges were faced in selection of consultants and procurement of IT systems, and during the implementation of civil works (which were detailed earlier in para 26). Accordingly, the performance of procurement function was rated *satisfactory* in the initial stages but downgraded to *moderately satisfactory* ratings in the later stages until closing.

46. *Governance and Accountability Action Plan (GAAP):* NHAI was initially reluctant to acknowledge the weaknesses related to its governance but subsequently made efforts to implement GAAP and achieved notable progress in the following areas: (i) dissemination of pertinent project related information;[16] (ii) enabling of online status of e-payments to contractors; (iii) facility for the public to post complaints about any aspect of any road on the NHAI website; (iv) an incentive scheme for whistleblowers; (v) selection of consultants (CRRI) to carry out third party quality audits; and (vi) constitution of an independent expert group to look into pending disputes. Some of the actions envisaged under the GAAP such as ERP system, performance evaluation and rating system for contractors and corporate governance assessment of NHAI were not achieved during the project period but are expected to be implemented as part of the separate TA loan to NHAI.

2.5 Post-completion Operation/Next Phase

(including transition arrangement to post-completion operation of investments financed by present operation, Operation & Maintenance arrangements, sustaining reforms and institutional capacity, and next phase/follow-up operation, if applicable)

47. *Civil Works and Operation and Maintenance (O&M):* As regards Operation & Maintenance of the project-financed roads, the ICR mission was informed that NHAI had already invited bids for 2-year O&M contracts and is planning to subsequently award them as longer term Operate, Maintain and Toll (OMT) concessions. NHAI is also working on the completion of the remaining minor works of restructured LMNHP and that of the contract packages 9 and 10 to agreed standards of environment and social norms of the Bank.

48. *Institutional Aspects:* From the viewpoint of sustaining broader reforms and institutional capacity, the NHAI TA project put in place in the wake of the first 'corrective restructuring' in May 2010 assumes critical importance. The preparation for this TA rightly recognized that the then poor performance of the four contracts under the LMNHP is symptomatic of a need for deep enhancement of the institutional capacity and effectiveness of NHAI, which is also critical for better managing its mandate of national highway development. Accordingly, the TA was aimed at assisting NHAI in addressing two key strategic challenges/concerns – (i) '**Managing the Present**' i.e. its structure, people, processes, systems which influence *inter alia* governance, accountability systems; asset management and safety; and (ii) '**Preparing for the Future**', i.e., addressing emerging demands enabling a manifold increase in output, and changing its role from a builder to an asset manager. The TA thus provides a substantial opportunity for the NHAI and the Bank to address the institutional strengthening agenda that was un-attempted/unfinished in the earlier engagements.

3. Assessment of Outcomes

[16] These included, for example, restructured project paper, quality audit reports and monthly progress reports on the status of all NHAI projects including LMNHP (with start and completion dates, time overruns and cumulative physical and financial progress till date), and details of land acquisition (including total area to be acquired and actual land in possession of NHAI to begin construction in each state).

49. The original PDO was revised through restructuring approved in May 2010, and by that time, about 75% of the project amount was already disbursed. Keeping this in view, first, separate ratings have been assigned to the original and revised PDOs/Outcomes and then, they were combined to derive the overall weighted-rating of the outcome (based on the percentage of loan amount disbursed prior to and after revision of PDO).

3.1 Outcome rating w.r.t. Original PDO, i.e., up to May 2010

(Moderately Unsatisfactory)

50. ***Relevance of Objective, Design & Implementation:*** The PDO of benefiting road users from an improved journey between Lucknow-Muzaffarpur is broadly in line with the Bank's Country Strategy during the appraisal as well as at the closure of the project. The Bank's Country Strategy at the time of appraisal highlighted the importance of engagement in transport in order to not only support India's growth agenda but also contribute to the empowerment of the poor and vulnerable groups by helping improving access to markets, jobs and services[17]. In particular, the strategy underscored the need for providing investment support to the development of critical links of NHDP as well as extending assistance to further the sector reform agenda. Similarly, the Country Strategy for 2009-12 – the period during which the project came to close – also envisaged increasing the level and quality of infrastructure services including National Highways, as critical for removing structural constraints to growth.[18] In line with these strategies, the selected 483 km project corridor – an important segment of the East-West Corridor of NHDP – was and is critical for improving the connectivity and access for some of the poor districts in the lagging states of Uttar Pradesh and Bihar and for the North-Eastern Region of the country.

51. However, the PDO's singular focus on civil works also happens to be its shortcoming. At the time of the project appraisal, effective implementation of NHDP was the foremost development priority in the sector as well as for the client government. Managing effective implementation of a large program like NHDP and negotiating a massive shift towards BOT concessions would have entailed a variety of institutional challenges, e.g., augmentation of skill sets, improvement/re-orientation of NHAI's systems and processes across various functional areas, etc. Yet, none of these challenges and trends found a place in LMNHP's PDO or project design, thereby diminishing the project's relevance in addressing proximate sector priorities and challenges. In terms of preparation and implementation, (i) the overall cost overruns were partly attributable to the poor quality of initial estimates; and (ii) the measures for mitigating the pre-identified risks related to delays in pre-construction activities turned out to be less than effective. Considering these as significant limitations, the relevance of objectives, design and implementation is rated as *moderately unsatisfactory*.

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[17] Country Strategy for India, The World Bank Group, September 2004.

[18] Country Strategy for the Republic of India for the period FY 2009-12, The World Bank Group, November 2008.

52. ***Achievement of PDO and Efficiency:*** By the time of restructuring, the original PDO of improvements in Lucknow-Muzaffarpur corridor was not achieved as the work on none of the 12 contract packages was fully completed (see Table 1 below). For example, except in case of packages 1, 2, 3 and 6, the progress was below three-fourth of the original contract price. Although data on the key outcome indicators – namely, reduction in travel time, costs and fatal accidents – was not available by the time revision of PDO, the substantial shortfall in progress suggests that the targets for these indicators might not have been achieved. In addition, the sizeable differences between the percentage of progress vis-à-vis original contract price and anticipated completion cost, summarized in Table 1 below, suggest that all the packages were also facing cost overruns. In view of this, the achievement of PDO as well as efficiency were rated as *moderately unsatisfactory*.

Table 1: LMNHP: Package-wise Progress By the time of Restructuring in March 2010

Contract Package	1	2	3	4	5	6	7	8	9	10	11	12
Progress (%)*	85	96	89	77	51	86	63	66	18	38	41	48
Progress (%)**	71	79	70	72	46	81	63	66	18	36	45	48

*% of original contract price; ** % of anticipated completion cost
Source: LMNHP Restructuring Paper, March 31, 2010

53. ***Overall Outcome Rating of Original PDO:*** Considering the *moderately unsatisfactory* ratings for the relevance of objectives, design and implementation as well as the achievement of PDO and efficiency, the overall outcome vis-à-vis original PDOs was rated as *moderately unsatisfactory*.

3.2 Outcome rating w.r.t. Revised PDO

(Moderately Satisfactory)

54. ***Relevance of Objective, Design & Implementation:*** At the time of restructuring, the scope of PDO was revised to reflect the reduction in length of the Project Corridor (resulting from removal of four poorly performing contracts). To that extent, PDO continued to focus mainly on civil works with little or no reference to broader sector development priorities. However, within the legacy constraints of the project, an attempt was made to expand the scope of the project design to introduce three new activities to give fillip to critical issues of road safety and enterprise-wide improvement of NHAI's systems and processes (through ERP). More importantly, the GoI and the Bank have agreed to structure a separate TA loan to assist NHAI on several institutional challenges. Strictly speaking, broader institutional strengthening objectives of the TA loan were not a part of the revised PDO of LMNHP. Yet, it is important to recognize that the TA loan was: (i) organically linked and evolved from LMNHP, with clear reference in the restructuring document; (ii) structured as a separate loan mainly because its implementation required longer time beyond the revised closing date of LMNHP; and (iii) approved by the Board soon after the restructuring. Keeping this in view, relevance of revised objectives, design and implementation is rated as *moderately satisfactory*.

55. ***Achievement of PDO:*** By the end of the project in June 2012, the revised PDO – that is, "to improve the journey on NH-28 between Lucknow and the Uttar Pradesh/Bihar Border and to support NHAI in improving safety and sustainability of the project corridor" – was achieved or likely to be achieved but with a mixed record on some key aspects of performance, as detailed below.

56. *On the positive side,* the Lucknow-Uttar Pradesh/Bihar border (a total length of 358 km, including the 328 km comprising bank-financed stretches) has been upgraded to four-lane standard, with an IRI of less than 2.3. Travel time on the project corridor has reduced by 23% (for cars) and 25% (for trucks) – against an overall target of 20%. The road assets upgraded in the project corridor are likely to be sustained through requisite level of O&M, initially through two-year contracts, followed by OMT concessions. The project also made a notable contribution to moving the critical issues such as HIV/AIDS and road safety higher up on the NHAI/sector agenda. The compliance with respect to environmental and social safeguards has improved to "satisfactory" level by the end of project.

57. *On the other hand,* the project's performance with respect to key outcomes such as vehicle operating costs and number of fatal and non-fatal accidents has been, ***prima facie***, unsatisfactory or at least not-uniformly-satisfactory vis-à-vis targets across the three homogenous sections of the project corridor. For instance, the targets envisaged in the Project Appraisal Document (PAD)/restructuring paper for vehicle operating costs were achieved in case of cars in only two of the three sections, viz., Lucknow-Ayodhya and Ayodhya-Gorakhpur. In case of trucks, the targets for these costs were not achieved in any of the three sections; in fact, the VOC for trucks has increased in Ayodhya-Gorakhpur section. Interestingly, this result appeared to be inconsistent with the reduction in travel times, especially for trucks. A closer examination of the available data suggests that this inconsistency is perhaps attributable to the increase in speed for trucks from the baseline figures of around 39-42 kmph to end-of-project values of 48-58 kmph. In addition, in case of Ayodhya-Gorakhpur section, the baseline VOC for trucks at Rs.10.27 per km, appeared to be rather low in comparison to VOC of more than Rs.13 per km in all the remaining sections. In this section, average speed for trucks increased from 42 kmph to 58 kmph, which might have contributed to increase VOC. In view of this, the assessment of the project's achievement w.r.t. reduction in VOC may merit some leniency.

58. In case of fatal and non-fatal accidents, too, the target envisaged was achieved only in two sections, viz., Lucknow-Ayodhya and Gorakhpur-Bihar border; Here, as explained in the section on M&E design, the project appears to have had set a rather challenging target for itself in this case. For instance, during 2007-10, the total number of accidents and the fatalities over the National Highway network increased at a CAGR of 2.6% and 6.1%, respectively.

Table 2: Accident Scenario in National Highways in India

Details	2007	2008	2009	2010	CAGR %
Total Accidents - NH	1,38,922	1,37,995	1,42,511	1,49,929	2.6%
No. of Persons Killed	40,612	42,670	45,222	48,466	6.1%
No. of Persons Injured	1,54,880	1,49,693	1,52,816	1,65,012	2.1%

Source: Road Accidents in India, Ministry of Road Transport and Highways (MORTH), GoI.

59. *On the negative side*, near doubling of both the fatal and non-fatal accidents in the Ayodhya-Gorakhpur section is particularly alarming and deserves further urgent investigation and remedial measures. Also, none of the three activities included at the time of restructuring – namely, support to Road Safety Cell, Safer-Greener Highway Pilot and ERP Implementation – made any notable progress until the closure of the project in June 2012. The only note of consolation here is that these activities are not fully abandoned. While NHAI is reportedly pursuing the Safer-Greener Highway Pilot through its own funds, the Bank will be supporting the *Road Safety Cell* and *Implementation of ERP* through the separate TA loan to NHAI (which is currently under implementation).

60. In view of the above shortcomings, the achievement of revised PDO was rated as *moderately satisfactory*.

61. ***Efficiency (Moderately Satisfactory):*** In all the eight packages, there have been sizeable time overruns (average time extension of 95%) and cost overruns (on weighted average basis, 128%, vis-à-vis original contract amounts).[19] Despite this, in the economic analysis carried out at the end of project, the three homogenous sections (of the revised, reduced length of the project corridor upgraded through eight contract packages) yielded EIRRs of 28% (Lucknow-Ayodhya), 29% (Ayodhya-Gorakhpur) and 18% (Gorakhpur-Bihar Border). The combined EIRR for the project corridor, at 26%, implies that the project even with the increased costs is economically justifiable (as against a threshold of 12%). Keeping this in view, the efficiency of achieving the revised PDO was rated as *moderately satisfactory*. For further details of the economic analysis, please see Annex 3.

62. **Overall Outcome Rating of Revised PDO:** Considering the *moderately satisfactory* ratings for the relevance of objectives, design and implementation, achievement of PDO and efficiency, the overall outcome vis-à-vis revised PDOs was rated as *moderately satisfactory*.

3.3 Weighted Average Rating of the Overall Outcome *(Moderately Unsatisfactory)*

63. The rating of outcomes related to the original and revised PDOs were combined using the "weighting system" recommended in the Bank's ICRR guidelines, that is, based on the percentages of loan amounts disbursed prior to and after revision of PDO (see Table 2 below). The overall outcome was thus rated as *moderately unsatisfactory*.

[19] The package wise details of time and cost overruns are provided in Annex 11. Here, it is noteworthy that these cost overruns may or may not be final because there are many outstanding disputes and claims by the contractors in all the contracts, which on an average work out to about 62% of the undisputed final cost of contract at closure. The Implementation Completion and Results Report (ICRR) team tried to compare this performance with other comparable projects but could not get any publicly available, reliable data for this purpose; such paucity of data is also indicative of the broader institutional challenges in the sector.

Table 2: Weighted Average Rating of the Overall Outcome

S.No.	Item Description	Against Original PDO	Against Revised PDO	Overall
1	Rating	Moderately Unsatisfactory	Moderately Satisfactory	-
2	Rating value	3	4	-
3	Weight (% disbursed before/after PDO change)	75%	25%	100%
4	Weighted value (2 x 3)	2.25	1.00	3.25
5	Final rating (rounded)	-	-	Moderately Unsatisfactory

3.5 Overarching Themes, Other Outcomes and Impacts

(if any, where not previously covered or to amplify discussion above)

(a) Poverty Impacts, Gender Aspects, and Social Development

64. *Capacity building and Mainstreaming Prevention and Control of HIV/AIDS program into NH agenda:* LMNHP is perhaps the first road sector project that purposively incorporated a program on prevention and control of HIV/AIDS in the project design with an exclusive budget and timelines. The goal was to reduce the risk of the spread of HIV/AIDS in the project area through raising awareness among people engaged in road construction; communities residing close to the highways; and of people using the highways. The HIV/AIDS program was mainstreamed into the NH agenda through capacity building and public awareness programs in the project corridor. NGOs engaged for this conducted several small and folk media events and also one-to-one and group interactions with outreach workers and peer educators. In addition, they displayed and disseminated Information, Education and Communication materials and referred several cases for: (i) treatment of sexually transmitted infections; (ii) HIV testing; and (iii) care & support services for people living with HIV. NHAI's field units were directly involved and made responsible in delivery of these awareness programs.

