ASIAN DEVELOPMENT BANK **RRP:IND 31435**

REPORT AND RECOMMENDATION

OF THE

PRESIDENT

TO THE

BOARD OF DIRECTORS

ON A PROPOSED LOAN

AND

TECHNICAL ASSISTANCE GRANT

TO

INDIA

FOR THE

WESTERN TRANSPORT CORRIDOR PROJECT

August 2001

CURRENCY EQUIVALENTS

(as of 15 August 2001)

Currency Unit	–	Rupee/s (Re/Rs)
Re1.00	=	$0.0212
$1.00	=	Rs47.13

In this report, an exchange rate of $1.00 = Rs44 was used for calculation purposes. This was the rate prevailing during appraisal.

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected persons
BOT	–	build-operate-transfer
CAG	–	Controller and Auditor General of India
DRF	–	dedicated road fund
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMAP	–	environmental management action plan
FIDIC	–	Federation Internationale des Ingenieurs-Conseils
FIRR	–	financial internal rate of return
GQ	–	golden quadrilateral
IBRD	–	International Bank for Reconstruction and Development
IEE	–	initial environmental examination
JBIC	–	Japan Bank for International Cooperation
LIBOR	–	London interbank offered rate
MOF	–	Ministry of Finance
MORTH	–	Ministry of Road Transport and Highways
NGO	–	nongovernment organization
NH	–	national highway
NHAI	–	National Highways Authority of India
NHDP	–	National Highways Development Program
O&M	–	operation and maintenance
PIU	–	project implementation unit
PMI	–	performance monitoring indicator
PPP	–	public-private partnership
PWD	–	Public Works Department
RAP	–	resettlement action plan
SPV	–	special-purpose vehicle
TA	–	technical assistance
VOC	–	vehicle operating cost
WTC	–	western transport corridor

NOTES

(i) The fiscal year (FY) of the Government ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends. For example, FY2001 begins on 1 April 2000 and ends on 31 March 2001.

(ii) In this report, “$” refers to US dollars.

CONTENTS

LOAN AND PROJECT SUMMARY

Borrower	India
Project Description	The overall objective of the Asian Development Bank's (ADB's) interventions in the highway subsector is to establish a policy and institutional framework for efficient and sustainable development of the national highway (NH) systems. This objective will be achieved through a series of interventions in the next several years. The proposed Project will be the first in the series of interventions. The Project will also address India's immediate need to reduce capacity shortage in the NH systems. The Project will finance upgrading of the existing two-lane single carriageway to a four-lane divided highway on the Tumkur-Haveri section of about 259 kilometers (km) on part of National Highway 4 (NH4) in the state of Karnataka.
Classification	Thematic: Economic growth Private sector development
Environmental Assessment	Category B An initial environmental examination was undertaken and the summary is attached as a core appendix.
Rationale	India's highway sector has long suffered from lack of funding, weak capability to implement projects, poor policy coordination, and resultant delay in decision making. Launching a national highway development program (NHDP) of an unprecedented scale, the Government decided to address these long-standing problems. The Government has taken a number of actions to boost the source of funds for highway development and facilitate private sector participation in highway development and maintenance. While these actions have significantly contributed to resolving the problems, major challenges still remain. These include introducing more sophisticated financial instruments, diversifying methods of involving the private sector, and enhancing financial and managerial autonomy of the National Highways Authority of India (NHAI) with the eventual goal of corporatization. These challenges cannot be addressed by a one-time intervention. ADB envisages taking a programmatic approach to address these challenges from a longer term perspective. Beside these longer term challenges, the Government faces imminent needs to alleviate the inadequate capacity of the NH systems. A core part of the Government program is to upgrade the golden

quadrilateral (GQ), 6,000 km of the national highway network connecting four major metropolitan cities: Delhi, Mumbai, Chennai, and Kolkata. The western transport corridor (WTC) is the busiest part of the GQ, passing through Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu states.

Given the higher traffic volume of the WTC over other parts of the GQ, it was decided to apply the concept of public-private partnership (PPP) along this corridor. A development strategy based on the PPP concept was developed in 2000 under ADB technical assistance (TA). The strategy identified two sections as pilot projects: (i) Jaipur bypass project using PPP funding, and (ii) Tumkur-Haveri project using public sector financing. NHAI decided to develop the Jaipur bypass project with the creation of a special-purpose vehicle (SPV) for the eventual participation of the private sector in development, and operation and maintenance (O&M).

For the publicly funded portion, ADB proposes to extend financial assistance to upgrade the Tumkur-Haveri section of NH4. This Project was designed to incorporate a number of road safety features such as median strips, service roads, bypass, underpasses, overpasses, and fencing. These design features are unprecedented elsewhere on the GQ to date and will act as a model for safety awareness in designing similar highways in India's highway sector.

Objectives and Scope

The overall objective of the Project is to advance policy reforms in India to create an enabling environment for the efficient and sustainable development of the NH system with substantial participation of the private sector. The policy framework developed and agreed upon with the Government will serve as a road map for future lending to India's highway sector.

The proposed Project is designed to achieve four specific objectives: (i) remove capacity constraints on a critical section of the WTC; (ii) enhance road safety by introducing design features that will reduce traffic accidents and minimize negative impacts of road construction on people in the Project's zone of influence; (iii) enhance the corporate finance capability of NHAI; and (iv) increase private sector participation in the development, and O&M of the NH system.

To realize these objectives, the proposed Project will consist of investment, capacity-building, and project implementation support components. Investment components include those for (i) upgrading the Tumkur-

Haveri section of 259 km, and (ii) enhancing road safety by incorporating specific design features. Capacity-building components include those for (i) enhancing corporate finance capability with an aim to facilitate the eventual transition of NHAI into an efficiently managed autonomous entity such as a corporation; (ii) commercializing O&M by offering these functions on concession basis to the private sector; (iii) carrying out safety audit to learn from experience during construction and improvement; and (iv) establishing a more rationally structured toll system and increasing public acceptance of tolls through effective public campaign. The project implementation support components include (i) providing construction supervision services, and (ii) providing environmental management training to staff of NHAI, contractors, and supervision consultants.

Cost Estimates

The total cost of the Project is estimated at $378 million equivalent. The foreign exchange cost is estimated at $240 million (64 percent of the total project cost), and the local currency cost at $138 million equivalent (36 percent).

Financing Plan

It is proposed that ADB provide a loan of $240 million, covering the entire foreign exchange cost of the Project, while the Government will provide $138 million equivalent to cover the entire local currency cost.

($ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Asian Development Bank	240	0	240	64
Government	0	138	138	36
Total	**240**	**138**	**378**	**100**

Loan Amount and Terms

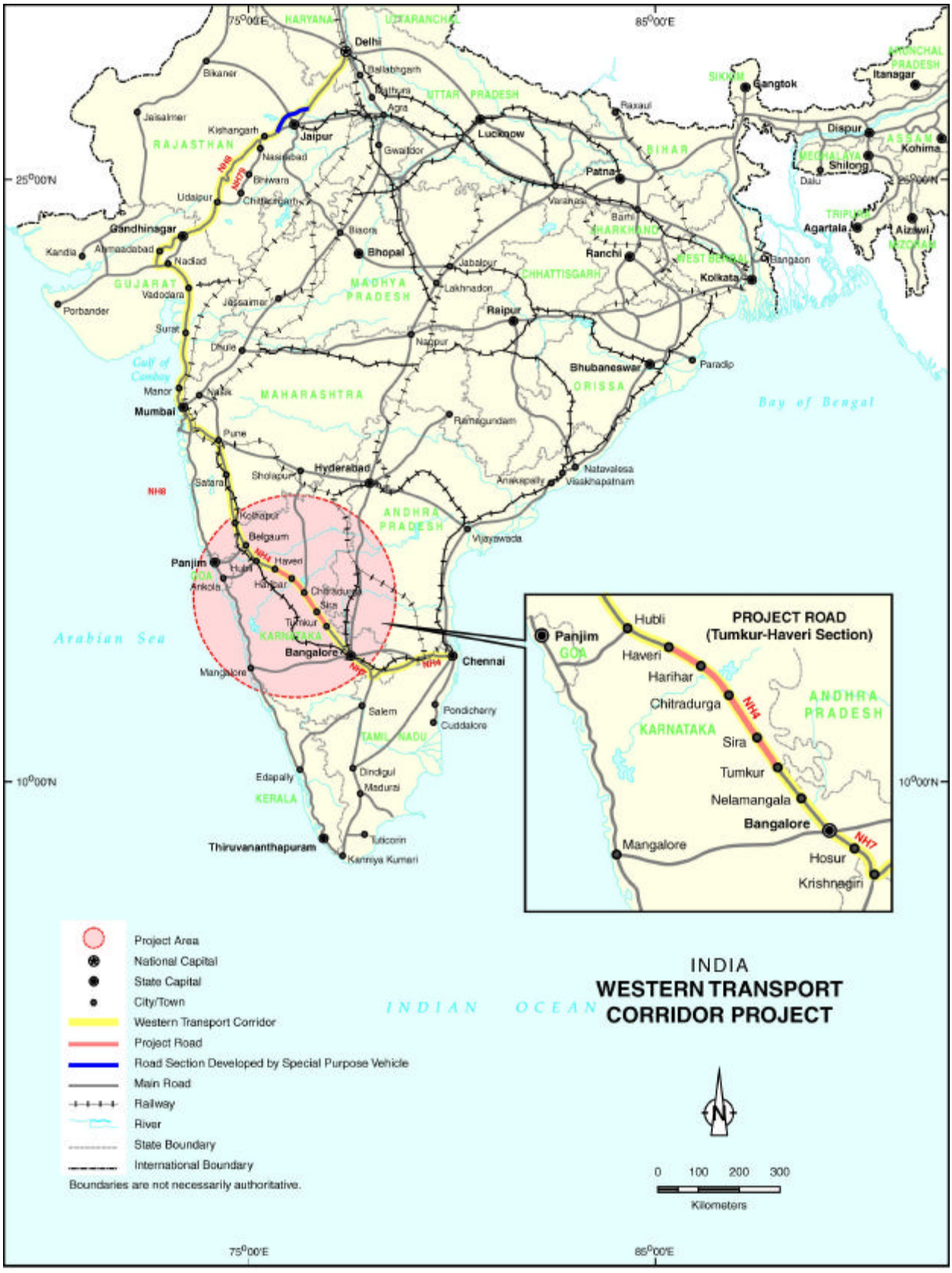
A loan of $240 million from ADB's ordinary capital resources will be provided under ADB's LIBOR-based lending facility. The loan will have a 25-year term, including a grace period of 5 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75 percent per annum, a front-end fee of 1.0 percent, conversion options that may be exercised in accordance with the terms of the draft Loan Agreement, the Loan Regulations and ADB's *Conversion Guidelines*, and such other terms and conditions set forth in the draft Loan Agreement. The Government will make available the loan proceeds to NHAI for the purposes of the Project. The current policy of the Government's assistance to NHAI is 80 percent in grant and 20 percent as a loan. The Government will bear the foreign exchange risk on the loan.

Period of Utilization	Until 31 December 2005
Executing Agency	National Highways Authority of India (NHAI)
Implementation Arrangements	The Project will be implemented by a project implementation unit to be established within NHAI.
Procurement	The civil works contract packages will be procured in accordance with ADB's *Guidelines for Procurement,* following international competitive bidding procedures.
Consulting Services	International and domestic consultants will provide construction supervision and environmental management training. They will be recruited in accordance with ADB's *Guidelines on the Use of Consultants,* and other arrangements acceptable to ADB for engaging domestic consultants.
Estimated Project Completion Date	30 June 2005
Project Benefits and Beneficiaries	The main quantifiable benefit accruing from the Project consists of savings in vehicle operating costs, which will reduce transport costs. The economic internal rate of return of the Project is estimated at 38 percent. Direct project beneficiaries are road users and transport operators. Since the transport industry in India is competitive and is likely to pass on the benefits of transport cost savings to end users, the general public will be another beneficiary of the Project. The improved transport system will bring significant economic and social benefits to local communities. Better transport systems will increase employment opportunities along the highway. The enhanced road safety features of the Project will significantly reduce road traffic accidents. Since the major victims of accidents are pedestrians and livestock, the rural population living along the project highway will significantly benefit from the upgraded highway. The Project will also bring significant benefits to the rural poor. While the proportion of Karnataka State's population below the poverty line is above the national average, the state has suffered from the existence of intrastate discrepancy in the poverty ratio. An improved road network will reduce this intrastate discrepancy by (i) enabling villagers to shift from subsistence farming to commercially oriented agricultural surplus production,

and (ii) facilitating the rural population's movement to better paid occupations such as those in manufacturing or trading. The project areas are characterized by a higher presence of scheduled castes and scheduled tribes, the most disadvantaged groups of people in Indian society. Construction works and tree planting, together with ensuing maintenance works, will be immediate income-earning opportunities to groups of people who do not have stable wage earning jobs and depend largely on occasional employment.

Technical Assistance

In conjunction with the Project, a TA is proposed to implement the capacity-building component for corporate finance enhancement of NHAI. The total cost of the TA is estimated at $900,000, of which ADB will finance $700,000 from the ADB-funded TA Program. The TA consultants will be recruited in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for engaging domestic consultants. The Executing Agency for the TA will be NHAI.


INDIA
WESTERN TRANSPORT CORRIDOR PROJECT
PROJECT ROAD (Tumkur-Haveri Section)
Project Area
National Capital
State Capital
City/Town
Western Transport Corridor
Project Road
Road Section Developed by Special Purpose Vehicle
Main Road
Railway
River
State Boundary
International Boundary
Boundaries are not necessarily authoritative.
Kilometers
Arabian Sea
Bay of Bengal
INDIAN OCEAN
Delhi
Mumbai
Bangalore
Chennai
Hyderabad
Kolkata
Panjim
Hubli
Haveri
Harihar
Chitradurga
Sira
Tumkur
Nelamangala
Mangalore
Hosur
Krishnagiri
RAJASTHAN
GUJARAT
MADHYA PRADESH
MAHARASHTRA
KARNATAKA
ANDHRA PRADESH
TAMIL NADU
KERALA
ORISSA
GOA
UTTAR PRADESH
BIHAR
JHARKHAND
CHHATTISGARH
WEST BENGAL
HARYANA
SIKKIM
ASSAM
MEGHALAYA
TRIPURA
MIZORAM
ARUNACHAL PRADESH
75°00'E
85°00'E
25°00'N
10°00'N

I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on a proposed loan to India for the Western Transport Corridor Project. The Report also describes proposed technical assistance for enhancing the corporate finance capability of the National Highways Authority of India (NHAI), and if the proposed loan is approved by the Board, I, acting under the authority delegated to me by the Board, shall approve the technical assistance.

II. INTRODUCTION

2. A large portion of the national highway (NH) network in India urgently needs improvement. Large traffic volumes on the mainly two-lane NH network inflict heavy social and economic costs, adversely affecting all levels of society and all sectors of the national economy. During the 1998 Country Programming Mission, the Government requested the Asian Development Bank (ADB) to consider financing a series of projects along the western transport corridor (WTC) connecting the three major metropolitan cities of Delhi, Mumbai, and Chennai. The first of these projects, the Surat-Manor Tollway Project, was approved by the Board in July 2000.

3. During the ADB Country Consultation Mission in August 2000, the Government requested that project processing for a second project commence at the earliest possible time with use of detailed project reports prepared by NHAI's consultants. In response to this request, a Reconnaissance Mission, Fact-Finding Mission, and Appraisal Mission[1] were fielded in September 2000, November 2000, and February 2001, respectively. This report is based on the findings of these missions. The overall project framework is in Appendix 1.

III. BACKGROUND

A. Sector Description

4. India has an extensive and diversified transport system comprising about 3.3 million kilometers (km) of roads, 62,809 km of rail, 12 major and 139 minor ports, four major international airports, 86 domestic airports, and about 14,500 km of navigable inland waterways. The modal mix between road and rail transport has been continuously shifting from rail to road because of changing demands for transport services. Consequently, road transport is now the dominant mode of transport, accounting for 60 percent of freight movement and 80 percent of passenger traffic, with rail transport accounting for much of the remainder. A profile of transport in India is given in Supplementary Appendix A.

1. Transport Planning and Coordination

5. Transport planning, coordination, and policy setting at the Central Government level are handled by several line ministries, with overall coordination by the Planning Commission. A previous key ministry, Ministry of Surface Transport (MOST), was reorganized in November 2000 into two ministries: Ministry of Road Transport and Highways (MORTH) and Ministry of Shipping and Ports (MOSP). MORTH's duties relate to the development and maintenance of national highways, and policies on road transport. In addition, it coordinates state roads and issues guidelines on highway planning, design, and construction. MOSP is responsible for major ports, inland water transport, and shipping. All railway planning and operations are under the

[1] The project processing team comprised S. Tsukada, Senior Transport Specialist/Mission Leader, IWTC; T. Kandiah, Senior Investment/Programs Officer, INRM; P. Vallely, Transport Specialist, IWTC; V. S. Rekha, Counsel, OGC; R. Jayewardene, Resettlement Specialist, SOCD; Yue-Lang Feng, Environmental Specialist, ENVD; S. Tukuafu, Financial Management Specialist, IWOD; and J. Arnold, Consultant.

Ministry of Railways. The Ministry of Rural Development is responsible for policy development, monitoring, and coordination of rural roads. Airports and civil aviation are the responsibility of the Ministry of Civil Aviation and Tourism.

6. The responsibility for developing and maintaining NH's rests with the central Government, while state and district roads are the responsibility of the state governments concerned. Because it is desirable to separate the planning and operational functions of the government, the Government established NHAI in 1988 as its operational arm for NH development and maintenance. NHAI has taken over a designated part of MORTH's responsibility for developing and maintaining the NH system. NHAI's responsibilities include the golden quadrilateral, north-south and east-west corridors, and several links to major ports and industrial centers. NHAI covers one fourth of the national highway network length, and MORTH is responsible for the remaining part.