65. In partnership with ADB for capacity building within the NHAI, a cell was exclusively created for HIV/AIDS Prevention and Control. The cell was headed by a DGM with the support of subject specialists. It has undertaken a number of awareness programs for the staff and for the community and networked with National AIDS Control Organization (NACO) in delivering its mandate.

66. Although the project was expected to have significant secondary effects on poverty alleviation and the socio-economic well-being of the population in the adjoining rural areas, the same could not be conclusively ascertained; the M&E framework did not include any provisions for measuring such poverty and social impacts.

(b) Institutional Change/Strengthening

(particularly with reference to impacts on longer-term capacity and institutional development)

67. Only the restructured project contained some intervention aimed at institutional strengthening of NHAI, covering areas such as governance (GAAP), information systems (ERP) and safety aspects. Of these, some notable progress was achieved in selected elements of GAAP, and a Road Safety Cell was brought under the charge of a senior NHAI officer. Although the Cell initiated steps like issuing guidelines and carrying out audits, the momentum tapered down. The consultants and NGOs hired for the HIV/AIDS activity too have been demobilized after the closure of their respective contracts. Support to most of this unfinished institutional strengthening agenda is now being provided through the TA loan.

(c) Other Unintended Outcomes and Impacts (positive or negative)

68. No other appreciable unintended outcomes/impacts were noticed.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

(optional for Core ICRR, required for ILI, details in annexes)

69. Even though this was envisaged only as a core ICRR, the team conducted three half-day workshop/discussion sessions[20] to get a better understanding of the ground realities and perceptions among the various stakeholders. In general, the participants in these sessions were satisfied with the project preparation, implementation and benefits (in terms of reduced travel time and costs). They also highlighted a variety of concerns including inadequate treatment of drainage related issues, road safety, damage to the local roads caused by the trucks of Gorakhpur bypass contractors (hauling heavy construction materials) and settlement of roads mainly at approaches to bridges. A more detailed account of these and other issues, along with the list of participants, is placed in Annex 6.

4. Assessment of Risk to Development Outcome

(Rating: Significant)

70. The principal outcome of the project – that is, improvement of the project corridor – is likely to be sustained initially through 2-year O&M contracts, for which NHAI has sufficient funds and has already initiated the process of procurement. Thereafter, too, the project stretches are likely to be maintained through Operate, Maintain and Toll (OMT) concessions. The associated outcomes such as improved attention and capabilities to handle the social and environmental aspects and road safety, however, face the risk of being dissipated (or not being replicated) especially considering the experience from the previous three Bank-financed projects. The other institutional strengthening activities being pursued through a separate TA, which came in the wake of the project restructuring, are reportedly gaining some traction with NHAI but it is too early to make

[20] These were held at Lucknow, Ayodhya/Faizabad and Gorakhpur on August 7, 8 and 9, 2012.

an assessment of the progress likely to be achieved on this front. Accordingly, the risk to development outcome is rated as "Significant".

5. Assessment of Bank and Borrower Performance

(relating to design, implementation and outcome issues)

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry *(Moderately Unsatisfactory)*
(performance through lending phase)

71. During the project preparation, the Bank's support with respect to the civil works appears to be reasonable in terms of: (i) including lessons from previous operations; (ii) giving due attention to social and environmental aspects; and (iii) identification of risks. The preparation, too, was completed in a relatively short period of about two years. However, at the strategic level, the project design did not provide any room for addressing the larger sector development priorities or challenges, thereby diminishing the project's strategic relevance and approach. Given the Bank's mandate of development, due importance should have been accorded in the preparation stage to finding solutions and approaches that are sustainable and replicable. This aspect assumes particular significance considering that (i) LMNHP was the fourth lending operation in support of NHDP;[21] and (ii) by the time of preparation, the magnitude and challenges involved in implementation of NHDP would have been more apparent. In view of this, the Bank's performance in ensuring quality at entry is rated as *moderately unsatisfactory*.

(b) Quality of Supervision (including of fiduciary and safeguards policies)

72. Review of various project related documents (management letters, aide-memoires, ISRs, etc.) suggests that the Bank's supervision teams have been able to identify the implementation problems early on and candidly highlighted them to the Bank and NHAI management. Despite the fact that the project design hardly provided any leeway for a more robust and strategic engagement with NHAI and NHAI itself became increasingly busy with the rapidly growing NHDP, the supervision teams appear to have tried their best to: (i) keep the *Highway Upgrading component* moving, including through interactions and pursuance with other stakeholders such as state governments and communities; (ii) make an attempt to bring the institutional agenda to the fore, mainly through the structuring of a separate TA loan to NHAI; (iii) bring about some notable improvements in the management of environmental and social aspects, and progressively turn them around to satisfactory by the EOP; and (iv) take *road safety* higher up on the agenda in sector debates. Once the poor performance of contracts became acute in 2008, the Bank devoted substantially more staff weeks and expenditure to supervision – nearly two-thirds of the total resources for supervision over a span of eight years were expended in three years (FY09, FY10 and FY11, see Annex 4). The team also tried a variety of measures such as Third-party Quality Audit, Annual Independent Reviews, etc.

[21] A summary of the key ratings of ICRs for the three Bank-financed projects in support of NHDP are placed in Annex 13, for easy reference.

73. Despite the above efforts, the Bank's supervision has largely remained ineffective in getting NHAI to expeditiously resolve critical issues such as poor performance under four contract packages (prior to restructuring) and lack of progress in the three technical assistance activities added during the first restructuring. Owing to the delay in restructuring, a sizeable portion of the Bank loan as well as supervision efforts continued to be devoted to contracts that were ultimately cancelled and removed from the scope of the project; an earlier restructuring could have helped better utilization of these resources for the achievement of revised objectives. In view of this significant shortcoming, the Bank's performance during implementation was rated as *moderately unsatisfactory*.

(c) Justification of Rating for Overall Bank Performance

74. Considering that the Bank's performance has been *moderately unsatisfactory* during the entry as well as in implementation, the overall performance has been rated as *moderately unsatisfactory*.

5.2 Borrower Performance

(a) Government Performance

75. The government – that is, MoRTH and DEA – have extended reasonable level of support to the project during both preparation and implementation. Even at the time of restructuring, the government preferred that the Bank should continue to engage with the project and supported the new TA aimed at addressing broader institutional challenges of NHAI. This support at a broader level, however, did not transcend to ensuring effective cooperation from NHAI in addressing/expediting various operational level issues/actions. Accordingly, the Government's performance has been rated as *moderately satisfactory*.

(b) Implementing Agency or Agencies Performance

76. NHAI's commitment to LMNHP was evidently strongest during the period of preparation and until the award of civil works contracts. Building upon its previous three engagements with the Bank, NHAI worked towards higher level of preparedness by agreeing to early mobilization of NGOs and supervision consultants. In case of procurement, too, NHAI had made a strong case of rebidding to reject the uniformly high bids received in the first round and, thereafter, completed the rebidding process within one year.

77. In comparison, during implementation, although NHAI undertook and achieved a few notable actions/improvements with respect to social, environmental and safety issues, its involvement in management of civil works and institutional strengthening elements left a lot of scope for improvement. Most of the problems faced in project implementation can be traced back to a variety of factors under the control of NHAI, viz., inadequate staffing at PIUs and road safety cell, delayed decision-making, insufficient delegation of powers and weak contract management as reflected in the general reluctance to apply contractual remedies, delayed procurement for various consultancy services (e.g., road safety, safer-greener highway pilot and ERP). Keeping the above shortcomings in view, performance of NHAI was rated as *moderately unsatisfactory*.

(c) Justification of Rating for Overall Borrower Performance

78. Considering that the *moderately satisfactory* performance of the Government and the *moderately unsatisfactory* rating of the Implementing Agency, the overall Borrower performance has been rated as *moderately unsatisfactory*.

6. Lessons Learned and Suggestions

(both project specific and of wide general application)

79. ***Institutional Strengthening agenda should be accorded due attention, especially in projects aimed at supporting large programs such as NHDP.*** Projects such as LMNHP, being part of a larger program like NHDP, provide rare and unique opportunities to seed and demonstrate project and program level best practices. These can then be widely replicated across many projects within the national program and also serve as examples worthy of emulation by the states. Accordingly, the design of such projects should ideally have a robust and relevant institutional strengthening component.

80. ***Task teams should pay particular attention to the performance of large value contracts.*** In case such contracts turn problematic and continue to be intractable even after usual contractual remedies and/or beyond a reasonable timeframe – as happened with the four packages in LMNHP – the clients may be encouraged to consider the option of taking out such contracts, if necessary, through restructuring sooner than later. Significant delays here are likely to result in not only sub-optimal utilization of the loan amount but also more time spent by the teams and management on the Bank and client side.

81. ***Importance of contract design and contract management:*** The apparent poor performance of the contractors (and the consequent time and cost overruns) in LMNHP is mostly attributable to the contract design and weak contract management. For instance, the BoQ contracts offered little or no incentives to complete the projects within the agreed time and cost limits.[22] This was compounded by weak contract management in terms of: (i) delays in deciding on contractual issues like variations and extensions of time; and (ii) general reluctance to make use of available remedies such as management meetings, arbitration and application of liquidated damages.

82. ***Proactively engage relevant government departments:*** Activities such as LA, R&R and utility shifting, fall outside the purview of the implementing agency for civil works. The departments/agencies responsible for these activities, burdened with their routine workload, usually relegate the project related actions to a lower order of priority. In this regard, the approach followed in LMNHP – that is, engaging NGOs – appears to be useful as it helped partly alleviate the workload of the state revenue departments in expediting LA. In addition, it may be worthwhile to explicitly recognize such

[22] Even in these traditional BoQ contracts, one could consider explicitly requiring the contractors to mobilize their resources and equipment lock-in-step with progress of availability of encumbrance-free land for construction, thereby avoiding "idling" claims. Similarly, judicial and timely invocation of contractual remedies such as management meetings and imposition of liquidated damages could go a long way in checkmating the lackadaisical tendencies on the part of errant contractors.

departments as key implementing partners and enlist their support through a formal agreement on their respective roles and responsibilities during the project preparation and implementation.

83. A few more suggestions with respect to process improvements relating to social and environmental aspects are placed in Annex 8.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

A summary of the NHAI's ICR is enclosed in Annex 7. The draft ICR was shared with the Borrower and NHAI. In response, NHAI have suggested couple of amendments in the report to reflect the current status on certain aspects and the same have been duly incorporated in the report.

(b) Cofinanciers: Not Applicable

(c) Other partners and stakeholders *(e.g. NGOs/private sector/civil society)*: Not Applicable.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Category	Appraisal Estimate (USD millions)	Revised Estimate May 2010 (USD millions)	Revised Estimate June 2012 (USD millions)	Actual/Latest Estimate (USD millions)#	Percentage of Appraisal
Highway Upgrading	802.87	785.39	800.12	800.12	99.65%
Safer-Greener Highways Pilot (55 km)	-	26	-	-	-
Strengthening of RSC	-	2.75	2.75	2.75	-
ERP implementation	-	34	-	-	-
Front end fee	3.1	3.1	3.1	3.1	100%
Un-allocated	-	-		-	-
Total	805.97	851.24	805.97	805.97	100%

Based on information available in June 2012; Information on final amounts awaited from the borrower.

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Restructuring Estimate @ 2010	Restructuring Estimate @ 2012
Borrower		185.97	231.24	185.97
International Bank for Reconstruction and Development		620.00	620.00	620.0

Annex 2. Outcomes/Outputs by Component

The project had three components and the outputs of each are listed below:

Component/Activity Description	Key Performance Indicators	
	End of Project Target	**Achievement/Remarks**
1.1. Upgradation Road users to benefit from improved journey between Lucknow and Muzaffarpur. Revised to reduced length at the time of restructuring, that is, from Lucknow to UP/Bihar border.	Upgradation to 4-lane standard	The revised project corridor length was upgraded to 4-lane standard
	1 Reduction vehicle travel time (in mins) – Car & Truck.	**Achieved.** In case of Cars, the target of 20% reduction achieved in project corridor (23%) and in one of the homogenous sections, i.e., Gorakhpur-Bihar border (38%). In case of Trucks, the target of 20% reduction achieved in project corridor (25%) and also in all the three homogenous sections.
	2 Reduction vehicle operating costs (Rs./Km) – Car & Truck.	**Partially Achieved** In case of Cars, the target of 10% reduction achieved in project corridor (15%) and in two sections, viz., Lucknow-Ayodhya (14%) and Ayodhya-Gorakhpur (25%). In case of Trucks, the target of 10% reduction not achieved in project corridor (-4%) and in any of the sections. In Ayodhya-Gorakhpur, the VoC for truck increased by 27%.
	3 Reduction in number of fatal and non-fatal accidents	**Partially Achieved** In case of fatal accidents, the target of 10% reduction achieved in project corridor (36%) but not in Ayodhya-Gorakhpur section, where the no of fatal accidents increased by 95%. In case of non-fatal accidents, too, , the target of 10% reduction achieved in project corridor (28%) but not in Ayodhya-Gorakhpur section, where the no of non-fatal accidents increased by 88%.
	4. User satisfaction with National Highways in the region to be improved	This indicator has been dropped at the time of restructuring.
	5. Average cost and time overruns (no quantitative targets).	The indicator is deleted at the time of restructuring, but there has been a weighted average cost overrun of 128% and time overrun of 95% across eight packages. Package-wise details

Component/Activity Description	Key Performance Indicators	
	End of Project Target	**Achievement/Remarks**
		are given in Annex 11.
	6. Survival rate of afforested trees	Though no quantitative targets were provided for this indicator, at the end of the project, the survival rate of afforested trees in the eight packages varied from 50% (packages 2 & 5), 62% (package 3), 70% (in packages 1, 4 and 8) and 80% (in packages 6&7).
	7. Ex-post ERRs	This indicator has been dropped at the time of restructuring in May 2010. However, at the end of the project, the project corridor EIRR: 26%; Lucknow-Ayodhya Section - 28%; Ayodhya-Gorakhpur - 29% and Gorakhpur – UP./Bihar border: 18%
1.2. Safer-Greener Highway Pilot	1. Ex-post stakeholder satisfaction survey showing increase in satisfaction and reduced fatal accidents	Not achieved. Due to lack of progress, the activity has been dropped from the project during the last month of the revised closing date.
1.3. Fiduciary Controls	1. No overdue actions on audit reports: Unqualified Internal Audits except for policies outside NHAI domain	Internal Audit ToRs duly revised with a mechanism of review by board level audit committee.
	2. Error-free accounts: Unqualified SOE audit reports till FY 10-11	Achieved.
	3. ERP Operational in NHAI	Not Achieved. The activity has been deleted during the 2nd restructuring, just before the closing date.
1.4. Road Safety Cell	1. Fatal accident reduced on Project Corridor (i) worksites and (ii) per 100 lane-km	Road Safety Cell was partially strengthened. However, the activity has been dropped from the project during the last month of the revised closing date.