2. Road Network and Traffic

7. The road network in India is divided into three categories: (i) NHs, (ii) state highways, and (iii) district roads and rural roads (Appendix 2). The national and state highways facilitate mobility in the country's transportation system. The district and rural roads provide the much needed means to meet social needs and to transport agricultural produce to markets. The road network in India grew by 7.5 times from 400,000 km in 1951 to 3.3 million km in 2000 (including 200,000 km of urban roads). Road density is now 1.0 km per square km, which compares favorably with that in other developing countries. But despite the length of the road network, its quality and capacity are grossly inadequate for present and future demand for freight transport and passenger traffic.

8. The NH network of 57,700 km carries about 40 percent of total road traffic. However, 39 percent of this national highway network is still of single-lane standard, 59 percent is two lanes, and the four-lane highways, account for only 2 percent.

9. Over the last 10 years from fiscal year (FY) 1990/91 to 1999/2000, annual passenger transport by road grew at the rate of 7.8 percent and freight transport by 7.6 percent, which is slightly higher than the growth rate of the gross domestic product (GDP) (7.5 percent) for the same period. By 2001, passenger traffic is expected to reach about 3,000 billion passenger-km and freight traffic, 800 billion ton-km.

3. Vehicle Fleet and Road Transport Industries

10. The vehicle population grew from 300,000 in 1950/51 to an estimated 50 million in 1999/2000. Buses and trucks accounted for 1 percent and 5 percent, respectively, cars and jeeps for 12 percent, and motorcycles and scooters (two-wheelers) for 68 percent; the remaining vehicles were mostly autorickshaws (three-wheelers) and agricultural tractors. Nationally, the number of automobiles has been growing at approximately 5 percent a year, whereas heavy commercial vehicles have registered a growth rate of 6 percent over the last 10 years.

11. India's automobile manufacturing industry has been regulated since independence. In 1947, the Government declared that only indigenous firms operating according to an approved plan could manufacture motor vehicles. This led to the establishment of a vehicle manufacturing industry basically using domestic capital with little use of foreign technologies. Deregulation started with the two-wheeler segment in mid-1980s. It was followed by opening up of passenger car and commercial vehicle segments in 1990s to encourage the production of more fuel-efficient, safer, and better quality vehicles at reasonable prices. In 1996/97, 3.1 million motor

vehicles were manufactured in India, an increase of 114 percent over the 1992/93 level, due to the unprecedented increase in manufacturing two- and three-wheeler vehicles – from 1.1 million to 2.6 million during the same period.

12. The private sector almost wholly provides road freight operations. The national freight fleet increased from 963,000 in 1985/86 to 2,600,000 in 1999/2000. Light commercial vehicles increased much faster than the heavy commercial vehicles. The industry has a multilevel structure. Shippers usually contact transport companies that have financial capability to assume legal liabilities associated with cargo haulage. Since these transport companies have limited trucking fleet, most trucking services are provided with the use of trucks to be arranged by cargo brokers. When transport companies receive order from shippers, they contact cargo brokers based in the regions where the cargo originates. These brokers (usually individuals) will then contact truck owners (who are again often individuals) or truck drivers, who often wait for cargoes at truck parking lots or along highways. Truck parking lots are usually found at the outskirts of cities, most of them had informally emerged and often are surrounded by small buildings where cargo brokers are located. The performance of the trucking industry is poor because of (i) the high proportion of overage vehicles; (ii) lack of backhaul cargoes; and (iii) lack of loading/unloading facilities, which does not allow transshipment from larger to smaller trucks, often needed at the peripheries of major cities where truck bans are in force.

13. The public and private sectors provide passenger services through road transport. Over the years, the share of the public sector in the total fleet of buses has declined. While in 1980/81 the public sector held 45 percent of the total number of buses in the country, in 1995/96 its share came down to 25 percent.

4. Revenues/Expenditures and Road Fund

14. The Central Government provides funds for developing and maintaining NHs from a yearly budgetary allocation, while the respective state governments provide funds for state highways, and district and rural roads. Transport investments have accounted for about 13 percent of total public sector spending under the Government's Seventh (FY1985-FY1990) and Eighth (FY1992-FY1997) Five-Year Plan (FYP) periods. Expenditure on roads increased 250 percent from Rs63,350 million under the Seventh FYP to Rs160,930 million under the Eighth FYP, although the road sector's share of total transport investment remained at about 22 percent under both periods. Under the Ninth FYP (FY1997-FY2002), the transport budget allocation increased by about three times from the Eighth FYP to Rs2,000,000 million, of which Rs400,000 million (20 percent) is to be spent on roads.

15. A central road fund in India has existed for years. Since its source of funds had been very limited, the Central Government decided to revamp this fund into the Dedicated Road Fund (DRF). The major source of this fund is additional excise duties (called "cess") of Re1 per liter of petrol or diesel. The former was introduced in 1998 and the latter in 1999 through the Central Road Fund Ordinance. These new sources of funds are expected to bring Rs60 billion per annum (equivalent to $1.3 billion) of funding to the road sector. To institutionalize DRF, Parliament passed the Central Road Fund Act 2000 in November 2000. According to its allocation formula and assuming Rs10 billion is raised from petrol and Rs50 billion from diesel, approximately Rs25 billion will be allocated for rural roads, Rs20 billion for NHs, Rs10 billion for state highways, and Rs5 billion for railway crossings and other purposes. Unlike a typical road fund, which is primarily used for maintenance, DRF will be used mainly for developing the road network (Supplementary Appendix B).

5. Maintenance

16. Over the years, NH network maintenance has not received adequate attention because of inadequate fund allocation. In the Ninth FYP, the budget allocation for NH maintenance was more than doubled compared to that in the previous plan period. Notwithstanding this, the maintenance shortfall, which was up to 48.3 percent in 1993/94, was only reduced to about 43.7 percent in FY2000.

17. NHAI, which is required to maintain NHs entrusted to it, currently does so through the Public Works Departments (PWDs) or contracts it out to a private contractor (occasionally NHAI does it by itself). The maintenance cost has been covered by budgetary support from the Central Government. Faced with rapid expansion in the road network entrusted to it, NHAI has decided to explore the possibility of introducing an asset management concept to maintain and manage its road network more systematically. It commissioned a study under World Bank funding on the corridor management units (CMUs). A key element of the CMU concept is to operate and maintain the road network through a series of concessions to private contractors. A CMU is also responsible for ensuring the integrity of the right-of-way by maintaining fences and markers, taking necessary accident prevention measures including safety signal and equipment, removing obstacles on roads, controlling emission, and keeping noises within acceptable limits. If necessary, NHAI is given authority to introduce traffic management. With the recent completion of the study, two pilot CMUs will be established under the Third National Highway Project of the World Bank.

6. Road Safety

18. The number and severity of road accidents in the country have been increasing. The 1995 fatality rate (24 fatalities per 10,000 vehicles)[2] was double that in 1982. Road fatalities in 1999 reached 80,000 for the country, with NHs accounting for 34 percent of the total. Road safety is a serious concern in India along all NHs. The sharp increase in the volume of traffic and overloaded trucks has aggravated the problem. Overcrowded buses pose another safety problem. In New Delhi, public transport is not well regulated; buses account for 2 percent of the traffic volume but are involved in 25 percent of the accidents. Law enforcement is very poor and responsibility is divided among many district-level police wings. There is no highway patrol. Education for drivers and other road users is not effective. Drivers of trucks and tractors lack proper training in traffic rules. In many road sections, unauthorized counterflow traffic is observed along the fast moving lane, often resulting in fatal accidents. Traffic signs and lane markings are inadequate.

19. Under ADB technical assistance (TA)[3] on road safety, a system for identifying black spots on NHs was devised, and an accident investigation and prevention manual for highway engineers was prepared. Following this, the Road Safety Cell was established in MORTH to collect, analyze, and interpret road accident statistics. This initiative is being continued through an ongoing World Bank-administered TA that will (i) produce a comprehensive road safety manual covering the planning, design, construction, and maintenance aspects; (ii) review the Indian Road Congress norms on road safety and recommend improvements; and (iii) draw up safety guidelines for traffic operations during road construction. The Government is also addressing road safety issues through public information campaigns and road safety education programs conducted by the road safety councils in the respective states. For the first time, the Government's Ninth FYP has a dedicated budget provision for road safety, including specific

[2] Fatality rates for Japan, United States, and Western Europe range between 2 and 6. Among ADB's developing member countries, the People's Republic of China's fatality rate is 49; Malaysia, 7; Pakistan, 33; and Sri Lanka 20.

[3] TA 2001-IND: *Road Safety,* for $210,000, approved on 29 November 1993.

allocations for engineering improvements, traffic control, wayside amenities, and highway patrolling schemes. In 1995, ADB also initiated a regional TA (RETA) on road safety,[4] covering several developing member countries including India. The RETA assessed regional initiatives in road safety and recognized that significant institutional progress had been made in India with the inclusion of road safety as a priority area for activity within the New Delhi regional infrastructure.