Annex 3. Economic and Financial Analysis

1.0 Economic Analysis at the time of Appraisal/Planning

1. At the time of planning/appraisal of LMNHP, economic analysis was carried out for 483 km (out of the total 513 km continuous Lucknow - Muzaffarpur stretch of NH28) of the proposed project corridor aimed at removing the capacity constraints through upgrading to 4-lane divided carriageway standard. The overall economic viability of the project section – based on estimated project costs and the expected reduction in vehicle operation cost and saving in travel time cost for passengers – was projected at 26% EIRR and an NPV of USD1,018 million (Rs.45,810 Million; discounted at 12%). See Table A2.1 below.

Table A2.1: Results of the Economic Feasibility (2002) of LMNHP at Planning Stage

Cases	EIRR %	NPV USD mn
Base Case	26	1,018
Costs increased by 15%	24	945
Benefits decreased by 15%	23	793
Costs increased by 15% and Benefits decreased by 15%	21	719
Opening delayed by one year	24	943

Source: World Bank Project Appraisal Document, LMNHP, November 2004

2.0 Economic Analysis on Completion of the Project

2. On completion of LMNHP in June 2012, economic analysis has been carried out for the 327 km of the project corridor upgraded through the project – from Lucknow to UP/Bihar border (excluding Gorakhpur bypass) – by dividing it into three homogenous sections, viz., (i) Lucknow-Ayodhya (130 km); (ii) Ayodhya-Gorakhpur (116 km); and (iii) Gorakhpur- UP/Bihar border (81.1 km), and using the Highway Development and Management Model (HDM-4). The details of homogeneous sections of LMNHP Roads in Uttar Pradesh State and their improvement proposals are presented in **Table A2.2**.

Table A2.2: Details of Homogeneous Sections of 327 km Corridor at End of Project

Lucknow - Ayodhya Section (129.8 Km)	3 Packages	LMNHP 1	LMNHP 2	LMNHP 3
	Length	36.8	47.0	46.0
Ayodhya - Gorakhpur Section (116.1 Km)	3 Packages	LMNHP 4	LMNHP 5	LMNHP 6
	Length	27.2	44.0	44.9
Gorakhpur - Bihar Border Section (81.1 km, i.e., excl. Gorakhpur bypass)	2 Packages	LMNHP 7	LMNHP 8	
	Length	40.0	41.1	

3. The component-wise and year-wise break-up of costs pertaining to the three homogenous sections at the time of planning as well as on completion are summarized in Tables A2.3 to A2.6.

Table A2.3: Project Cost at Planning Stage (2002)

Cost Components	Project Cost - Rs Million (2002) [3]			
	Lucknow - Ayodhya Section	Ayodhya - Gorakhpur Section	Gorakhpur - Bihar Border Section [2]	Total
Length (Km)	129.8	116.1	81.1	327.0
Civil Construction	8,577.4	7,672.1	5,091.3	21,340.8
Construction Supervision	294.6	263.5	184.1	742.1
Land Acquisition	319.4	285.7	199.6	804.6
Utility Relocation	27.1	24.2	16.9	68.2
R&R	311.4	278.5	194.6	784.5
Tree Plantation	60.3	54.0	37.7	152.0
Total	**9,590.2**	**8,578.0**	**5,724.1**	**23,892.4**

1. Estimated from the total cost for 'Lucknow - Muzaffarpur Section' of NH28 (483 Km) as indicated in the PAD for LMNHP, November 2004.

2. Gorakhpur Bypass is not included in this Section

3. Estimated using the section length and the Base Year Unit cost arrived from the PAD (2004)

Table A2.4: Project Completed Cost (2012)

Cost Components	Project Cost - Rs Million (2012)			
	Lucknow-Ayodhya Section	Ayodhya-Gorakhpur Section	Gorakhpur - Bihar Border Section [1]	Total
Length (Km)	129.8	116.1	81.1	327
Construction	9,980.60	10,201.30	6,524.08	26,705.98
R&R	190.8	101.50	210.32	502.62
Utility Relocation	144.6	268.50	175.94	589.04
LA	446.4	735.80	1,170.65	2,352.85
Supervision Consultancy	290.4	294.70	142.82	727.92
Total	**11,052.80**	**11,601.80**	**8,223.81**	**30,878.41**
Cost / Km	85.15	99.93	101.40	94.43

1. Gorakhpur Bypass is not included in this Section

Source : NHAI

Table A2.5: Composition of Completion Cost (2012)

Year	Year Wise Cost Rs Million					
	Lucknow - Ayodhya (Packages 1, 2 & 3)		Ayodhya - Gorakhpur (Packages 4, 5 & 6)		Gorakhpur - Bihar Border (Packages 7 & 8)	
2005	168.52	1.5%	171.80	1.5%	173.00	2.1%
2006	1233.14	11.2%	557.40	4.8%	1568.58	19.1%
2007	2411.66	21.8%	1238.40	10.7%	6.33	0.1%
2008	2636.10	23.8%	2272.40	19.6%	1769.68	21.5%
2009	2130.75	19.3%	2453.93	21.2%	1679.87	20.4%
2010	1788.99	16.2%	2453.93	21.2%	1599.62	19.5%
2011	685.64	6.2%	2453.93	21.2%	1426.73	17.3%
Total	**11052.80**	**100.0%**	**11601.80**	**100.0%**	**8223.81**	**100.0%**
NPV@5% to 2004 Price	9022.74		9106.33		6572.73	

Note: For Ayodhya-Gorakhpur Section, total completed cost was available and the phasing for two years from 2009 was not available. Hence, fund distribution for these two years was estimated.

Table A2.6: Comparison of Cost Overrun (2002-2012)

Section	Length (Km)	Base Cost Rs Million - 2004 [1]	Completed Cost - 2012 (Rs Million) [2]		
			Cost Rs Million - 2012	Cost Overrun	%
Lucknow - Ayodhya	129.80	9590.24	11,054.80	1,464.56	15.3%
Ayodhya - Gorakhpur	116.10	8578.02	11,601.80	3,023.77	35.3%
Gorakhpur - Bihar Border	81.10	5724.09	8,223.81	2,499.71	43.7%
Total	**327.00**	**23,892.36**	**30,880.41**	**6,988.04**	**22.6%**

1. Estimated from the total cost for 'Lucknow - Muzaffarpur Section' of NH28 (483 Km) as indicated in the PAD, November 2004;

2. Collected from NHAI Project Directors' Offices of Lucknow and Gorakhpur

2.1 ***Framework of Analysis:*** The following scenarios are considered for the economic analysis.

- ***"Without up-gradation proposal for road sections" (Base Strategy):*** In the analysis, this is the base strategy against which the new construction/up-gradation is compared.
- ***"With up-gradation proposal for road sections in Place":*** In the analysis, this alternative is compared against the base strategy. The 'with LMNHP road project' situation is used to determine the highest levels of benefits.

4. ***Approach:*** The economic evaluation has been carried out within the broad framework of social cost-benefit analysis assuming the analysis period of 34 years including the achieved construction period. The economic feasibility of the project has been sought to be assessed through estimating the economic returns on investment in terms of reduction in road user costs of motorized traffic (MT) and non-motorized traffic (NMT) upon the improvement of the existing road, mainly in the following areas:

- Savings in VOC
- Journey time of passengers and goods savings

5. All costs and benefits are valued in monetary terms and expressed in economic prices to have the analysis on resource-based framework. The analysis is made section-wise and combined for the full project road and the results are expressed in terms of Economic Internal Rate of Return (EIRR) and Economic Net Present Value (ENPV).

6. ***Construction Program:*** The analysis period of the project has been taken as 34 years including construction time. The completed construction program for LMNHP road network is summarized below, in which the actual construction period only considered.

Table A2.7: Construction Program (Observed Project Phasing)

Year	Phasing of Construction (%)		
	Lucknow - Ayodhya	Ayodhya - Gorakhpur	Gorakhpur - Bihar Border
2002	0.0%	0.0%	0.0%
2003	0.0%	0.0%	0.0%
2004	0.0%	0.0%	0.0%
2005	1.5%	1.5%	2.1%
2006	11.2%	4.8%	19.1%
2007	21.8%	10.7%	0.1%
2008	23.8%	19.6%	21.5%
2009	19.3%	21.2%	20.4%
2010	16.2%	21.2%	19.5%
2011	6.2%	21.2%	17.3%
Total	**100.0%**	**100.0%**	**100.0%**

1. Phasing is estimated on the fund dispersal.

Source: NHAI

7. ***Model for Estimation of Benefits:*** The following model has been developed to estimate the aforesaid benefits.

- Identification of homogeneous sections of LMNHP Project Road Section.
- Estimation of present traffic volume on the identified completed road sections/packages from field surveys
- Estimation of traffic growth rate – adopted from the 'initial base analysis of 2003'
- All the unit values adopted during the 'initial base analyses' are maintained. Only the selected variables changed during the project implementation like growth rate, implementation period, its phasing, project cost etc. are suitably included in the model, without changing the analysis base year.
- Cost distribution during the implementation period is discounted to the base year in order to adjust the price escalation.
- Usual maintenance provisions and costs in 'with' and 'without' project conditions have been considered.
- The model used for analysis is HDM-4. This model helps to estimate total road user costs for LMNHP road project in terms of lower VOC cost, time cost, etc.
- EIRRs of the sections have been estimated with HDM but the EIRR of the entire project has been obtained by taking together all the sections
- EIRR and NPV estimation is done with the sum of benefits from (i) VOC savings; and (ii) Time savings

8. Altogether, the above model gives 'Total Project Benefits' for LMNHP project road section. The Total Net Benefits are considered against the economic cost of the project to determine EIRR and ENPV.

9. ***Conversion to Economic Prices and Distribution of Cost:*** The adopted Standard Conversion factor (SCF) to convert the financial cost of project to economic cost is 0.90.

10. ***Components of Cost:*** The financial costs for completed up-gradation of different packages of LMNHP have been collected and per km economic cost has been worked out by applying 0.90 SCF to the financial cost per km and is presented below:

Table A2.8: Financial Cost for Up-gradation of Different Sections

SN	Sections	Length (km)	Financial Cost (million)- Completed (2012)		Financial Cost/ km (In INR) - 2012 Cost Discounted to 2004 (Rs. Million) [2]		
			Total	Cost / Km	Total Financial Cost	Financial Cost/ km	Economic Cost/ km
1	Lucknow - Ayodhya Section	129.8	11,052.80	85.15	9,022.74	69.51	62.56
2	Ayodhya - Gorakhpur Section	116.1	11,601.80	99.93	9,106.33	78.44	70.59
3	Gorakhpur - Bihar Border Section [1]	81.1	8,223.81	101.40	6,572.73	81.04	72.94
	Total	**327**	**30,878.41**	**94.43**	**24,701.80**	**75.54**	**67.99**

1. Gorakhpur Bypass is not included in the Gorakhpur - Bihar border Section

2. Cost used for Economic Analysis

11. ***Maintenance Cost:*** The maintenance works considered in the analysis include (i) Annual Routine maintenance and (ii) Periodic Maintenance

12. The financial costs pertaining to maintenance operations have been converted into economic costs by applying the Conversion Factor of 0.90. The details of the maintenance program have been adopted from the Base Analysis (2002) as shown below.

13. Maintenance (annual and periodic) costs for the base-case and for the proposed project alternatives are given in the following tables. The periodic maintenance cost for base-case as well as for the proposed alternatives would be applicable after 5-year interval.

Table A2.9: Maintenance Cost Adopted for Base-Case

Project Alternative	Terrain Type	Maintenance Type	Maintenance Cost (per Km)	Maintenance Year
Base-Case	Plain	Periodic	0.07 million	Every Five Years
		Routine	0.05 million	Annual
With Upgradation to Four Lane	Plain	Periodic	2.10 million	Every Five Years
		Routine	0.07 million	Annual
		Overlay	11.00 million	After 20 years

14. ***Traffic Specific parametric values:*** The economic unit costs (Year 2002) parametric values for motorized vehicles are used in HDM Model inputs, as shown in Table A2.10. Due to data availability problems, the unit values pertaining to 2002, considered for similar other studies in the region are used in the present analysis.

Table A2.10: Vehicle Economics at Economic Prices

Item	Car	Two Wheel	Three Wheel	Bus	2-Axle Truck	Multi Axle Truck	LCV	Tractor
Vehicle Price	3,03,400	23,925	1,32,483	7,36,700	8,42,200	15,25,000	6,37,600	3,53,127
No. of Wheels	4	2	3	6	6	10	4	7
No. of Axles	2	2	2	2	2	3	2	3
Passengers	4	1	3	25				
Tyre	660	384	763	5,740	5,740	5,740	3,590	2,027
Fuel Per/Lt.	19.3	19.3	19.3	14	14	14	14	14
Lubricating Oil (Rs)	60	60	60	60	60	60	60	60
Maint. Labor (per hr.)	40	25	25	40	40	30	30	50
Crew Wages (per hr)	40		20	80	150	80	40	15
Annual Overhead (RS)	16,571	500	1,841	1,12,347	1,12,347	1,35,000	1,07,084	1,07,084
Intrest Rate (%)	12	8	8	12	12	12	12	12
Passanger Work Time Value (per/hr.)	35	30.1	35	22				-
Non work Time Value (per hr)	11.55	9.06	8	7.33				
Cargo Time Value (per/hr.)	-	-	-	-	57	73	15	-
PCSE	1	1	1	2	2	2	2	
Working Hours	1,950	1,300	3,600	2,200	2,100	2,100	1,500	350
Annual km	32,000	16,000	21,900	1,00,000	75,000	75,000	60,000	4,000
Avg. life	10	10	8	8	8	8	8	10

15. ***The Residual Value:*** Considering the remaining life of the construction items the Residual value (salvage value) has been assessed at the end of the analysis period. For structures, the life is assumed to be 50 years. Values of the selected construction items such as LA, structures, sub-base, social displacement cost etc. are included in the economic analysis as residual values at the end of the analysis periods. These residual values are considered, as benefits to the project in the analysis. The value has been taken as 15%, as considered in the initial base analysis.

16. ***Volume of Traffic and Growth Rates:*** The AADT traffic on different road sections during the period 2002 to 2012 is given below. For analysis, the AADT adopted during the initial analysis (2002) is adopted. However, based on the AADT arrived from the post completion surveys (2012), the actual growth rate achieved during the implementation period (2002-2012) for different vehicle categories is adopted for the present analysis. Accordingly, the AADT and the periodical growth rates adopted for the analysis are presented in Tables A2.11 and A2.12.

Table A2.11: AADT traffic on different road section adopted for analysis

Vehicle Category	Lucknow - Ayodhya			Ayodhya - Gorakhpur			Gorakhpur - Bihar Border		
	2002	2012	AACGR (2002-2012)	2002	2012	AACGR (2002-2012)	2002	2012	AACGR (2002-2012)
A. Motorized Vehicles									
Bus	509	1025	7.3%	47	95	7.3%	233	470	7.3%
Mini Bus	69	138	7.1%	22	44	7.1%	86	172	7.2%
MAV	33	1668	48.0%	40	2031	48.0%	34	1703	48.0%
2/3 Axle Truck	1,780	3343	6.5%	2029	3810	6.5%	1536	2885	6.5%
LCV	562	2174	14.5%	369	1427	14.5%	214	829	14.5%
2 Wheelers	2,315	2984	2.6%	3,123	4062	2.7%	3,324	4303	2.6%
Car/Jeep/Van	2,802	5161	6.3%	1857	3420	6.3%	1466	2701	6.3%
Autorickshaw	286	383	3.0%	272	333	2.1%	587	758	2.6%
Tractors	113	98	-1.4%	136	118	-1.4%	291	252	-1.4%
Total	**8,469**	**16,974**	**7.2%**	**7,895**	**15,340**	**6.9%**	**7,770**	**14,073**	**6.1%**
B. Non - Motorized Vehicles									
Cycle	3,093	1226	-8.8%	1,400	556	-8.8%	1,400	551	-8.9%
Others	163	58	-9.8%	74	25	-10.2%	74	30	-8.6%
Total	**3,256**	**1,284**	**-8.9%**	**1473**	**581**	**-8.9%**	**1473**	**581**	**-8.9%**

1. *Daily traffic during the Initial Analysis in 2002.*
2. *For Lucknow-Ayodhya Section, the data is collected from DPR and for the remaining two sections, base Year AADT are estimated 2012 traffic and the growth rate achieved in Lucknow-Ayodhya Section.*
3. *Daily traffic collected after completion in July 2012.*

Source: (1) NHAI and (2) Consultant's field survey (2012)

Table A2.12: Traffic Growth Rates

Period	Lucknow – Bihar Border Section of NH 28			
	TW	Car	Bus	Truck
Upto 2012 [1/]	2.6	6.3	7.2	12.0
2012-2015 [2/]	6.0	6.0	6.0	5.8
2015-2020	5.0	5.0	5.0	5.8
Beyond 2020	5.0	5.0	5.0	5.1

1. *Based on the post-completion traffic survey (2012) and Base Year traffic (2002) from DPR.*
2. *Adopted from DPR.*

17. ***Model Inputs:*** Road Geometry and Pavement Data are shown at the end in **Appendices A2-I and A2-II** named as HDM input for existing road and HDM input for improved Condition. Post completion survey results had shown considerable improvement in road surface for LMNHP road sections, as shown below.

Table A2.13: Comparison of Road Roughness

SN	Section Name	Length (Km)	Roughness (IRI) - 2002 [1]	Roughness IRI (2012) [2]
1	Lucknow - Ayodhya Section	129.8	4.5	1.9
2	Ayodhya - Gorakhpur Section	116.1	4.2	2.2
3	Gorakhpur - Bihar Border Section	81.1	4.7	1.9
	Total	**327**	**4.4**	**2.0**

Note:

1. Roughness during Initial Stage (2002)

2. Post completion data collection (2012).

Source: DPRs (2002) and Field Survey (2012)

3.0 Project Benefits

18. ***Vehicle Operating Cost Savings:*** The model comprehensively predicts the performance and operating costs of motorized vehicles in the selected fleet. Motorized vehicle performance predictions include speeds (free flow and congested conditions) and consumption. Predictions for vehicle operating costs include fuel, oil, tire and parts costs, crew and maintenance labor costs, capital depreciation, borrowing costs, and overhead costs.

19. HDM-4 has been used to estimate the Vehicle Operating Costs (VOC) for traffic in each vehicle category on each selected road *with* and *without improvement*. The model estimates VOC in both the with- and without-project situations taking into account the speed and travel time including surface quality and road congestion. The resulting VOC values for each road and section can be found in the HDM results.

20. ***Travel Time Saving:*** The model estimates the Value of Travel Time (VOTT) for passengers and goods in transit in both the *with*- and *without*-project scenarios taking into account speed and travel time including surface quality, road congestion, unit time value for different vehicle travelers etc.

21. ***Accident Cost Savings:*** There can be some anticipated reduction of accidents due to improved signing and engineering intervention, the benefits deriving from this rehabilitation project are deemed to be moderate and consequently the accident-related benefits have not been discounted in the HDM analysis. As a result the actual economic return in respect of increased of Road Safety would be expected to be nominally higher than the rates of return presented in this report.

22. ***Economic Viability:*** The economic internal rate of return is calculated by the model applying a project discount rate of 12 percent to the annual undiscounted net differences of the economic elements considered in the analysis. The sum of these discounted values gives the economic net present value (NPV) of the project which is generated and presented.

23. Economic evaluations were carried out for discrete sections of the project road and for the scenarios described below:

24. In the analysis, the '*with project'* improvement alternative is compared with the base option of '*without project'* alternative of maintaining the existing road and minimum maintenance "Do Minimum" i.e.

1. *Base case:* Without improvements and with annual *"Do Minimum"* maintenance
2. *Improvement Alternative:* With improvement and annual "Routine Maintenance" supplemented by a Periodical Maintenance at five-year interval and overlay after 20 years.

25. The results of section wise economic analysis conducted considering modified cost of project packages and their sensitivity analysis after 15% reduction in benefits are summarized in the following table. Another sensitivity factor of increased capital cost during implementation is already covered in the PCR analysis and so not considered.

Table A2.14: Results of the Economic Analysis

Contract/ Road Stretch	Section	Length (km)	Normal Scenario		Scenario with 15% reduction in Benefits	
			EIRR (%)	NPV (Rs. million)	EIRR (%)	NPV (Rs. million)
1	Lucknow – Ayodhya	129.8	28.6	46,407	26.1	39,433
2	Ayodhya – Gorakhpur	116.1	29.3	40,019	26.5	34,007
3	Gorakhpur - Bihar Border	81.1	18.3	17,015	16.7	14,456
	Combined	**327.0**	26.2	103,441	23.8	87,897

26. The EIRRs obtained for road sections of LMNHP are in range of 18.3% - 29.3%, which are more than the required 12%. Hence, the project is found economically viable with increased construction cost. These results show some changes with respect to the earlier study as VOC and travel time cost savings during the analysis period is more after considering the modified construction cost, construction phase, observed traffic during the construction period etc. and vice versa.

27. The sensitivity analysis is conducted after 15% reduction of yearly benefits for analysis period and EIRR obtained for road stretches are in range of 16.7% to 26.5%, which are more than the required 12%.

28. In all sections, the NPV discounted at 12% is positive confirming the economic justification of the project even though the cost of civil works had increased. The EIRR for all the above sections is more than 12%. Combined EIRR for the full Lucknow – Muzaffarpur Section (483 km) during processing stage was 26% and for the reduced project of 327 km length at the time of restructuring was >12%. In the present economic analysis at the end of project, the combined EIRR for the restructured project of 327 km length is 26.2%, which is equal to the EIRR at processing stage. Higher EIRR values in the first two sections, which are mainly due to marginal increase in project cost coupled with higher traffic volume with favorable composition and this, resulted in maintaining the combined EIRR at the same level of values at the end of project.

29. The first reason, which explains the differences in the EIRR, is the considerable increase in construction costs, ranging from 15.3% (Lucknow – Ayodhya Section) to 43.7% (Gorakhpur – Bihar Border Section). The second reason is that the roads became operational later than expected at appraisal and as a result, the savings in the revised economic analysis are based on 2012 traffic volumes while they were based on 2006/2007 traffic volumes in the initial economic analysis. The third reason is that the roads deteriorated between the time the initial economic analysis was carried out and the time the works were completed and roads were improved. The fourth reason is the better traffic growth pattern in the project road sections achieved during the project implementation period (2003-2012). The fifth reason is the change in traffic composition during the implementation period, in favor of heavy and commercial vehicles (**Table A2.15**). Though the first two reasons together have caused negative impact on net benefits, the remaining three reasons discussed above together have resulted in higher savings in VOCs /VOTTs than estimated at appraisal, and resulted in maintaining the EIRR and ENPV at the end of project. This higher economic feasibility further confirms that the improvement of the project road (LMNHP) is justified.

Table A2.15: Change in Composition of AADT during 2002 – 2012

Vehicle Category	Lucknow - Ayodhya (NH 28)				Ayodhya - Gorakpur (NH 28)				Gorakpur - Bihar Border (NH 28)			
	2002	% Composition	2012	% Composition	2002	% Composition	2012	% Composition	2002	% Composition	2012	% Composition
Commercial Vehicles	2,953	35%	8,348	49%	2,507	32%	7,407	48%	2,103	27%	6,059	43%
Private Vehicles	5,117	60%	8,145	48%	4,980	63%	7,482	49%	4,790	62%	7,004	50%
Other Vehicles	399	5%	481	3%	408	5%	451	3%	877	11%	1,010	7%
Total	8,469	100%	16,974	100%	7,895	100%	15,340	100%	7,770	100%	14,073	100%

4.0 Conclusions

30. The results discussed above show the robustness of the economic feasibility indicators under normal and the adverse sensitivity scenarios including when the benefits are decreased significantly. The EIRR for all the three sections is more than 12%. This justifies the project investment with more risk absorption capacity. However, this sensitivity is unlikely to happen (a) as traffic is expected to grow to accompany the current economic growth, (b) there is little uncertainty on the cost of the works as all the contracts are completed and (c) VOCs are unlikely to be reduced in view of the past trend for the price of inputs such as fuel, lubricants, tires, and salaries.

31. The estimated economic feasibility results are on the conservative side to the extent that the qualitative project benefits like tourism development, increased road safety, better highway environment are not considered in this analysis.

Appendix A2-I: HDM Inputs of Existing Roads

SECT_ID	Section 1	Section 2	Section 3
SECT_NAME	Lucknow-Ayodhya Section	Ayodhya –Gorakhpur Section	Gorakhpur-Bihar Border Section
LINK_ID	LMNHP – 1,2 &3	LMNHP – 4,5 & 6	LMNHP 7 &8
SPEED_FLOW	Two Lane Road	Two Lane Road	Two Lane Road
TRAF_FLOW	Inter-urban	Inter-urban	Inter-urban
ROAD_CLASS	Primary	Primary	Primary
CLIM_ZONE	Semi-arid/Tropical	Semi-arid/Tropical	Semi-arid/Tropical
LENGTH (Km)	126.8	116.7	109.2
CWAY_WIDTH (M)	7	7	7
SHLD_WIDTH (m)	1	1	1
NUM_LANES	2	2	2
MT_AADT (Nos)	8469	7895	7770
NM_AADT (Nos)	3526	1473	1473
AADT_YEAR	2002	2002	2002
DIRECTION	2.00	2.00	2.00
RF	2.44	4.25	5
NUM_RFS	1.72	1.43	1.45
SUPERELEV	2.36	2.22	2.28
CURVATURE	15	15	15.08
SURF_STREN	0.35	0.35	0.35
BASE_STREN	0.15	0.15	0.15
SUBB_STREN	0.15	0.15	0.15
COND_YEAR	2002	2002	2002
ROUGHNESS (IRI)	5.5	5.5	3.8
CRACKS_TOT %	16.08	15.32	17.04
RAVEL_AREA %	21.08	20.32	22.04
PHOLE_NUM	22.73	11.72	18.65
EDGEBREAK (Sqm)	106.97	100.95	103.12
RUT_DEPTH (mm)	16.08	15.32	17.04
TEXT_DEPTH (mm)	0.50	0.50	0.50
LAST_CONST	1953	1953	1953
LAST_SURF	1998	1998	1998
LAST_PRVNT	2001	2001	2001
LAST_REHAB	1993	1993	1993

Appendix A2- II: HDM Inputs of Improved Conditions

Parameters	Lucknow-Ayodhya Section	Ayodhya–Gorakhpur Section	Gorakhpur-Bihar Border Section
Improvement Type	Lane Addition	Lane Addition	Lane Addition
Duration of construction(Years)	7	7	7
Starting of Construction (in year)	2005	2005	2005
Road Class	Primary or Trunk	Primary or Trunk	Primary or Trunk
CW Width (m)	14	14	14
Number of lane	4	4	4
Increase in width (m)	7	7	7
Unit Financial Cost (Rs. Million per Km)	85.18	21.06	19.39
Unit Economical Cost (Rs. Million per Km)	76.66	18.95	17.45
Salvage value (%)	15%	15%	15%
New Pavement Type	Ashphalt Concrete	Ashphalt Concrete	Ashphalt Concrete
Structural no.	2.97	2.97	2.97
Surface thickness (mm)	140	140	140
Relative compaction	97%	97%	97%
Speed limit (km/hr)	100	100	100
Observed Roughness on Completion (IRI)	1.9	2.2	2.1
Analysis period(years)	34 Years	34 Years	34 Years
Discount Rate (%)	12%	12%	12%