7. Environmental Issues

20. Since 1991, the Government has gradually intensified its control over gas emission from vehicles. First-stage control was introduced for petrol-powered vehicles in 1991 and for diesel-powered vehicles in 1992. The Government plans to introduce tougher standards, corresponding to Euro I requirements for passenger cars and commercial vehicles. Leaded fuel has been gradually phased out from metropolitan cities since 1998 with the introduction of unleaded fuel. From December 1998, commercial vehicles over 15 years of age have been banned from Delhi's center.

21. ADB has been working with the Government to address environmental issues relating to the road sector such as preventing of environmental degradation during construction and operation of highways, and controlling pollution due to urban traffic. An ADB TA[5] on environmental management prepared guidelines for highway projects; they are now used on all highway improvement and reconstruction projects in India. The guidelines ensure that ADB's environmental standards are complied with. Under ADB's Second Road Project,[6] a study of measures to control traffic pollution in urban areas was carried out. Consequently, the Central Pollution Control Board updated its regulations for mass emissions and enforced them more stringently.

B. Government Sector Objectives and Plans

22. Faced with chronic capacity shortage on major arterial links, the Government decided to undertake a radical program of upgrading key NH corridors called the National Highways Development Program (NHDP). A key component of NHDP is upgrading the golden quadrilateral, approximately 6,000 km of highway network connecting four major metropolitan areas (Delhi, Mumbai, Chennai, and Kolkata) and slated to be completed by the end of 2003. Another component is upgrading the north-south and east-west corridors, 4,000 km and 3,300 km, respectively, to be completed by the end of 2007.[7] NHDP calls for all of these corridors to be upgraded to a minimum four-lane standard. Once NHDP is implemented, the focus will shift to improving access to major ports, the Port Connectivity Project, then to construction of a national expressway network and rehabilitation of parts of the NH network that were not included in NHDP.

23. Construction costs for NHDP were estimated as approximately $13 billion. To finance the program, NHAI intends to raise $4.4 billion through a levy on petrol and diesel (para. 15), $2.7 billion through financial markets, $1.4 billion through private sector participation in the project, and the remaining $4.4 billion through external assistance. The Government's strategies include the revamping the road fund for development, issuing domestic bonds to tap the funds from India's capital markets, engaging the private sector in developing the road network, and using international and bilateral assistance.

---

[4] TA 5620-REG: *Regional Initiatives in Road Safety*, for $600,000, approved on 4 January 1995.
[5] TA 2002-IND: *Environmental Management of Road Projects,* for $240,000, approved on 29 November 1993.
[6] Loan 1041-IND: *Second Road Project*, for $250 million, approved on 30 October 1990.
[7] The original target of 2009 was recently revised to 2007.

C. External Assistance to the Sector

24. Since 1988, ADB has extended four loans totaling $873 million and 22 TAs amounting to $8.9 million to the road sector in India. Apart from ADB, the World Bank and the Japan Bank for International Cooperation (JBIC) are also involved in the road sector. The World Bank has financed nine projects amounting to about $1,900 million to construct and rehabilitate rural roads, improve state highways, and widen NHs to four lanes. JBIC has provided five loans amounting to $263 million equivalent to upgrade sections of NH2 and NH5 to four lanes and to construct a bridge across the Yamuna River at Allahabad-Naini. The World Bank has a pipeline of projects at various stages of processing. The projects include further loans for the Delhi-Kolkata corridor as well as loans for state highways in a number of states. The World Bank intends to process three loans to the transport sector each year. ADB's assistance to the road sector is well coordinated with the World Bank and JBIC through regular consultation (Supplementary Appendix C).

D. Lessons Learned

25. ADB's first loan project[8] to improve highways in the states of Andhra Pradesh, Haryana, Karnataka, Tamil Nadu, and Uttar Pradesh was completed in March 1998, while the second loan project (footnote 6) to improve national and state highways in the states of Andhra Pradesh, Karnataka, Kerala, Orissa, Rajasthan, Uttar Pradesh, and West Bengal was completed in December 1999. Both projects, which were implemented by the respective state PWDs, experienced long delays. Project completion reports (PCRs)[9] for the two projects identified two major reasons: delay in establishing a project implementation unit (PIU) and recruiting construction supervision consultants; and delay in preconstruction activities, such as land acquisition and clearance of utilities and trees due to difficulties in obtaining necessary administrative clearances from relevant authorities. The PCRs recommended taking necessary actions to redress these problems. To further expedite the implementation, the PCRs further recommended to (i) reduce the number of contract packages, thus increasing the size of each contract; (ii) strengthen the contract management capability of executing agencies (EAs); (iii) ensure acceptance by EAs of the role of the supervision consultant as the "Engineer" in accordance with Federation Internationale des Ingenieurs-Conseils (FIDIC) conditions; and (iv) use imprest account, and accord EAs direct access to the imprest account.

26. ADB's third project to improve NHs in the states of Andhra Pradesh, Bihar, Haryana, Rajasthan, and West Bengal was designed to overcome the problems experienced by the state PWDs in the earlier projects by making a specially created project unit within MORTH with responsibility for project implementation. Project implementation responsibility was to be transferred at a later date, to NHAI once it became fully functional. The number of civil works contract packages was reduced to five and made sufficiently large to attract the more experienced and better capitalized contractors. Despite these measures, the third project also experienced start-up delays. For lack of Government budgetary allocation, NHAI became fully functional only in March 1995. In addition, the award of civil works contracts was delayed because of litigation by some unsuccessful bidders. When the contracts were eventually awarded, while the entire project sites were not fully cleared of utilities and trees, NHAI ensured that sufficient work force was available to the contractors to commence work. Setting aside the start-up delays, NHAI implemented the third project well, with disbursements reaching as high as $66 million in 2000, an achievement unique for a road project. Most of the problems associated with the PWDs' projects (e.g., nonavailability and/or diversion of funds, delays in

[8] Loan 918-IND: *Road Improvement Project,* for $198 million, approved on 10 November 1988.
[9] Report numbers IN.198-99 (Aug.1999) for Loan 918-IND, and IN.266-00 (Nov. 2000) for Loan 1041-IND.

payments, delays in decision making due to bureaucratic process, lack of coordination among various agencies) were overcome by entrusting project implementation to NHAI.

27. For the Surat-Manor Tollway Project,[10] which became effective in November 2000, contracts have been awarded for both civil works packages and consulting services for construction supervision. However, contract prices for civil works have turned out to be substantially lower than the estimates. While this is partly due to the strong competition among bidders, the overestimation of the project costs appears to be another reason for the difference between the estimated and contractual prices. The costs of civil works were estimated on the basis of the Government's standard unit prices for construction.

28. In the proposed Project, careful attention has been paid to overcome the shortcomings of previous ADB projects through the following implementation arrangements: (i) start-up delays will be reduced by approving advance action for procuring civil works contracts and recruiting supervision consultants; (ii) the land acquisition process was simplified and necessary administrative authorities were delegated to designated "competent authority"; (iii) the clearance of trees and utilities from the right-of-way will be a condition for contract award; (iv) the prequalification criteria were tightened and the contract package size made large enough to attract contractors with international experience; (v) NHAI agreed to accept the role of the supervision consultants as Engineer in accordance with international best practice in contract management; and (vi) the cost estimates were based on recent bid prices offered by contractors in several NHs projects, instead of on Government's unit prices. In addition, ADB is providing advisory TA for strengthening NHAI's capability to manage contracts in accordance with FIDIC conditions.[11]

E. ADB's Sector Strategy

29. India is undertaking a huge program of highway upgrading (paras. 22 and 23) that will take 10 years at a total cost of $13 billion. The Government has requested ADB to provide a series of loans to cover part of the program. Given the potential scale of the lending, its approach should be programmatic. Projects should be developed in a sequential and progressive manner. A long-term strategy of ADB is to create an enabling environment for the efficient and sustainable development of the highway system so as to meet the needs of the public for increased mobility and efficient cargo movement. Specific ways of intervening in the road system will differ since each segment faces a different challenge.

30. The road system of India can be grouped into four segments: key NH links, other NH system, state highways and road, and rural roads. A different agency oversees each segment of the road sector: (i) NHAI, (ii) MORTH, (iii) state PWDs, and (iv) Ministry of Rural Development (MORD) (Table 1).

[10] Loan 1747-IND: *Surat-Manor Tollway Project,* for $180 million, approved on 27 July 2000.

[11] TA 3361-IND: *Capacity Building for Contract Supervision and Management in the National Highways Authority of India*, for $600,000, approved on 22 December 1999.

Segment	Coverage (%)	Traffic Carried (%)	Agency
Key national Highways (NH)	0.5	25.0	NHAI
Rest of the NH system	1.5	15.0	MORTH
State highways & roads	4.0	45.0	26 State PWDs
Rural roads	94.0	15.0	MORD & PWDs

Table 1: The Road System of India

31. The medium- to long-term objectives of ADB's operations for each segment of the highway system can be summarized as follows:

1. NHAI Segment

(i) Strengthen institutional capacity for project implementation, highway operation and maintenance (O&M), and contract management while maintaining the size of the organization small.

(ii) Further advance the public-private partnership concept.

(iii) Develop more sophisticated financial management and planning capability so as to effectively mobilize necessary funds from capital markets, both domestic and foreign.

(iv) Institute a stronger and transparent corporate governance.