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Anita Shrestha	Program Assistant	SASEI	ACS
Arnab Bandyopadhyay	Senior Transport Engineer	SASDT	Engineer
Debabrata Chakraborti	Senior Procurement Specialist	SARPS	Procurement
Gaurav Joshi	Environmental Specialist	SASDI	Environment
L. R. Kadiyali	Consultant	SASEI	Highway Engineer
Mridula Singh	Consultant	SASDS	Social
N. S. Srinivas	Senior Program Assistant	SASDO	ACS
Piers Antony Vickers	Senior Transport Specialist	SASDT	Task Team Leader
Priya Goel	Senior Financial Management Specialist	SARFM	Financial Management
Rajesh B.S Dongol	Program Assistant	SASDO	ACS
Sangeeta Anand	Senior Program Assistant	SASEI	ACS
Sonia Chand Sandhu	Senior Environmental Specialist	SASDI	Environment
Sujit Das	Consultant	SASDT	Engineer
Sushil Bahl	Senior Procurement Specialist		Procurement
Tapas Paul	Senior Environmental Specialist	SASDI	Environment
Venkata Rao Bayana	Consultant	SASDS	Social Specialist
Zhi Liu	Lead Infrastructure Specialist	EASTS	Task Team Leader
Supervision/ICR			
A.K. Swaminathan	Consultant	SASDT	Transport Specialist
Anand Kumar Srivastava	Procurement Specialist	SARPS	Procurement
Debabrata Chakraborti	Senior Procurement Specialist	SARPS	Procurement
G. George Tharakan	Lead Transport Specialist	SASDT	Task Team Leader
Krishnan Srinivasan	Consultant	SASDT	Governance
Mridula Singh	Consultant	SASDS	Social
N. S. Srinivas	Senior Program Assistant	SASDO	ACS
Neha Dhoundiyal	Financial Management Analyst	SARFM	Financial Management
Neha Pravash Kumar Mishra	Environmental Specialist	SASDI	Environment
Nupur Gupta	Senior Transport Specialist	SASDT	Transport Specialist
Piers Antony Vickers	Senior Transport Specialist	SASDT	Task Team Leader
Polisetty Viswanath	Consultant	SASDT	Engineer
Pradeep Valsangkar	Consultant	SASDT	IT Specialist
Pratap Tvgssshrk	Senior Transport Specialist	SASDT	Transport Specialist
Priya Goel	Senior Financial Management Specialist	SARFM	Financial Management

Rajesh B.S. Dongol	Program Assistant	SASDO	ACS
Rajesh Rohatgi	Senior Transport Specialist	SASDT	Task Team Leader
Ramola Bhuyan	Senior Financial Management Specialist	SARFM	Financial Management
Rashi Grover Kashyap	Consultant	SASDT	Analyst
Ritu Sharma	Program Assistant	SASDO	ACS
Sonia Chand Sandhu	Senior Environmental Specialist	SASDI	Environment
Sri Kumar Tadimalla	Senior PPP Specialist	SASDT	PPP Specialist & Team Leader (ICR)
Sujit Das	Senior Transport Engineer	SASDT	Task Team Leader
Venkata Rao Bayana	Consultant	SASDS	Social

(b) Staff Time and Cost

Stage of Project Cycle/Year	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY03	10.16	36.03
FY04	22.47	75.97
FY05	20.65	98.50
Total:	53.28	210.50
Supervision/ICR		
FY05	11.56	43.11
FY06	22.80	98.41
FY07	16.68	85.00
FY08	33.74	91.00
FY09	73.97	306.76
FY10	59.62	252.90
FY11	36.40	182.05
FY12	19.52	101.33
Total:	274.29	1160.06

Annex 5. Beneficiary Survey Results

(if any)

Not done.

Annex 6. Stakeholder Workshop Report and Results

1. As part of the ICRR preparation, the team conducted three half-day workshop/discussion sessions with various stakeholders to obtain an understanding of their feedback on the project preparation and implementation. These sessions were organized at Lucknow, Ayodhya/Faizabad and Gorakhpur, respectively, on 7th, 8th and 9th of August 2012. NHAI, in discussions with the Bank team, invited representatives from the following groups of stakeholders:

- Concerned Headquarters, regional and field officers of NHAI;
- Senior officers of the supervision consultant team who worked on the project;
- Senior officers of the contractors' team who worked on the project;
- Truck owners' associations operating trucks on the corridor;
- State bus transport organization representatives operating their buses on the corridor;
- Commercial establishments, factories and industries on the corridor;
- Farmers and agriculture/horticulture players;
- Educational institutions like schools, colleges and training institutes along the corridor;
- Representatives of towns and villages on the corridor;
- Forest, land and revenue officials;
- District administration officials; and
- Police department.

2. A Bank team along with respective package NHAI officers, consultant and contractor representatives numbering 20-40 people, were present at the workshop. The district collector of Gorakhpur also participated in the workshop. There were active and interesting discussions and feedback on all aspects of the project right from the design to construction and on issues like safety, technical, social and environmental safeguards.

3. Most stakeholders were of the opinion that the four-laning of the NH-28 as part of the national program of NHDP had benefitted direct and indirect road users in terms of quicker and more comfortable travel. The general perception was that heavy vehicle travel time from Lucknow to Gorakhpur has now reduced by about 1.5 hours and there is less congestion on the road. This, people felt, may marginally increase with the start of tolling due to waiting times at the toll booths. Access to educational institutions and hospitals has improved and become faster. Owners of land and property along the road were also happy because the values of their assets had increased manifold especially for land near bypasses and new alignments. The overall perception was that the land acquisition and R&R process was done reasonably well except for a few stray cases of dissatisfaction. While some sections of the stakeholders felt that the safety situation is better, many others felt that it had worsened due to increased speeds even in spite of a divided carriageway.

4. The discussions during the workshops also focused on: (i) problems faced during and due to the four-laning of NH-28; and (ii) suggestions for ways to improve the process of planning and construction of such projects. Some of the important issues, problems

and suggestions, which were discussed during the workshops, have been captured in the paragraphs below.

5. Due to increased height of embankment and the construction of service roads, the original **drainage pattern** had been disrupted causing major problems to the wayside community. Many of the drains provided were not properly connected to an outfall, or the inlets to the drains were not located properly to allow surface water to enter the drains. People pointed out that in many places the brick-lined drains had started to fail creating blockages and water overflow. There were small pools of water observed by the mission on the road due to poor surface water draining which could be the cause of skidding and other accidents and faster road deterioration. It was unfortunate therefore to note that in spite of the emphasis being laid on water drainage and provisions being made in the drawings and designs, this had become such a major issue affecting wayside communities.

6. **Safety issues and problems** were also discussed extensively. Problems of trucks and other vehicles moving in the opposite direction to avoid taking a U-turn at the next available median-gap were mentioned. Many unauthorized gaps had been made on the medians by villages and petrol pumps to allow easier access to vehicles to/from the opposite lanes. Accidents are frequently caused by vehicles entering the main road from the spur roads at greater speeds. Some drivers felt that this happened because the spur roads intersected with the main road at a gradient – because the project road has been raised in many places. To overcome this gradient, the tractors carrying agricultural produce have to accelerate while entering the main road, thus causing accidents. Also, traffic signs were reportedly missing on side roads. Deficient road signage at the beginning, end and other crossings of Gorakhpur bypass came in for a lot of criticism by the District Collector and the people at Gorakhpur.

7. People felt that some of the above problems of safety could be addressed by better design of roads including the spur road intersections as well as proper use of signage. Using sign posts and signboards made of materials that do not have a high re-sale value was a suggested solution to them being stolen and sold as scrap. The stakeholders felt that using brick/concrete pillars with asbestos or high strength plastic might prevent the signage from being stolen. The other problems of safety have to be addressed by enforcement of traffic rules, preventing wrong-side driving on highways and unauthorized cutting of medians. A huge programme of road construction and widening such as NHDP has to be accompanied by major safety awareness programs for the wayside communities and vehicle drivers. Accident victims also need to be taken to the nearest hospital within the first Golden Hour and this can now be done with wider roads provided the ambulance facilities reach fast. People suggested that an accident recovery mechanism should be put in place on this highway as in other highways. NHAI officials assured the public that the O&M contracts have now been finalized and would be mobilized shortly. These contractors would be providing some of these facilities.

8. Since the road has now been widened to more than 20 meters and been raised in most built-up areas, there has been some impact due to severing of communities. The need to cross the roads is acute for the villagers and many accidents are reported now because of higher speeds of vehicles and pedestrians crossing the highway. There was a

suggestion that the vehicle underpasses could be made a bit wider and higher to allow safe movement of larger vehicles and pedestrians too. Wherever underpasses are not provided there could be a provision for a grade-separated pedestrian cross-over. There was a suggestion to barricade the built-up areas, with openings only at some places for dedicated pedestrian crossing. The emphasis during the discussions was more on the fact that the communities could have been better consulted on these aspects also.

9. Other important issues which featured during the workshop discussion were:

- There was a clear dissatisfaction over the settlement of road embankment at the bridge approaches causing a huge bump and jolt when vehicles travel at high speed.[1] This issue was raised by stakeholders in all three workshops and pointed out as a potential to cause breakdown of vehicles as well as accidents due to sudden braking.
- Another very important point raised by the public was that the construction traffic with heavy axle loads carrying materials damage the city/town/village and rural roads causing unnecessary expenditure and difficulties to the local citizens. The DC at Gorakhpur cited examples of PMGSY roads and other city roads which have got damaged badly due to the trucks of the Gorakhpur bypass contractor.
- Since the representative of the State Transport Corporation was present at the Lucknow meeting, people expressed their views on the inadequacy of bus services as well as the fact that many buses do not stop at the bus stands. It seems that the bus-drivers and the transport officials are, in some cases, not aware of the new bus stops provided by NHAI on the corridor and hence this problem. Providing for drinking water and proper seating facility at these bus stops was a common demand of the public.
- The representative of the forest department expressed overall satisfaction over how tree-cutting was done and the compensatory plantation was dealt with. However, he mentioned that the Forest Department was not consulted about the plantation on the medians and was not sure whether soil testing was done before finalizing the median plantation. His typical answer to the delays caused to the project due to the tree-cutting process was that it cannot be avoided and has to be factored into the project timeline by NHAI.
- There were some complaints about debris not being disposed of properly on some stretches of the Gorakhpur bypass.

10. The Bank team also had discussions exclusively with the contractors, consultants and NHAI officers. The general feeling was that contractors were weak in planning resource mobilization and activity scheduling and that they should strengthen their planning process. The contractors, on the other hand, felt that proper planning was not possible due to uncertainty in availability of encumbrance-free land. The possibility of a

[1] NHAI have subsequently informed that the bumps at these locations are being repaired by the Contractor during the defect-liability-period.

joint scrutiny by NHAI, SC and Contractor of the work site and then agreeing on a revised work/mobilizing schedule, if required, was discussed. This would allow the contractor to mobilize resources accordingly and for NHAI to pay the mobilization advance accordingly.

11. NHAI and the contractors felt that there were very frequent changes in the key personnel of the SC and this resulted in delays and lack of continuity and consistency in decision-making. Moreover, lack of SC manpower sometimes acts as a constraint for the contract to accelerate its work program beyond a certain limit. The possibility of more severe penalty for changing key personnel in the SC contract was discussed. In addition, a method for the SC to respond to certain changes to the staffing requirement due to changes in contract schedules should be looked into as part of the SC contracts.

12. The discussions did bring out the delays in handing over encumbrance-free land by NHAI and delays in decision making on contractual issues like variations and extensions of time requests. NHAI responded by mentioning that most of the problems of handing over of land were pertaining to state governments. As for delays in decision making on contractual issues there is an urgent need for NHAI to find a solution to fast track the decision making process – probably by more delegation to field level officers who are more conversant with the day-to-day issues in the contract.

13. There was a consensus amongst the contractors, consultants and NHAI that Bank missions did provide valuable inputs during their visit and helped in escalating certain field related issues to the headquarters to ensure higher-level attention. The Bank mission mentioned that issues of delays in contracts etc. could probably be resolved through better project management by the Contractors, Engineer and NHAI.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

1.1 Background

The National Highways Authority of India (NHAI) has been mandated by Ministry of Road Transport & Highways, Government of India, to undertake the works of four - laning and strengthening of NH-28 as part of the East West corridor development (from Porbander to Silcher with total length of 3,640 km) under Phase - II of National Highways Development Project (NHDP). About 653 km. length of this corridor passes through the State of Uttar Pradesh, out of this about 627 km. has already been 4 laned. In balance length, work is in various stages of construction. The section between Lucknow in Uttar Pradesh and Muzaffarpur in Bihar forms a part of this corridor and passes through the cities like Barabanki, Ayodhya, Basti, Gorakhpur, Kushinagar and Gopalganj. The Lucknow - Muzzafarpur National Highway Project (LMNHP), with a total length of 483 km, has been implemented by NHAI with funding from The World Bank. The civil works under LMNHP are being implemented through 12 construction contracts out of this 8 Packages fall in the State of Uttar Pradesh and 4 Packages in the State of Bihar.

The Lucknow Muzzaffarpur project is to widen the existing 2-lane NH section to a 4-lane divided carriageway. The improvements mainly comprises of the following –

- Widening to 4-lane by providing a new parallel 2-lane carriageway with 1.5 m. hard shoulder and rehabilitation of existing carriageway.
- Provision of 5.5/7.0m wide service roads with separators between main carriageway and service road for local traffic in built-up areas.
- Construction of 4-lane bypasses with rigid / flexible pavement
- Construction of flyovers and vehicular / pedestrian underpasses.
- Construction of ROB’s at level crossings.
- Construction of Bridges and culverts.
- Provision of traffic safety and control measures such as signs and markings, signals, delineators, crash barriers etc.

The PCC services under LMNHP commenced in the year 2002 wherein 483 km. of roads were selected for Techno-Economic feasibility in the year 2002.

The studies were funded by the Bank. Detailed Design and Contract preparation of the project was carried out from 2002. The project was appraised by the bank in November 2004 with the project cost to the tune of USD 851.24 mn and subsequently approved loan (IBRD Loan No. 4764 IN) to the tune of USD 620 mn. Project implementation was initiate from 2005. After implementation of the LMNHP, WB desires, as part of its mandatory requirements, to prepare project implementation completion and result report (ICR), which would state the success and/ or failure of the project implementation as well as lessons learned and opportunities for applying such lessons in similar projects in future. One of the components of ICR is Borrower’s Own evaluation of the project. This is to present borrower’s own assessment of performance of key players, outcomes of the project, lessons learnt and suggestions for WB and/or for future project of such magnitude.

1.2 Project Formulation

The intent of having such project like LMNHP took shape from very high growth in vehicle population along with increase in road network length during 1995 to 2001.

The draft road policy recognized the needs due to rapid growing traffic levels and the existing inadequate and deteriorating road infrastructure conditions. As a result the NHAI had sought WB assistance in improving both the capacity and quality of its core State road network.

To address the Road Development Plan NHAI implemented the R&R policy of World Bank, which was consistent with WB's strategy as defined in "India Transport Sector – Long Term Issues Report (1995)".

With this background broad focus areas identified to be part of the project were:

1. Strengthening institutional capacity of NHAI.
2. Reduction of Periodic Maintenance backlog.
3. Increasing in maintenance Funds in real terms.
4. Improving capacity and quality of National Highway network Based on above focus areas, mutually NHAI and WB had framed objectives for LMNHP at Project Appraisal Stage. Accordingly key performance indicators were also finalized as reported in PAD.

1.3 The Project comprises of four components

1. Corridor improvements
    a. Upgrading 483 km. of priority National Highways.
    b. Rehabilitation & Resettlement.
    c. LA and resettlement and rehabilitation of assistance.
2. Road Safety Engineering Program.
3. Institutional Strengthening of NHAI and to prepare follow up studies and implementation of State Road Safety Action plan.

Development Objectives:

The project's principal development objectives are to improve traffic flow and road safety on Lucknow Muzaffarpur road network and to strengthen the institutional and financial capacity of NHAI also. The Project will support the above development objectives by: (a) improving the capacity and quality of highly congested NH-28; (b) improving road maintenance planning and management practices; (c) reducing accidents on major roads; (d) Strengthening the technical, financial and management capacities of the NHAI.

Component 1.

a) Upgrading of about 483 km. of National Highway no. 28.

b) Supervision consultant and Project Co-ordinating services for civil works.

c) Land acquisition, utility relocation and resettlement and rehabilitation (R&R) R&R Implementation support, training, Environmental Management, Govt.'s project management costs.

Component 2. Road Safety Engineering
Component 3. Institutional strengthening services

Key Performance Indicators

The achievement of the projects objectives in line with pre-fixed indicators is summarized through following tabulation.

Performance Indicators	**Achievement**
About 483 km. of high priority NH 4 laned	4 laning
About 500 km. of NH maintained to a 'good' standard (IRI <4.50)	IRI < 2.3 in the entire section of NHAI under LMNHP
Reduce travel time by 20 percent on about 483 km. of roads improved and maintained under Project	Reduction in travel time on about 500 km. close to 24%
At least 100 NHAI project-related staff to have participated in training scheme under various disciplines	About 100 staff trained to date
Implementation of agreed institutional strengthening and modernization action plans	Action plan implementation almost completed (95 percent)

1.4 Project Agencies/Partners

The Project agencies and partners involved in the project are as follows:

- Employer: NHAI, Government of India.
- Funding Agency: The World Bank.
- Consultants and Contractor: List of Consultants and Contractors is attached as Appendix 1**.**

2. PROJECT IMPLEMENTATION AND EVALUATION

2.1 Component wise details

The objectives and benefits have been substantially achieved through the following six component of the projects:

Component 1 (a) – Upgrading: Total length of 483 km. of NH has been 4 laned. In all eight contract packages covered this upgrading length of 483 km, which was supervised by international consultants. Regular meetings by NHAI & CSC with all concerned agencies and rating of construction changes during implementation has yielded good results. Also consultants imparted training to implementing agencies and their staff on job. The roads are constructed to a high standard and attain travel time reduction and also achieved good riding quantity which is comparable to standard International Roughness Index (IRI) of less than 2200-2300 mm / km. Consequently, travel speeds have increased close to 30 percent. The new 4 lane road is inherently safer than before. Higher speed may have an effect on accident cause and severity but not due to geometric deficiency.

Surveys of road users and stakeholders, especially those located adjacent to the new roads, have revealed only satisfaction of the obvious advantages that the improved roads have provided in terms of riding comfort, speed and aesthetics. Clearly the commercial, Social and environmental benefits are significant and reflect GOI's development goals. Although the design of the project road was carried out earlier by the PCC M/s. CES, M/s. ICT etc. The PCC services primary included; development financial management system, contract document preparation, procurement issues, and construction monitoring, training quality assurance appraisal, design changes and contract management advice to the project director and Project Implementation Unit (PIU). Three international consultants were employed to supervise the upgrading works for eight highways contract packages namely M/s. LASA, M/s. RI – CEG (JV) & M/s. PFC-FPI – FTE (JV).

Component 2 – Land Acquisition and Resettlement and Rehabilitation: In association with Component 2 Land Acquisition and R&R was carried out successfully and in line with the WB's safeguard policies. Implementation of the R&R was carried out under separate Resettlement Action Plans (RAP) for each of the Phase. The NHAI as part of its institutional arrangements established the CRRO, which was responsible for implementing the RAPs with the assistance of NGOs; procured specifically for the purpose. The Project-Affected-Person and families (PAPs) were for the most part satisfied with the RAP implementation and associated compensation and training provided. During the RAP process a grievance redressal committee was established to hear and adjudicate grievances. The land acquisition process took a time, longer than expected, but was completely successful. However in few locations the engineering design had to be adjusted due to problems in acquisition. NHAI made extraordinary efforts and applied new methods like direct purchase through negotiation to speed up land acquisition. However due to non-commensurate actions of revenue department and a few other departments of GOUP related to utility shifting that there were delays in handling over land to commence the civil works in certain sections of the project roads.

Component 3 – Road Safety Engineering: Improvement of 34 accident prone spots have lowered the accident rate by 22% as far as fatal accidents are concerned & the accident rate for non-fatal accidents has reduced by 50%. The NHAI also had taken up projects on developing model safe roads under this component.

Impact of Institutional Development on Social and Environmental Management

- Continued existing of the Environmental cell through the project period.
- Formation of the Environmental and Social management Cell in the PIU.
- Enhanced capacity of NHAI Engineers on environmental management through training
- Building the awareness of road contractors in environmental management, particularly through the workshop.
- Reduced dust pollution due to improved road surface conditions.
- Survival of trees planted under the compensatory Tree Plantation programme.

2.2 Delay and other concurrent problems faced

2.2.1 Reason for Delays

Even though the project could be successfully completed, it was delayed for about three years. The main reason for the delays were:

1. Time required for land acquisition was not adequately considered with respect to award of the civil works.
2. There was delay in handling over encumbrance free land for unhindered progress of work. The fast track arrangement for land take over did not work as fast as anticipated due to department delay (Revenue). Moreover the social impact of LA was more than 10 times that of any other projects of this nature in India due to density of population and ribbon-type development along the road and R&R was intense even in rural areas.
3. LA plans did not account for road levels and utility relocation
4. Some delay has occurred due to presence of numerous underground services in the urban areas which were not identified at the project preparation stage. This was compounded by lack of cooperation by services owners and local residents.
5. Higher number of disputes on contractual issues and delays in decision making has also resulted in delay.
6. Unprecedented rains in 2008.
7. Complaints of local public on dumping of debris in to their properties by the contractors during construction and lack of proper access to the residence where cutting and filling was involved.

2.2.2 Problems faced

i. Continuous rainy seasons:
   (a) Short working period due to prolonged monsoon season.
   (b) Shortage of construction materials during rainy season and
   (c) Closing of water courses at exit point of CDs cross drainages by local land owners.
ii. The High intensity of traffic during construction was a hurdle in overall progress of the work, especially for the sections where traffic was heavy and/ or urban/town sections.
iii. Contractor's susceptibility to compromise on quality of work.
iv. Lack of accountability and ownership sense from CSC.
v. Contractor's failure to mobilize required resources as per work programme.
vi. In town areas, problems were encountered due to presence of unknown underground utilities. Identification and relocation of unknown undersigned utilities during the construction have been one of the problems.
vii. Problem in construction did arise because of lack of effective inter departmental coordination, such as Revenue, forest and other agencies.
viii. Heavy vehicular traffic on urban and rural link of the corridors.
ix. Unauthorized closing to exit points of CDs by the adjacent land owners.
x. Tendency of contractors to resort to Arbitration on minor issues.
xi. Steep rise in prices of bitumen and steel during project implementation period had upset the contractor's financial planning.

2.3 Economic Re-valuation upon completion

There are considerable adverse changes in the inputs considered for ICR stage re-evaluation analysis, particularly in increased cost, and increased implementation period. Overcoming all these negative parameters, return on investment was found to be increased for most of the road sections due to the increased traffic level; i.e. actual traffic level were much higher than the traffic forecasted at appraisal stage. The details of Completed Costs for LMNHP Packages as Appendix 2**.**

3. ASSESSMENT OF IMPLEMENTATION PROJECT

3.1 By Borrower (NHAI)

i. Being the first project of its kind and unique socio-economic environment of NHAI provides internal rating to the project as satisfactory. This statement gets support of user satisfaction surveys, economic re-evaluation after implementation completion and enhanced skills-capabilities of NHAI staff along with contractors.

ii. The NHAI officers were actively involved in the corridor readiness activities, local liaison, monitoring of the works, environmental/social issues and gained indirect experience of the duties of the Engineer and contract administration under FIDIC conditions. This will be of great utility for other projects of such magnitude.

iii. The evaluation and pre-qualification and award of contracts were prompt.

iv. During project execution the NHAI Offices were actively involved, especially in implementation of Environmental Management Plan (EMP) and RAP.

v. Overall contribution from CRRO had been excellent. Implantation of RAP, regular site visits, interactions with contractors and consultants, imparting training to their staff on job as well as in taking contractual actions against contractors have greatly helped in successful implementation of EMP and ESMP.

vi. The NHAI also resorted to direct purchase of land in few odd cases from the PAP/families through negotiation involving active participation of land-owners groups. This was in compliance of R&R policy compliance with OD 3.40 of the World Bank. This process is faster than the LA Act for NH 1997 and there are no further liabilities on the part of the Government or PAPs.

vii. A tree planting strategy was worked out and trees were planted on all project roads.

viii. Auditors are normally not aware of FIDIC contract conditions, roles and responsibilities etc. and are increasing work load for department by raising number of not required quarries.

ix. The Banks support missions were of a generally high standard and beneficial to the project. The Bank's rigorous mission, touching the minute details had helped in successful completion of civil works, financial monitoring, quality control, implementation of EMP and R&R, though it sometimes felt tedious to the implementing agency. The comments and suggestions in Aide Memoire had helped in solving the problems with other line departments of GOUP.

x. A frequent staff changes amongst the consultants and Revenue department and NGOs was an issue, which constantly arose during the project duration. Replacements of consultants were not found of same caliber of the original staff and on many occasion it has been observed that the personnel employed by the

consultant are always project specific and not belonging to the regular establishment of the consultant. Such project specific personnel lacks elegance towards work, therefore the quality of work suffers.

xi. Though the Environmental Guidelines and R & R framework prepared by PCC has received open appreciation from Bank and other government agencies but the contractors have a tendency to attach less importance on implementing the EMP and ESMP in the true spirit.

xii. Many audit observations were raised by comptroller & Auditor General's office. Many of the observations were raised as the audit staffs were not used to audit such works under FIDIC condition. However these were later on dropped by the Comptroller and Auditor General of India (CAG), except for a few cases.

xiii. In all, the project has been completed and received good appreciation from all spheres. The able assistance from WB, contribution from consultants and contractors made it possible to provide quality infrastructure. The targeted benefits to the community are getting realized and will continue to accrue in years to come.

xiv. This project has set number of standards on various aspects; to be particular about reducing claims and disputes though many cases were referred. The facts and figures in respect of claiming are:

	DRB	**Arbitration**	**Court of Law**
Total number of Cases Referred	28		1
Number of cases in Favor of NHAI	4		nil
Number of cases in Favor of Contractor	20		nil
Number of cases in progress	4	24	nil

xv. Though the NHAI had limited previous experience in handling disputes, such good experience and exposure have made department more confident to take on with similar projects in near future.

4. LESSONS LEARNED AND SUGGESTIONS

4.1 Lessons Learned

i. **Avoid major delays between Project Preparation and Implementation:** Due to this there could be major variation at the implementation of a Resettlement Action Plan (RAP), and quantities, mainly in earth work.

ii. Involvement of NGOs and sociologists at field is a prerequisite for bridging the gap between the PAPs and the project and in effective management of R&R and other social issues.

iii. **Requirement of adequate diversion width and temporary acquisition:** Temporary land acquisition for traffic diversions where insufficient space exists within the ROW was one of the major problems.

iv. The contract provided for performance BG to be valid until a date 28 days from the dated of issue of Taking Over Certificate. This should be normally valid 28 days beyond the completion date of Defect Liability period.

v. **Environmental management to be part of project acquisition:** Environment Management is an aspect of the contract which is very difficult to control with

widespread abuses by the contractor, ruled simply by cost versus profit. The majority of bidders will not make sufficient allowance in their price and do their best to avoid or minimize their expenditure on EMP compliance after contract award.

vi. **Need for Safety Audits:** Safety audits were felt inadequate at the completion stage.

vii. **Define substantial completion of the project:** The basic requirements to satisfy substantial completion are not clearly defined in the documents.

viii. **Actual deployment of Contractor's Key Staff:** Contractor's key personnel named in the schedule or approved replacement candidates are sometimes not available at works site during normal working hours. Sometimes contractor's foreman or junior technical personnel manage the day to day construction activities at site. This has adverse impact on the quality of work.

ix. **Define Role of Project Consultants appropriately:** Neither in contract for civil works nor in construction supervision contracts the role and mandate of Project Coordinating Consultant has been clearly defined.

x. **CSC time lines beyond project completion:** Normally reference for arbitration is made after completion of work and by that time the CSC has already demobilized his establishment from project office, therefore the entire onus of defending the matter before the arbitrator lies on the Employer. Though such decision was taken independently by the CSC without making any reference to the Employer, but still the Employer who is ignorant about the matter is required to defined the same before the arbitrator. Absence of a contract specialist in the Team of CSC resulted in increase of disputes.

xi. The contract provided for performance BG to be valid until a date 28 days from the dated of issue of Taking Over Certificate. This should be normally valid 28 days beyond the completion date of Defect Liability period.

xii. General

- Upfront training of the engineers and contractors were useful in ensuring EMP compliance.
- Difficulties in administering EMP measures with the contractor through the provisions in the FIDIC contracts.
- Importance of careful drainage planning as improper drainage leads to the destruction of the road surface.
- Difficulties in obtaining leveled land for establishing campsites.

4.2 Suggestions

From the lesson learned and experience from the project some of the suggestions brought out into the notice are given below.