(v) Transform NHAI into a more financially and managerially autonomous body that should eventually evolve into a corporatized organization.

2. MORTH Segment

(i) Separate planning and operational functions, and redefine the relationship between MORTH and PWDs.

(ii) Secure transparent and equitable management of the road fund.

(iii) Strengthen financing capability, particularly for maintenance.

(iv) Reorient MORTH from an infrastructure developing to a policy planning ministry so that it can address more effectively policy issues such as modernized trucking services, road safety, and cargo handling for facilitating transshipment from long-distance to pick-up trucks.

3. State PWDs[12] Segment

(i) Strengthen financing capability through a variety of mechanisms including state-level road funds and public-private partnership approach.

(ii) Reengineer the current institutional arrangements for road development and maintenance by redefining the role of PWDs, separating their planning and operational functions, and establishing road development corporations.

4. MORD Segment

(i) Streamline interagency relationship (MORD, PWDs, and district governments) so as to effectively plan and implement network development and maintenance.

(ii) Introduce a more objective methodology for selecting and prioritizing of rural road investments.

(iii) Institute a systematic method of maintenance with adequate budgetary support.

32. Under this programmatic approach,[13] road sector operations will be carried out as described below. The approach is schematically presented in Figure 1.

(i) Develop an overall framework for providing assistance to India's road sector.

(ii) Develop medium-term road maps for the policy and institutional reforms for each segment of the road sectors (key NHs, other NH systems, state highways/roads), and develop specific milestones that will trigger the next loan.

(iii) Under these road maps, ADB extends a series of loans to the various segments of the road subsector.

(iv) Policy dialogues will be conducted regularly to review the progress of policy and institutional reforms and assess the need for midcourse corrections to the road maps.

(v) Project processing will be much more straightforward, focusing on examining whether the milestones are implemented. Once this issue is cleared, the project processing activities will focus on examining the technical, financial, economic, environmental, and social viability of the projects.

[12] Focal states will primarily be considered, but nonfocal states will not necessarily be excluded.

[13] The approach should be distinguished from a program loan lending modality, which is essentially based on the policy reform. The above loans are essentially designed as investment projects that will be prepared just like typical highway projects, but with the policy reform elements to be implemented in a systematic, sequential, and coherent manner.

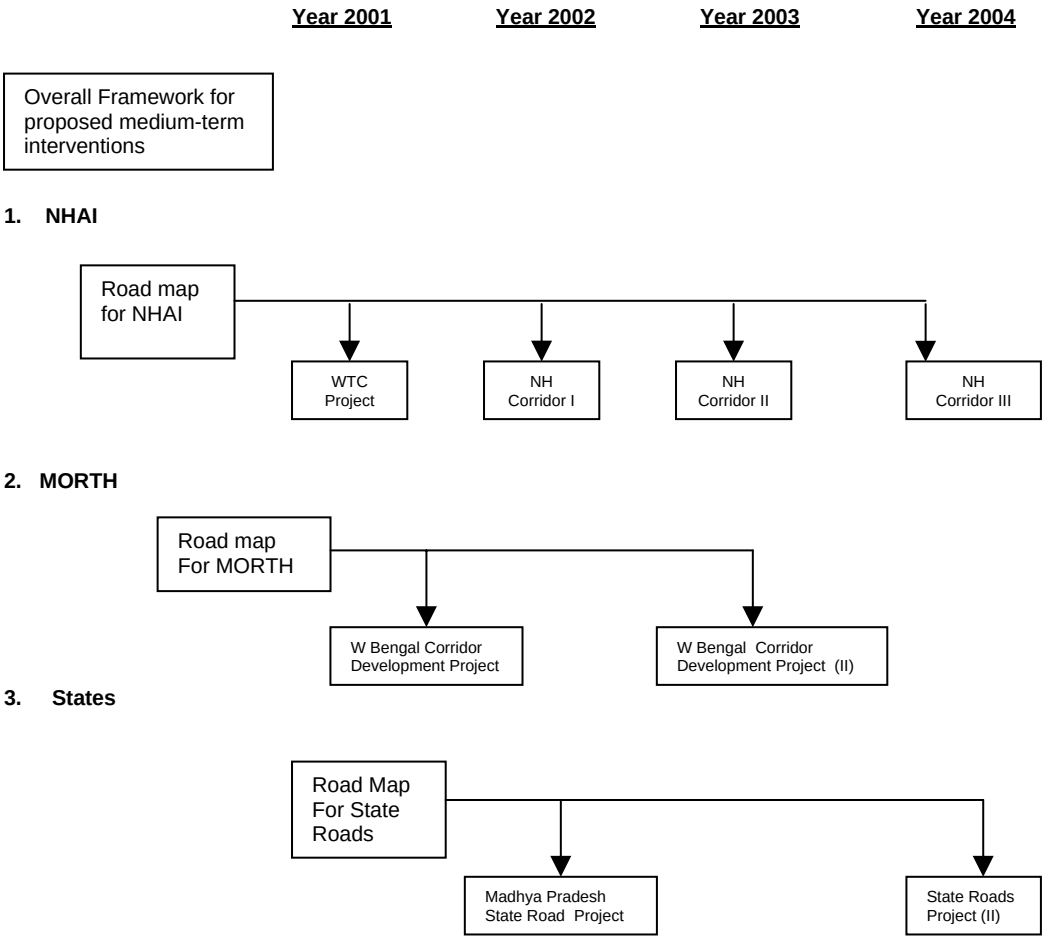


Figure 1: Diagrammatic Presentation of the Programmatic Approach

F. Policy Dialogue

33. Since 1988, ADB has been engaged in policy dialogue with the Government and providing TA programs on critical policy and institutional issues. The dialogue and related TA activities, together with coordinated efforts by the World Bank and other aid agencies, have led the Government to take a series of bold policy actions aimed at establishing an enabling environment for the sustainable development of the NH system in India. The reform actions to date can be grouped into four categories: (i) corporate governance, (ii) enhanced financing capability, (iii) improved project implementation capability, and (iv) facilitation of private sector participation. The major reform actions by the Government taken to date are listed below.

(i) Strengthened corporate governance

(a) Separating the planning and operating functions of the Government by establishing a specialized agency in charge of NH development and management (NHAI was established in 1988, became operational in 1995).

(b) Delegating broader decision-making authority to NHAI so that it can decide on individual investment and procurement without going through the lengthy process of obtaining approval from the Public Investment Board (PIB). This delegation of authority was made possible by increasing NHAI's board members to include the members of PIB such as secretaries of the Ministry of Finance (MOF), MORTH, and Planning Commission [2000].

(c) Authorizing the NHAI chairman to recruit its staff, both management and professional, without going through the usual recruitment process of government officers [1997].

(ii) Improved financing capability

(a) Revamping existing current road fund by introducing an excise duty (called "cess") levied on petrol and diesel, which is expected to generate Rs60 billion ($1.3 billion) per annum for the road sector [1998 and 1999].

(b) Approving NHAI's issuance of bonds to raise funds from domestic capital markets. Issuance was facilitated by exempting purchasers of the bonds from the capital gains tax [2000].

(c) Adopting the policy that, once a road is upgraded to a four-lane highway, the NH could charge toll, paving the way to future recovery of the construction cost of the NH system [1997].

(iii) Enhanced project implementation capacity

(a) Simplifying the century-old land acquisition procedure by amending the National Highway Act. Under this process, land acquisition will be significantly expedited and can be completed within a predictable period of time.

(b) Strengthening NHAI's capacity for dealing with environmental and social issues. A general manager in charge of environmental issues has already been assigned. In addition, ADB is providing TA to NHAI to establish a separate unit for resettlement and social development within NHAI.[14]

(iv) Increased private sector participation

(a) Issuing and implementing a policy statement, "Guideline for Private Sector Participation in the Road Infrastructure" [1997]. The guideline includes a number of critical policy actions to facilitate the build-operate-transfer (BOT) scheme, including (i) tax exemption accorded to BOT investors (100 percent income tax exemption for the first five years and 30 percent exemption for the next five years); (ii) government commitment in all preparative actions including land acquisition, right-of-way clearance, and utilities removal; (iii) NHAI's provision of a minimum amount of capital grant, in case that is needed to get a adequate numbers of contractors to bid for a project; (iv) foreign direct investments with up to

[14] TA 3365-IND: *Capacity Building for Social Development*, for $800,000, approved on 23 December 1999.

100 percent equity participation; and (v) duty-free import of modern high-performance construction equipment.

(b) Amending the National Highway Act, authorizing private sector investors to operate a part of the NH system and collect tolls under the Government's concession scheme [1997].

34. As seen above, significant progress has been made on major policy and institutional fronts, but a number of areas remain to be addressed. They include (i) establishing a medium- to long-term goal for NHAI, (ii) instituting more efficient highway maintenance systems, (iii) enhancing of the financing capability of NHAI, (iv) enhancing road safety, and (v) modernizing road freight services.