4.2.1 Suggestions for Improving Project Preparation:

i. Time gap between the completion of project preparation and commencement of implementation preferably should not be more than 6 to 9 months.

ii. Effective and vigorous Public Consultation should be conducted on proposals regarding realignment, and bypass to incorporate their views and local requirements.

iii. Proposal for shifting of utilities coming in the right of way should be made based on proper surveys and consultations with the concerned departments and be made part of contract.

iv. The work of land acquisition and shifting of utilities should be well planned and coordinated. All pre-construction activities should be completed before award of work.

- Land plans to include requirement of land for utility relocation.
- Loss of access to properties adjacent to the road should also be considered during impact assessment.

v. Temporary land acquisition for traffic diversion should be identified as far as possible and resolve at the design stage in such cases where insufficient space exists within the ROW.

vi. Sites for Disposal of waste/ surplus material satisfying environmental criteria should be identified and indicated at the DPR stage to allow proper pricing by the bidders and the contractor to locate proper sites during execution of work disposal.

vii. It is proposed to ensure that BoQ items are put into the bidding documents that properly reflect the value of the EMP compliance.

viii. Avoid frequent transfer.

Design and DPR Stage

i. Whilst international standards were extensively used, it is ultimately preferable that wherever available Indian standards and codes of practices are given priority particularly as they continue to improve and reflect the actualities of local conditions.

ii. In the absence of legal axle weight enforcement enhance factor of safety for, stronger pavement in design will be required for corridors carrying high or even moderate volumes of industrial traffic.

iii. Where traffic diversions are required, the practicability of constructing diversions should be determined at the design stage & not during construction.

iv. Introduction of formal safety audits at the design stage is commensurate with international practice for subsequent projects.

v. While preparing longitudinal profile plan adequate care should be taken to avoid environmental impacts due to cutting and filling.

vi. Joint verification with revenue personnel prior to finalization of LA Plans.

vii. Marking of the RoW.

4.2.2 Suggestions for Improving the Bidding and Contract Document:

4.2.2.1 Instructions to Bidders (ITB)

i. A Condition may be incorporated in prequalification document and ITB stating that the unofficial sub-contracting of work either in part or whole is prohibited. Further a condition to this effect should also be included in COPA or GCC whereby if during execution, it is discovered that a contractor had indulged in practice of unofficial sub-contracting, he would be summarily disqualified for future tendering in the WB financed projects.

ii. Joint Venture partners, who abscond from their responsibilities should be subject to punitive action. A condition in ITB and COPA should be incorporated stating that the JV partners would be considered as one entity and would respond to the need of the contract as and when required. Responsibilities of JV partners should be clearly defined.

iii. About checking and verification of Financial Statements of Joint Ventures, the contractual powers should be given to Employer to perform this task, when even contract is in force; the details like existence of JV, its Financial Statements and JV as one entity's projects related documents.

iv. The format of Bank Guarantee should be in accordance to RBI Directives.

v. It is suggested that submission of a bid modification through separate letter be strictly prohibited.

vi. A specific time limit for clarification process should be incorporated in the ITB within which if a bidder fails to provide the required information, his bid should be considered non responsive.

vii. Position of Planning Engineer and Chief Quality Surveyor should be included in the list of Contactor's key personnel. All key personnel should be employee of the main contractor.

4.2.2.2 Conditions of Contract

i. The basic requirements of satisfying substantial completion should be defined in the documents.

ii. The Power of attorney clause should be deleted from the GCC.

International Competitive Bidding

iii. Under FIDIC conditions of contract and COPA, time limit is not prescribed for rectification of defects noted or identified during defect liability period. According to the Clause 49.4 in case of default at the part of the contractor in carrying out such instructions within a reasonable time the employer will rectify the defect at the risk and cost of contractor. The reasonable time is very vague term. Because of this deficiency in contract conditions, the contactors often avoid timely rectification of defects causing inconvenience to the public. To avert such situation it is suggested to include the following provisions in COPA. Every time notice of defect is given, the contractor shall correct the notified defect within the length of time specified by the Engineer's notice.

iv. A definite time limit should be prescribed from the date of serving of notice to adjudicate the disputed matter to DRB / Adjudicator by any party to the actual date of making reference for adjudication.

4.2.3 Suggestions for Improving Supervision Consultant's Service

i. The make-up of staff with strong international experience and local staff should be more balanced if international consultants are to be employed otherwise the benefit of employing an international consultant is diminished.

ii. Replacement staff must be equal in caliber to the outgoing incumbent and in place in a timely fashion. Such replaced person should be inducted only after approval by the client. The remuneration should be reduced to 90 percent for such replacement each time.

iii. Procedure for monitoring the performance of CSC should be evolved and incorporate in the TOR of CSC.

iv. It is suggested that consultant's personnel posted on site supervision works should belong to the regular establishment of the consulting firm.

v. The entire onus of defending the matter before the arbitrator lies on the Employer. It is suggested that the CSC should be made responsible to provide his input until the arbitration process is over. A condition to this effect should be included in the terms reference of CSC services. The contract empowers CSC to take decision in respect of many aspects of exclusions without employer's concurrence. If any dispute arises, act of such decision taken by engineer, onus of defending such disputes should entirely be on the CSC. If any extra payment results from disputes, CSC should be made to pay the same in such cases.

vi. Accountability and liabilities of CSC and PCC have not been clearly laid out in the TOR of services. The TOR should include this aspects also.

4.2.4 Suggestions for Borrower's Effectiveness

i. Government Auditors are not exposed with FIDIC contract conditions, before start of the project implementation; training shall be imparted to group of Auditors.

Appendix 1. Borrower ICR - Additional information: List of Contractors and Consultants of LMNHP NH-28

Civil Contract Package	Name of Contractor	Name of Design Consultant (PCC)	Name of Supervision Consultant
LMNHP-EW-II (WB) 1	HCC ltd.	CES	LASA Pvt. ltd.
LMNHP-EW-II (WB) 2	HCC ltd.	CES	LASA Pvt. ltd.
LMNHP-EW-II (WB) 3	HCC ltd.	CES	LASA Pvt. ltd.
LMNHP-EW-II (WB) 4	HCC ltd.	ICT	RI-CEG (JV)
LMNHP-EW-II (WB) 5	NCC ltd.	ICT	RI-CEG (JV)
LMNHP-EW-II (WB) 6	BSCPL Infrastructure ltd.	ICT	RI-CEG (JV)
LMNHP-EW-II (WB) 7	NCC – VEE (JV)	CPCS – UPHAM	PFC-FPI-FTE (JV)
LMNHP-EW-II (WB) 8	Simplex Infrastructure ltd.	CPCS – UPHAM	PFC-FPI-FTE (JV)

Appendix 2. Completed Costs for LMNHP Packages

Completed Costs for LMNHP Packages WB-1, WB-2 & WB-3 (in Crores of Rupee)

Package No/Section	From KM	To KM	Cost CategoryDetails	2006	2007	2008	2009	2010	2011	2012
Package 1	8.25	45	Construction Cost	0	28.47	57.97	69.43	54.98	51.70	25.34
			R&R WORKS	0.02	0.20	2.93	3.87	1.06	-	0.52
			UTILITY RELOCATION	2.46	0.20	-	-	0.02	-	-
			Land Acquisition (LA)	1.96	11.87	9.71	0.01	0.42	-	0.06
			SUPERVISION CONSULTANCY(SC1)	0	1.19	1.35	2.31	1.45	1.14	2.37
			Total	4.44	41.93	71.96	75.62	57.93	52.84	28.29
Package 2	45	92	Construction Cost	0	29.24	77.76	90.27	62.09	46.40	18.18
			R&R WORKS	0.02	0.24	2.80	3.76	0.12	0.48	0.08
			UTILITY RELOCATION	0.79	0.85	-	-	0.07	-	-
			Land Acquisition (LA)	1.58	10.14	4.50	-	0.44	-	-
			SUPERVISION CONSULTANCY(SC1)	0	1.53	1.72	2.66	2.46	1.56	0.68
			Total	2.39	42.00	86.78	96.69	65.18	48.44	18.94
Package 3	92	135	Construction Cost	0	37.15	80.64	87.39	84.55	75.74	20.76
			R&R WORKS	0.02	0.64	0.06	1.24	0.34	0.42	0.26
			UTILITY RELOCATION	10	0.07	0	0	0	0	0
			Land Acquisition (LA)	0	0	0	0	3.85	0.1	0
			SUPERVISION CONSULTANCY(SC1)	0	1.5	1.68	2.62	1.19	1.33	0.3
			Total	10.02	39.36	82.38	91.25	89.93	77.59	21.32

Completed Costs for LMNHP Packages WB-4, WB-5, WB-6, WB-7 & WB-8 (in Lakhs of Rupees)

Package No/Section	From KM	To KM	Cost CategoryDetails	2006	2007	2008	2009	2010	2011	2012
Package 4	135	164	Construction Cost	0	1,885.00	5,762.00	12,966.00			33,201.00
			R&R WORKS	3	4.00	5.00	126.00			278.00
			UTILITY RELOCATION	394	804.00	811.00	811.00			844.00
			Land Acquisition (LA)	6	6.00	422.00	460.00			1,716.00
			SUPERVISION CONSULTANCY(SC1)	0	156.00	317.00	510.00			983.99
Package 5	164	208	Construction Cost	0	-	1,436.00	6,569.00			31,937.00
			R&R WORKS	3	4.00	4.00	125.00			438.00
			UTILITY RELOCATION	628	972.00	972.00	972.00			1,006.00
			Land Acquisition (LA)	8	1,508.00	1,774.00	774.00			4,579.00
			SUPERVISION CONSULTANCY(SC1)	0	144.00	314.00	505.00			980.99
Package 6	208	251.7	Construction Cost	0	643.00	6,257.00	15,439.00			36,875.00
			R&R WORKS	3	5.00	6.00	127.00			299.00
			UTILITY RELOCATION	666	674.00	675.00	1,654.00			835.00
			Land Acquisition (LA)	7	343.00	602.00	852.00			1,063.00
			SUPERVISION CONSULTANCY(SC1)	0	144.00	319.00	510.00			981.99
Package 7	279.8	319.8	Construction Cost	0	1,416.70	5,999.00	11,161.07	16,658.79	23,967.03	32,952.24
			R&R WORKS	7	25.51	63.97	158.27	752.35	1,460.53	1,510.53
			UTILITY RELOCATION	890	866.35	1,109.29	1,109.29	983.84	982.84	982.84
			Land Acquisition (LA)	7	764.04	1,784.85	4,036.77	7,662.08	7,726.62	7,730.03
			SUPERVISION CONSULTANCY(SC1)	0	66.20	184.80	314.25	470.86	646.47	784.76
Package 8	319.8	360.915	Construction Cost	0	13,020.57	5,857.48	12,668.48	19,868.56	27,356.27	32,288.57
			R&R WORKS	8	35.28	106.85	233.52	584.49	592.68	592.68
			UTILITY RELOCATION	811	820.61	870.31	880.35	776.53	776.53	776.53
			Land Acquisition (LA)	7	349.95	1,353.14	4,355.06	3,799.14	3,912.93	3,976.45
			SUPERVISION CONSULTANCY(SC1)	0	50.58	149.43	258.82	417.93	548.84	643.45

COMMENT OF BORROWER
ON IMPLEMENTATION COMPLETION AND RESULTS REPORT

The draft ICR was shared with the Borrower and NHAI. In response, NHAI have suggested couple of amendments in the report to reflect the current status on the following aspects:

1) Page no. 47 item no. 9: The bumps at the location of structures with approaches slab is being repaired by Contractor regularly during DLP.
2) Page no. 55 item no. 3.1 xiv: The no. of cases in favour of NHAI is Four (4). The no. of cases in favour of contractor are twenty (20).

The above amendments have been duly incorporated in the report.

Annex 8. Other Aspects & Suggestions w.r.t. Social & Environmental Management

1. Additional salient features of the LMNHP project with respect to social aspects are:

- *Incorporation of the lessons learnt from previous projects:* Based on the experience of TNHP and GTRIP, this project had improved R&R provisions to address complex land ownership issues which included assistance at the replacement value for land losers with unclear titles, like people residing in the "abadi" lands, people allotted with land under different government schemes, etc. Similarly, informal share croppers were identified and provisions for their rehabilitation were made beforehand. Several capacity building workshops were conducted by the World Bank team before and during the project period both for the PIU staff, project NGOs and involved Revenue and Forest officials.
- *Building community confidence through successful relocation of religious properties and other common properties:* About 253 religious properties consisting of temples and mosques and other reverential structures – including a large Ashram (a religious institution) - were successfully relocated. These measures have facilitated winning the community trust and helped in implementation of the land acquisition and R&R program.
- *Skill upgrading and income generation schemes* were conducted for about 2,700 unemployed youth through training programs imparting skills including for repairing agricultural equipment, tractors and two-wheelers.
- *Involvement of NGOs in land acquisition in addition to R&R:* To overcome the issues of (a) inadequate capacity with Revenue Department to carry out the survey work for LA; and (b) 'land ownership' issues due to continuous fragmentation of land holdings, NHAI has taken the onus of tasks such as ownership identification and structure valuation, etc, through engaging NGOs to support the Revenue Department. NHAI appointed four NGOs for the entire project period. This helped in advancing the identification of the actual owners on the ground and in establishing a data base that was subsequently passed on to State Land Acquisition Officers for their use in legalizing the actual owners. This also helped in minimizing the disputes among the family members and facilitated understanding of their due share in the compensation and assistance amounts. The compensation by the competent authority and the assistance by the project authority were distributed in the village itself by the NGO team through a doorstep disbursement campaign in a transparent manner. PIUs with the assistance of the NGOs ensured that all PAPs received their due/entitled compensation with convenience and with updated information.
- *Effective awareness programme and R&R public consultations:* Complete disclosure of project information and R&R policy was made within the first five months of the project. PAPs were better informed regarding their losses. Establishment of public contact during the preparation stage through consultations helped the project in gaining acceptability. In a rural context, women's participation in large meetings remains a challenge. This was addressed through ensuring the deployment of female staff in NGOs, who, in turn, contacted women through home visits and encourage them to participate in the meetings.