(i) Establishment of a clear medium- to long-term strategic framework for NHAI. NHAI is still in a transitional stage. Starting with a dozen staff and a capital of Rs7 billion in 1995, it has grown into an organization with 350 staff handling more than Rs60 billion per year. Its operations are expected to further expand and become more complicated due to the introduction of alternative financing mechanisms and the increased participation of the private sector. Despite these changes, its basic way of doing business is still essentially based on the traditional "agency system" that had primarily been developed decades ago for entrusting civil works of the Central Government to state PWDs. NHAI receives project management fees (3 percent of the costs of the externally assisted projects, and 9 percent for other projects) in return for its execution of the entrusted civil works. Beside this, NHAI does not have its own source of revenue. It does not retain the tolls it collects, which are to be deposited to the consolidated account of the Central Government (highways are not NHAI's assets). This arrangement not only gives little incentive to NHAI for cost-effective highway construction, but also makes it difficult for NHAI to transform itself into a more independent entity that could mobilize the funds from the capital markets in a more sustainable and cost-effective manner. Entering into the new phase of evolution, NHAI should set out a medium- to long-term vision of its eventual goal. The proposed Project has incorporated a component designed to facilitate policy dialogue with the Government on the most appropriate form of the organization, and how NHAI is to be transformed into that new form.

(ii) Instituting more efficient highway operation and maintenance systems. This is a relatively new area to NHAI. With increased highway assets available for service, O&M are becoming an increasingly important area. Given the limited human resources in NHAI, the most effective way of carrying out this function is contracting it out to the private sector. The previously approved Loan 1747-IND (footnote 10) has incorporated this concept. The proposed Project is to further advance this approach by incorporating an asset management concept (i.e., CMU) as detailed in para. 17.

(iii) Enhancing the financing capability of NHAI. Recently NHAI decided to involve the private sector in BOT schemes, but many of these will be viable only if a grant or annuity is offered to the private sector.[15] NHAI has also raised funds from the capital markets through bond issues made possible only by exempting the purchasers from the capital gains tax. This tax exemption status is less likely to be repeated in subsequent bond issues. Given the envisaged scale of fund

[15] Bridge or bypass or short section developments were made without offering grants and annuities.

mobilization through capital markets and also from the private sector, NHAI has to further strengthen its financing capability and diversify its financing schemes. The proposed Project will assist NHAI with diversified and sophisticated financing instruments including securitization of future revenue flow.

(iv) Advancing public-private partnership (PPP). Given the multi-purpose nature of NH systems in India, which entail both public and private goods elements, they should be developed through the participation of the public and private sectors. In this PPP approach, the Government does not pay more than the public goods component. The current arrangement that the Government adopted for the BOT highway projects presents an effective mechanism since bidders for a BOT project compete with each other for the amount of the grant (either positive or negative), and the results of bidding will be a good indication of the optimum balance of the public and private goods elements. It was, therefore, agreed to review the experience of the BOT operations during the Project midterm review currently scheduled for May 2003.

(v) Enhancing road safety. India has one of the highest traffic accident rates in Asia due to a number of factors, including inadequate enforcement of safety regulations, ineffective vehicle inspection system, and inadequate safety training. The most serious factor is the mixture of fast-moving and slow-moving traffic and uncontrolled pedestrian crossing. The proposed Project will address this problem by establishing a continual median to prevent counterflow traffic, separating fast and slow traffic, and providing underpasses and overpasses to enable pedestrians to cross roads.

.

(vi) Modernizing road freight services. The upgraded NH system is designed for an operating speed of 100 km per hour. However, trucks currently run at a speed of 40-50 km, particularly when carrying heavy-duty cargoes such as containers. Unless trucking services are modernized, the full benefits of the upgraded highway network will not be realized. A policy for the modernization of the trucking services, particularly those for intermodal operation, should be developed and implemented. ADB and MORTH agreed to address this issue in future ADB activities.

35. These policy and institutional issues will be addressed in close cooperation with the World Bank as has been done in the last several years.

IV. THE PROPOSED PROJECT

A. Rationale

36. India's highway sector has long suffered from lack of funding, weak project implementation capability, poor policy coordination, and delays in decision making. Launching an unprecedented scale of a national highway development, the Government decided to address these decade-old institutional problems and issues. The Government has already taken actions to boost the source of funds for highway development and facilitate private sector participation in highway development and maintenance to fill up some of the financing gap needed for NHDP development. While these actions have significantly contributed to resolving the problems, even more fundamental challenges remain. They include introducing more sophisticated financial instruments, diversifying methods involving the private sector, and enhancing the financial and managerial autonomy of NHAI with the eventual goal of corporatization. These challenges cannot be met by a one-time intervention; they require

consistent and repeated interventions. ADB envisages launching a new initiative to address these issues from a longer term perspective by undertaking a sequential and progressive approach for future lending in this subsector.

37. Aside from the longer term challenges, the Government is facing the immediate challenge of upgrading key arterial corridors, particularly the golden quadrilateral (GQ). The western transport corridor (WTC) is the busiest part of the GQ, passing through Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu states. Constructing an efficient, continuous transport linkage throughout the WTC will have a significant impact on overall economic growth and also allow benefits from recent economic growth to spread to the poorer areas. The Surat-Manor Tollway Project (footnote 10) was the first loan ADB has provided to assist the upgrading of GQ. The proposed Project is the second in the series of assistance for upgrading GQ.

38. Given the higher traffic volume in the WTC than in other parts of the GQ, the WTC was chosen to experiment a concept of public-private partnership. A development strategy was developed under ADB's Project Preparatory TA.[16] The WTC development plan identified that approximately 24 percent of the sections of WTC were viable as projects using private sector funding of some form. The remaining 76 percent not found viable for private sector funding need public sector funding (Appendix 3). Two sections were identified as pilot projects: (i) Jaipur bypass project using PPP funds, and (ii) Tumkur-Haveri project using public sector financing. For the Jaipur bypass project, ADB provided TA to enable NHAI to proceed with a PPP approach,

39. For the publicly funded portion, ADB proposes to extend financial assistance to upgrade the Tumkur-Haveri section of NH4. This Project was designed to incorporate a number of road safety features such as median separation, service roads, bypass, underpasses, overpasses, and fencing. These features are unprecedented elsewhere on the GQ to date and will act as a model for safety awareness in designs of similar highways in India's highway sector.

B. Objectives and Scope

40. The Project aims to advance policy reforms in India to create an enabling environment for the sustainable development of NH systems with substantial participation of the private sector. The policy framework (Appendix 4), together with a time-bound action plan, was developed and agreed upon with the Government. It will serve as a road map for future lending operations to the NH subsector in India (para. 32).

41. Under this overall framework, the proposed Project was designed to achieve four specific objectives: (i) remove capacity constraints on a critical section of the Project highway; (ii) enhance road safety by introducing design features that will reduce traffic accidents and minimize negative impacts of road construction for people within the Project highway; (iii) enhance corporate finance capability of NHAI to facilitate its eventual transition to an efficiently managed autonomous entity, including possible corporatization; and (iv) increase private sector participation in the development and O&M of the NH systems.

[16] TA 2986-IND: *Western Transport Corridor – Facilitating Private Participation*, for $1 million, approved on 9 February 1998.

42. To realize the specific objectives, the Project includes investment, capacity-building, and project implementation support components. The investment components will

(i) upgrade the existing two-lane single-carriageway highway to a four-lane divided highway in the Tumkur-Haveri section of about 259 km on NH4;[17] and

(ii) enhance road safety by incorporating several design features: a divided carriageway designed to prevent head-on collisions, service roads to separate slow-moving and fast-moving traffic, enlarged cross-culverts to facilitate road crossing of pedestrians and farm traffic, overbridges for the same purpose, bypasses to separate through traffic from locally originated and destined traffic, and fences to prevent unlawful crossing and minimize noise pollution in populated areas.

The capacity building components will

(i) enhance the corporate finance capability of NHAI by (a) facilitating capital mobilization by securitizing future revenue and issuing bonds; (b) enhancing the treasury function so as to maximize the yield to be raised from the available funds; (c) improving the financial reporting system so that potential investors can make well-informed decisions; and (d) facilitating the transition of NHAI into a more efficiently managed autonomous body such as a corporatized organization, by comparing the relative merits of existing and alternative forms of organizations and developing a strategy for transforming the NHAI;

(ii) commercialize O&M for the Project section of NH4 by offering the O&M functions as concession to the private sector together with consulting services for (a) developing O&M tender documents for a private concessionaire, specifically designed for the Tumkur-Haveri section in line with the corridor management unit concept; and (b) providing assistance in bid evaluation and negotiation with a successful bidder;

(iii) conduct safety audit to learn from experience during construction and implementation; and

(iv) establish a more rationally structured tolling system and increase public acceptance of tolls through effective public campaigns.

The last three activities are being funded under the ongoing Surat-Manor Tollway Project (footnote 10) (see para. 68).

The project implementation support components will

(i) provide construction supervision services for the investment components; and

(ii) provide environmental impact management training to staff of NHAI, contractors, and supervision consultants.

[17] Project road is between Km 75 (Tumkur) and Km 340 (Haveri) with exclusion of a bypass to Sira Town between Km 116 and Km 122.

1. Investment Components

43. **Upgrading Highways.** The Project will rehabilitate the existing highway and widen the entire section to a four-lane divided highway. Of the total project length of 259 km, 18.3 km will be a new four-lane divided highway to avoid congested urban areas and to minimize the impact on property and buildings, 2.7 km will be a new four-lane divided highway to realign a short length of highway with substandard geometry, and 5.5 km will be a two-lane single carriageway to relieve the existing Hariyur bypass. The design speed will be 100 km/hour, but a reduced design speed of 80 km/hr will be adopted for the Harihar and Chitradurga bypasses due to right-of-way constraints. Traffic loading for pavement design was derived from traffic projections generated during the economic analysis of the project together with field investigation work. In a significant departure from the usual Indian practice, the existing pavement will not be retained but will be milled off and reused in the lower layers of new pavement construction. This change is justified after evidence from previous NHAI projects raised questions as to the integrity of structural overlays on old pavements that have a complex history of widening and overlaying. Pavement designs for both reconstructed and new pavements were based on a 15-year life.

44. **Enhancing Road Safety.** The design of the upgrading works contains a number of elements that are novel in Indian highway construction. During the design stage, a significant effort was made to incorporate features that will (i) enhance safety for the user, and (ii) minimize disruption to communities through which the highway passes. Examples of the safety features are the adoption of limited access, in which traffic can only join the highway at interchanges via 21 grade separated interchanges at major junctions and 13 at-grade junctions for minor roads; fencing to control pedestrian access; and service roads to separate local traffic from high-speed, long-distance traffic. Major highways can become an impenetrable barrier to local communities through which the highway passes. To mitigate the inconvenience to local people and allow passage of agricultural vehicles and animals, overpasses and underpasses will be provided at 63 locations. The overpasses and underpasses will not be connected to the main highway and thus will allow safe passage of local traffic without introducing conflict with the high-speed, long-distance traffic. Where minor local roads run up to the main highway, service roads will lead local traffic to one of the major interchanges or junctions. As individual features, none of the preceding are completely new to India, but the extent and number that have been incorporated in this Project are unprecedented.

2. Capacity-Building Components

45. **Enhancing Corporate Finance Capability.** To maximize the value of the revamped road fund, the Government recently decided that it will use the fund not only for paying the construction costs but also for serving debts incurred or to be incurred by bond issues. This will enable NHAI to raise approximately six times more funds from markets with the use of the same amount of the cess money, but this will also require NHAI to mobilize funds from capital markets in a more aggressive manner (i.e., larger scale and better term). To do that, NHAI must be equipped with more sophisticated financial management and planning capabilities, particularly those for bond issues.

46. NHAI has already started this process by issuing seven-year domestic bonds with a put/call option after three years. The first issue in 2000 raised Rs5 billion ($111 million). The second bonds were issued in February 2001 as an on-tap issue. Both issues carry a triple A rating by virtue of their implicit government guarantee. There are plans to raise approximately Rs120 billion ($2.5 billion) through a series of bond issues, but this is likely to exceed the absorptive capacity of the domestic bond markets and will crowd out other institutions from Indian bond markets. Unless NHAI mobilizes funds from foreign capital markets, the current financing strategy will not be sustainable. Although NHAI has not yet considered issuing bonds

in foreign capital markets, it has to take a serious look at this possibility. That undertaking will require NHAI to disclose more financial information to the public so that potential investors can make better informed decisions.

47. Although this direct borrowing will bring a significant amount of funds to NHAI, these will not be sufficient to implement the huge tasks mandated by the Government. It will be necessary for NHAI to develop alternative financial instruments. Beside the usual BOT schemes (which NHAI has already been pursuing), securitizing the future toll revenue is also to be explored. NHAI has already established several special-purpose vehicles (SPVs) for the construction of highway links connecting to major traffic generators such as ports. It plans to sell its shares in these companies once SPVs demonstrate their revenue-generating capability. Initial public offer of these stocks should be made under an overall strategic plan.

48. These changes call for NHAI to be equipped with sophisticated financial instruments. The current form of the organization (an operational arm of the Government specializing in highway development and maintenance) will not necessarily be best for this purpose. NHAI should begin to examine an alternative form of organization from a more strategic and longer term perspective. Policy dialogue should be initiated with the aim of forming a consensus among key stakeholders on the future direction of NHAI.

49. As a tool to carry out policy dialogue with the Government, TA is proposed to enhance the corporate finance capability of NHAI. The proposed TA will be carried out in two stages.

50. The first stage activities are designed to meet NHAI's immediate need to strengthen its capacity in the area of finance. More specifically, they will consist of support for (i) capital mobilization, (ii) the treasury function, and (iii) a financial reporting system.

(i) Support for capital mobilization will enable NHAI to develop a general strategy for financing road investments and evaluating alternative financial instruments both currently available and realizable in the medium term. The financial instruments that NHAI currently considers are special-purpose vehicles (SPV), bond financing, and other forms of securitization. The relative costs for these instruments will be determined and the potential size of the market for them estimated. Also the available mechanisms for credit enhancement will be explored including different forms of third-party guarantees. Criteria and analytical procedures for matching road projects and financing options will be developed considering explicit objectives. Specific implementation plans will be developed for each specific opportunity, together with the timetable for implementation.

(ii) Support for the treasury function aims to strengthen that function. Current practices in collecting tolls, revenues, and payments for construction, service contracts, and debt service will be reviewed to ensure reliability in meeting obligations. This component will also develop a strategy for funds placement to maximize yield while ensuring adequate liquidity. Performance measures will be developed to monitor the effectiveness of funds placement. A financial planning model will be developed in which alternative investment options will be evaluated along with the projected cash flows related to construction activities, debt service, Government grants, cess revenues, and operating revenues and expenditures. The model will be used to evaluate allocation of funds in terms of liquidity and return.

(iii) Support for financial reporting will enable NHAI to restructure its financial and accounting reporting system to provide the information required to reinforce efforts to raise financing in the capital markets, both domestically and internationally.

Accounting policies and standards should evolve as the financing operations of NHAI become sophisticated. Thus, the consultant must develop a series of recommendations to enable NHAI to shift from current accounting practices to those consistent with Generally Accepted Accounting Practices of India (GAAP-I), and, then, to international accounting standards (IAS) (para. 71 gives a more detailed discussion of NHAI's accounting policies and practices). Transition from the traditional accounting system to those more commercially oriented ones requires extensive capacity building exercises for NHAI staff. Consultants will provide the necessary training.

51. The above activities will be preceded by a review of the current legal framework associated with ownership of NHs (including the difference between entrusted, vested, leased, or owned. The activities will be supplemented by training for NHAI's staff in financial modeling exercises, and regional study tours to countries such as the People's Republic of China that have introduced different models of securitization and raising of funds from the capital markets.

52. The second-stage activities will focus on policy dialogues on the broader and longer term issues with the active participation of relevant Government ministries and the World Bank. A major topic will be the future form of the organization, with emphasis on how to transform NHAI into a financially and managerially autonomous body such as a corporatized organization. The main activities follow:

(i) review the results/progress of the World Bank study on institutional development;

(ii) review the experiences of other countries with regard to forms of organizations that provide infrastructure through the public sector operating arm;

(iii) select possible alternative forms of organization and apply the strategic financial planning model to compare the existing and alternative forms in terms of financial performance;

(iv) develop a strategy for transforming NHAI into an efficiently managed and financially/managerially autonomous body; and

(v) hold a series of workshops on the future form of NHAI, with the participation of relevant agencies and the World Bank .

53. The activities wIll be carried out in coordination with the World Bank, which is currently assisting NHAI in institutional strengthening within the existing framework of the organization. The ADB proposal will be carried out under a TA to be processed in conjunction with the Project.

54. **Commercializing O&M.** The commercialization concept was originally incorporated in the Surat-Manor Project, which is expected to be completed in 2003. During processing of the WTC Project, it was decided to make this concept consistent with the corridor management unit approach, which was developed and will be tested under the World Bank-financed Third National Highway Project. It was further decided to engage one consulting firm for both the Surat Manor Project and the WTC Project to ensure the consistency of concession agreements in both projects. An outline paper for O&M concession (Supplementary Appendix D) has been prepared for the consulting services that will develop O&M tender documents for a private sector concessionaire including a concession agreement, and assist in bid evaluation and negotiation with a successful bidder.

55. **Conducting Safety Audit.** At various stages of the Project, a safety audit will be carried out to learn from experiences during construction and implementation. Lessons learned will be applied to future construction and improvement along the WTC (Supplementary Appendix E).

56. **Toll System Study**. As the national highway network expands, an increasing number of tollbooths will be established along the highways to be managed by NHAI. To date, however, the locations of tollbooths have been determined in a rather adhoc manner. As a results, highway users feel frustrated because of the lack of conceptually acceptable tolling systems. The basic regime of the current tolls was set based on a willingness-to-pay survey, but the current level of tolls does not necessarily reflect that basis. They are too low to generate the level of funds necessary for the continuous development of the national highway system. Thus, a rationally structured toll system needs to be instituted. Alternative pricing strategies should also be developed. The proposed study will address those issues. Another important element of the tolling system is the perception of tolls by the public that is not yet used to the concept of paying for the use of highways. Public campaigns aimed at increased acceptance of tolls will be a strategic action to take for successful tolling operations for the national highway system. A public campaign strategy will be developed and implemented through this TA with use of experts of extensive knowledge and experience in public campaigning. The summary terms of reference (TOR) is in Supplementary Appendix F.