2. Some of the suggestions for improving the processes pertaining to social and environmental aspects are as follows:

- During the DPR stage, prepare LA plans based on actual staking out of Right of Way/Corridor of Impact on site rather than by superimposing the alignment map on the revenue map; also, update revenue maps.
- Improve quality control of LA plans and RAP baseline through audit of, say, 15 to 20% of LAPs and RAPs, and ensure that the consultant's plans are accurate and implementable; for this, NHAI may have to develop in-house capabilities by bringing in Revenue Department officers.
- For land owners with unclear titles, develop guidelines for establishing title for those with valid claims and assess typology of land ownership pattern and make provisions accordingly in entitlement framework;
- At least Section 3 (D) notification should be issued by the time of issuing the tender;
- Prior to award of civil contracts, acquire 100% land in first milestone; 75% in second and 50% in third milestone stretch;
- Public Consultations: Extensive and continuous public consultations both during DPR preparation and project execution stages are needed to address critical issues affecting/involving communities, e.g. road safety, bypasses, grade separation, service roads, religious structures, etc. There is a need to involve the state administration more proactively in providing feedback to the design for minimizing issues/grievances during project execution.
- Design and execution of drainage works require more attention, respectively through proper quality checks (a) at the DPR stage with particular attention to proper provisions for outfalls and connectivity; and (b) during the implementation and before issuing the "substantial completion" certificate. This is critical to avert serious deficiencies such as, for example, improper inlet arrangement, lack of provision of proper covers, protruding hooks and improper access to properties and thereby minimize many unwarranted environmental, health and safety impacts.
- Attention to EHS issues and compliance could be enhanced by making the approval of the Environment and Safety Officer (ESO) of the Supervision Consultant a pre-requisite for the processing of the RFI and invoice.
- There is a need to review the contracting arrangements/mechanisms to execute environmental protection and mitigation works. The main civil works contractor lacks interest in executing small works such as construction of noise barriers, washing platforms and enhancement of community properties causing delays and quality issues (as works are not supervised properly).
- Large projects like LMNHP that take several years for preparation and execution are not able to respond quickly to changing conditions on the ground such as increased traffic levels, changing land-use, urban sprawl and development of large institutional areas along the highway. In such a scenario, the safety requirements change and mechanisms have to be found (both within and outside the project purview) to respond to these changing circumstances.

Annex 9. List of Supporting Documents

A. Bank Staff Assessments/Supervision/Project Documents

1. Aide Memoires and Management Letters and Environmental/Social notes of various Preparation, Appraisal, Implementation Support and Supervision Missions, 2000 to 2012.
2. Country Strategy for India, The World Bank Group, September 2004.
3. Country Strategy for the Republic of India for the period FY 2009-12, The World Bank Group, November 2008.
4. Implementation Completion and Results Report for *India: Allahabad Bypass Project*, January 2010.
5. Implementation Completion and Results Report for *India: Grand Trunk Road Improvement Project*, March 2009.
6. Implementation Completion and Results Report for *India: Third National Highways Project*, October 2008.
7. Implementation Status Results Report: Sequence 15, 2012.
8. Implementation Status Results Report: Sequence 15, 2011.
9. Implementation Status Results Report: Sequence 14, 2011.
10. Implementation Status Results Report: Sequence 13, 2011.
11. Implementation Status Results Report: Sequence 12, 2010.
12. Implementation Status Results Report: Sequence 11, 2010.
13. Implementation Status Results Report: Sequence 10, 2009.
14. Implementation Status Results Report: Sequence 9, 2009.
15. Implementation Status Results Report: Sequence 8, 2008.
16. Implementation Status Results Report: Sequence 7, 2008.
17. Implementation Status Results Report: Sequence 6, 2007.
18. Implementation Status Results Report: Sequence 5, 2007.
19. Implementation Status Results Report: Sequence 4, 2006.
20. Implementation Status Results Report: Sequence 3, 2006.
21. Implementation Status Results Report: Sequence 2, 2005.
22. Implementation Status Results Report: Sequence 1, 2005.
23. Mid-Term Review of *Lucknow Muzaffarpur National Highway Project*, February 2008.
24. Project Appraisal Document for *India: Grand Trunk Road Improvement Project*, May 2001.
25. Project Appraisal Document for *India: Lucknow Muzaffarpur National Highway Project*, November 2004.
26. Project Appraisal Document for *India: NHAI Technical Assistance Project*, November 2010.
27. QALP-1 Assessment of *Lucknow Muzaffarpur National Highway Project*, 2008
28. Restructuring Project Papers for *India: Lucknow Muzaffarpur National Highway Project*, March 2010 and June 2012.

B. Other Documents

1. Various Annual Reports of the National Highway Authority of India and the Ministry of Road Transport Highways.

Annex 10. PDO Indicators-Baselines, Original & Revised Targets and Achievement

Indicator	Baseline Value	Original Target Values			Formally Revised Values			Actual Value Achieved at Completion	%ge Achievement w.r.t.
		From Figures	From %ge		From Figures	From %ge (PAD)			
			%	Number		%	Number		
Indicator 1: Vehicle Travel Time (in mins) - Car									
Lucknow-Ayodhya	115	95	20%	92	95	20%	92	95	17%
Ayodhya-Gorakhpur	110	75	20%	88	75	20%	88	100	9%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	137(Original)/ 145(Adjusted)	78	20%	110	52	20%	116	90	38%
Gopalganj-Muzaffarpur	171	97	20%	137	Deleted			Not Applicable	
Total	533(Original)/ 370(Adjusted)	345	20%	426	222	20%	296	285	23%
Indicator 2: Vehicle Travel Time (in mins) - Truck									
Lucknow-Ayodhya	199	115	20%	159	115	20%	159	150	25%
Ayodhya-Gorakhpur	165	110	20%	132	110	20%	132	119	28%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	173(Original)/ 183(Adjusted)	90	20%	138	60	20%	146	140	23%
Gopalganj-Muzaffarpur	198	111	20%	158	Deleted			Not Applicable	
Total	735(Original)/ 547(Adusted)	426	20%	588	285	20%	438	409	25%
Indicator 3: Vehicle Operating Cost (Rs./Km) - Car									
Lucknow-Ayodhya	4.07	3.37	10%	3.66	3.37	10%	3.66	3.50	14%
Ayodhya-Gorakhpur	4.65	3.71	10%	4.19	3.71	10%	4.19	3.50	25%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	3.67	3.67	10%	3.30	3.67	10%	3.30	3.50	5%
Gopalganj-Muzaffarpur	3.81	3.89	10%	3.43	Deleted			Not Applicable	
Total	4.05(Original)/4. 13(Adusted)	3.66	10%	3.64	3.57	10%	3.72	3.50	15%
Indicator 4: Vehicle Operating Cost (Rs./Km) – Truck									
Lucknow-Ayodhya	14.06	10.60	10%	12.65	10.6	10%	12.65	13.10	7%
Ayodhya-Gorakhpur	10.27	8.10	10%	9.24	8.10	10%	9.24	13.00	-27%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	13.30	9.82	10%	11.97	9.82	10%	11.97	13.00	2%
Gopalganj-Muzaffarpur	13.57	9.77	10%	12.21	Deleted			Not Applicable	
Total	12.85(Original)/ 12.59(Adusted)	9.60	10%	11.57	9.55	10%	11.33	13.04	-4%
Indicator 5: No. of Road Accidents - Fatal									
Lucknow-Ayodhya	41	--	10%	37	--	10%	37	32	22%
Ayodhya-Gorakhpur	22	--	10%	20	--	10%	20	43	-95%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	98	--	10%	88	--	10%	88	29	70%
Gopalganj-Muzaffarpur	104	--	10%	94	Deleted			Not Applicable	
Total	265	--	10%	239	--	10%	145	104	36%
Indicator 6: No. of Road Accidents – Non-fatal									
Lucknow-Ayodhya	277	--	10%	249	--	10%	249	138	50%
Ayodhya-Gorakhpur	121	--	10%	109	--	10%	109	228	-88%
Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass)	239	--	10%	215	--	10%	215	92	61%
Gopalganj-Muzaffarpur	285	--	10%	257	Deleted			Not Applicable	
Total	922	--	10%	830	--	10%	573	458	28%
Indicator 7: User satisfaction with national highways in the region to be improved									
Value (Quantitative or Qualitative)	No baseline survey done	No Quantitative Targets			Deleted at the time of restructuring			Not Applicable	

Note: In case of the third homogeneous section, that is, Gorakhpur-Gopalganj (Original, 106km, without bypass)/Bihar border (Revised, 112km, with bypass), the baselines and revised targets for travel time and VOC for Cars and Trucks has been adjusted pro-rata with the change in the length of the section on account of restructuring.

Annex 11. Package-wise Time & Cost Overruns and Survival of Afforested Trees

Package	Length (Km)	Cost (Rs. Crore)			Time (in Days)			Survival rate of Affores-ted trees (%)
		As per Contract	On Completion (incl. variations+ escalation)	Overrun (%)	As per Contract	On Completion	Overrun (%)	
I	36.8	198.06	287.89	45%	1095	2136	95%	71%
II	47.0	212.34	323.94	53%	1095	2190	100%	50%
III	43.0	249.95	386.23	55%	1095	1933	77%	62%
IV	29.0	255.00	538.14	111%	1095	2011	84%	70%
V	44.0	266.00	399.42	50%	1095	2265	107%	50%
VI	43.7	262.00	592.14	126%	1095	1948	78%	80%
VII	40.0	253.00	921.55	264%	1095	2226	103%	80%
VIII	41.1	260.00	1110.60	327%	1095	2342	114%	70%
Weighted Average				128%			95%	

Annex 12. Salient Features of the National Highway Development Project

1. National Highways Development Project (NHDP) was aimed at alleviating a variety of problems plaguing the country's arterial road network of National Highways, viz., under investment, neglect of maintenance, congestion, slow speeds, high vehicle operating costs and poor safety. NHDP sought to address these problems through a combination of higher investment and better management and ushered in a variety of new institutional, financing and contracting practices, as detailed below.

2. To begin with, it was conceived as a programmatic approach. The first two phases of NHDP were aimed at strengthening and widening nearly one-fifth of the National Highway network to a four-lane standard. These phases are also commonly known as Golden Quadrilateral (GQ, 5,846 km, connecting the four major cities of Chennai, Delhi, Kolkata and Mumbai) and North-South and East-West Corridors (NS-EW, 7,300 km, connecting Srinagar to Kanyakumari and Silchar to Porbandar).

3. Second, the responsibility for implementation was given to the National Highways Authority of India (NHAI), an autonomous statutory organization operating under the aegis of the Ministry of Road Transport and Highways (MoRTH).

4. Third, the program was designed to be financed mainly through payments from road users in the form of indirect (cess on motor fuels) and direct (tolls) charges. Further, revenue flows from the indirect user charges were secured through a ring-fenced, non-lapsable Central Road Fund.

5. Lastly, in addition to the traditional Bill-of-Quantity (BoQ) contracts for highway upgrading works (followed up with separate annual contracts for maintenance), NHDP started trying Build-Operate-Transfer (BOT) concessions. Under these concessions, private sector operators selected through a competitive process were engaged to not only construct but also operate and maintain the roads for a longer period and allowed to recover their costs through: (i) tolls from road users and viability gap support (where necessary and determined through bidding); or (ii) availability based payments (annuities) from the government. Such an arrangement had the potential to better incentivize the private partners to take a life-cycle perspective on costs and thereby optimize investment and operating efficiencies during the entire period of the concession. It also explicitly recognized and (contractually) committed resources for the maintenance, which used to be often neglected in the earlier regime of annual funding allocations and contracts.

Annex 13. Summary of ICR Ratings of the Earlier Projects in Support of NHDP

Rating Criterion	**Grand Trunk Road Improvement Project (GTRIP)**	**Allahabad Bypass Project**	**Third National Highways Project (TNHP)**
Outcomes	Moderately Unsatisfactory	Moderately Satisfactory	Moderately Satisfactory
Risk to Development Outcome	Substantial	Moderate	Substantial
Bank Performance	Moderately Unsatisfactory	Moderately Satisfactory	Moderately Satisfactory
Quality at Entry	*Moderately Unsatisfactory*	*Moderately Satisfactory*	*Moderately Satisfactory*
Quality of Supervision	*Moderately Satisfactory*	*Satisfactory*	*Moderately Satisfactory*
Borrower Performance	Moderately Unsatisfactory	Moderately Satisfactory	Moderately Unsatisfactory
Government	*Moderately Satisfactory*	*Satisfactory*	*Moderately Satisfactory*
Implementing Agency/Agencies	*Moderately Unsatisfactory*	*Moderately Satisfactory*	*Moderately Unsatisfactory*


INDIA
LUCKNOW-MUZAFFARPUR NATIONAL HIGHWAY PROJECT
PROJECT HIGHWAY
2 NATIONAL HIGHWAY UPGRADING UNDER THE GRAND TRUNK IMPROVEMENT PROJECT
2 NATIONAL HIGHWAY UPGRADING UNDER THE THIRD NATIONAL HIGHWAYS PROJECT
24 NATIONAL HIGHWAYS
PROPOSED ALLAHABAD BYPASS
PROPOSED GORAKHPUR BYPASS*
*Gorakhpur Bypass is not Bank financed. It is subject to the same safeguard management as the rest of the project road.
OTHER ROADS
RAILROADS
RIVERS
CITIES, BY POPULATION:
Gorhar <100,000
Katihar 100,000–250,000
Gaya 250,000–500,000
Varanasi 500,000–1,000,000
Patna 1,000,000–2,500,000
Patna STATE CAPITALS
STATE BOUNDARIES
INTERNATIONAL BOUNDARIES
UTTARANCHAL
NEPAL
Haldwani
Moradabad
Rampur
Pilibhit
Sambhal
Bareilly
Budaun
Shahjahanpur
Ganga
Hardoi
Sitapur
Ghaghara
Bahraich
UTTAR
PRADESH
Fategarh
Lucknow
Barabanki
Faizabad
Ayodya
Gorakhpur
Etawah
Chambal
Kanpur
Unnao
Bhind
Pratappur
Sikandra
Bhognipur
Rae Bareli
Fatehpur
Khaga
Jaunpur
Maunath Bhanjan
Gandak
Muzaffarpur
Darbhanga
Chapra
Arrah
Patna
Begusarai
Bihar Sharif
BIHAR
Jhansi
Kokhraj
Allahabad
Naini
Handia
Varanasi
Mirzapur
Mughal Sarai
Mohania
Son
Dehri
Sasaram
Gaya
Aurangabad
Sherghati
Barachatti
Giridih
Gorhar
Bokaro Steel City
Barwa Adda
Bermo
Dhanbad
JHARKHAND
MADHYA PRADESH
Satna
Rewa
CHHATTISGARH
30°
80°
82°
86°
28°
26°
84°
0 100 200
KILOMETERS
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