3. Project Implementation Support Components

57. **Construction Supervision.** To enhance the efficiency and quality of construction works, two consulting firms will be engaged to supervise the construction of the project road (the TOR is in Supplementary Appendix G). The consultants will undertake the role of engineer as set out in the FIDIC conditions of contract, as would normally be the case for a major internationally funded project.

58. **Environmental Management Training**. To strengthen the capacity for environmental management, NHAI will receive funds for training in environmental management. Trainees will be contractors, supervision consultants, and NHAI environment officers in charge of this Project and the Surat-Manor Project (Supplementary Appendix H).

C. Cost Estimates

59. The total cost of the Project is estimated at $378.0 million equivalent, including allowances for contingencies and interest during construction. The foreign exchange cost is estimated at $240.0 million, representing 63.5 percent of the total cost, while the local currency cost is estimated at $138.0 million equivalent, representing 36.5 percent (Table 2 and Appendix 5).

Table 2: Project Cost Estimates
($ million)

Item		Foreign Currency	Local Currency	Total
A.	**Base Cost (in October 2000 prices)**			
	1. Right-of-Way	-	10.6	10.6
	2. Civil Works	179.8	101.2	281.0
	3. Resettlement	-	5.8	5.8
	4. Consulting Services	14.0	-	14.0
	5. Project Management	-	5.6	5.6
	Subtotal	**193.8**	**123.3**	**317.1**
B.	**Contingencies**	**23.7**	**14.7**	**38.4**
C.	**Front-end Fee**	**2.4**	**-**	**2.4**
D.	**Interest/Commitment Charges During Construction**	**20.1**	**-**	**20.1**
	Total	**240.0**	**138.0**	**378.0**

D. Financing Plan

60. The Government of India has requested a loan of $240.0 million from ADB's ordinary capital resources to help finance the Project. The loan will have a 25-year term, including a grace period of 5 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75 percent per annum, a front-end fee of 1.0 percent (the front-end fee will be capitalized in the loan), conversions options that may be exercised in accordance with the terms of the draft Loan Agreement, the Loan Regulations, and ADB's Conversion Guidelines, and such other terms and conditions set forth in the draft Loan Agreement. The Government has provided ADB with (i) the reasons for the Government's decision to borrow under ADB's LIBOR-based lending facility on the basis of these terms and conditions, and (ii) an undertaking that these choices were the Government's own independent decision and not made in reliance on any communication or advice of ADB. The remaining project cost of $138.0 million equivalent in local currency costs will be covered by the Government (Table 3). The proceeds of the loan will be made available by the Government to NHAI promptly as required for the purposes of the Project. The Government's current policy of assistance to NHAI in this regard is a loan-grant ration of 20:80. The Government will bear the foreign exchange risk of the loan.

Table 3: Financing Plan
($ million)

Source	Foreign Currency	Local Currency	Total Cost	Percentage
Asian Development Bank	240.0	-	240.0	63.5
Government	-	138.0	138.0	36.5
Total	**240.0**	**138.0**	**378.0**	**100.0**

E. Implementation Arrangements

1. Project Management

61. NHAI will be the Executing Agency for the Project. The Project will be implemented by a specially created project implementation unit (PIU), which will be located in Chitradugra, a town between Tumkur and Haveri. A general manager level staff will be assigned as project director, assisted by five deputy general managers or managers, each responsible for one contract package. The activities of the PIU will be overseen by the chairperson of NHAI who will be assisted by a chief general manager in charge of NH4 development. Sufficient administrative authority will be delegated to the PIU for effective and timely decision making on project implementation matters. Appendix 6 gives the organization structure of PIU.

62. Given the length of Project roads, NHAI decided to engage two consulting firms to ensure adequate construction supervision. One firm will look after three contracts located between Tumkur and Chirtradugra, and, the other firm two contracts between Chitradugra and Haveri. The two consulting firms will act as Engineers for the Project. It was agreed with NHAI to significantly expand the power of the "Engineer" so as to ensure a more objective and transparent processing of contract variations.

2. Implementation Schedule

63. The Project will be implemented over 48 months, inclusive of procurement and preconstruction activities (Supplementary Appendix I). It is expected to be completed by 30 June 2005. The schedule will allow for land acquisition and resettlement activities and the clearance of all utilities, trees, and any other obstructions from the land to be used for construction activities.

3. Procurement

64. Civil works will be procured in accordance with ADB's *Guidelines for Procurement,* following international competitive bidding procedures. ADB has approved NHAI's request to divide civil works into five packages. The contract packages are large enough to attract capable contractors with international experience (the packages range from $27 million to $84 million). It was also agreed that NHAI will not award any civil works contract until (i) the land and rights to land required for the Project have been acquired; and (ii) utilities, trees, and any other obstruction from the land to be used for construction activities relating to the contract have been cleared. The contract packages and the mode of procurement are in Appendix 7.

65. To expedite the process, ADB approved advance procurement action on 9 November 2000 for prequalification, and on 3 January 2001 for subsequent procurement actions except for the signing of contracts. Based on these actions, prequalification documents were approved on 24 November 2000, and bidding documents on 9 April 2001. NHAI was advised that approval of advance procurement does not commit ADB to finance the Project.

4. Consulting Services

66. Consulting services will be required for (i) construction supervision, (ii) training for environmental management, (iii) award of O&M services to concessionaires, (iv) toll system study, and (v) safety audit. Consultants for these services will be engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for engagement of domestic consultants.

67. For construction supervision, two teams of consultants, comprising both international and domestic experts will be engaged. Staffing inputs will be 2,630 person-months (around 480 for international and 2,150 for domestic) with an estimated cost of approximately $14.0 million. On 3 January 2001 ADB approved advance action for engaging these construction supervision consultants on the understanding that such approval does not commit ADB to finance the Project. Invitation documents for construction supervision consultants were approved on 11 June 2001. For environmental management training, one international and three domestic consultants will be engaged. The estimated cost of this activity is $40,000. NHAI will send the TOR for consulting services to ADB for approval.

68. For the consulting services for (i) award of O&M operations to concessionaires, (ii) safety audit, and (iii) toll collection system study, loan proceeds of the Surat-Manor Project (Loan 1747-IND) (footnote 10) will be used since these activities were originally included in Loan 1747-IND, but need to be implemented with a broader scope. NHAI will submit the TOR for these consulting services to ADB for approval.

5. Disbursement

69. The loan proceeds will be disbursed in accordance with *ADB's Loan Disbursement Handbook* dated January 2001, as amended from time to time, and direct payment procedures will be used for disbursement of payments. To facilitate the implementation of the Project through the timely release of funds, an imprest account may be established by the Government with the Reserve Bank of India for the Project. The imprest account will be managed, replenished, and liquidated in accordance with the above Loan Disbursement Handbook. The initial amount to be deposited in the imprest account is not to exceed 10 percent of the loan amount. Any individual payment to be reimbursed or liquidated under the statement of expenditures (SOE) method for reimbursement of certain eligible expenditures will not exceed the equivalent of $100,000.

6. Records and Accounts

70. NHAI will maintain separate records and accounts adequate to identify works, goods and services financed from the loan proceeds, the financing resources received, the expenditures incurred for the Project, and local funds. The project accounts will be set up in accordance with sound accounting principles (Supplementary Appendix J gives the detailed financial management system).

71. NHAI uses accrual accounting, and transactions are recorded on a historical cost basis. The financial statements are in a format prescribed by the Government, and are audited annually by the Controller and Auditor General of India (CAG). CAG requires NHAI to prepare a balance sheet and a profit and loss statement. At present, NHAI acts as an agent of the Government for the purpose of developing NHs. Accordingly, NHAI does not own the road infrastructure assets. On the balance sheet, road construction expenditure is shown as work in progress, but there is no accounting policy for retaining these assets on the books once they are completed. Toll revenues are not currently treated as NHAI income, but as accounts payable (to the Government). NHAI's main source of reported revenue is the management fee received from the Government in return for completing the entrusted works. As long as NHAI accounts are prepared according to government requirements, they will differ from international accounting practices. As NHAI's financing activities are sophisticated, its accounting policies and standards need to be upgraded in stages. A road map for modernizing of NHAI's accounting policies and practices was agreed upon during loan negotiations (Appendix 8). To facilitate implementation of the road map, it was agreed to provide TA for modernizing the financial reporting system (para. 50).

72. An independent auditor satisfactory to ADB will audit annually the project accounts and the financial statements of NHAI. The audited accounts and financial statements will be submitted to ADB not later than six months after the end of the fiscal year to which they relate.

7. Project Supervision

73. A project inception mission will be fielded soon after effectiveness of the proposed Project to initiate the implementation process. ADB staff will review the project progress annually. In addition to the regular review, a detailed midterm review will be carried out around May 2003. One item to be assessed is the results of BOT projects along the western transport corridor to identify appropriate models for private-public partnership arrangements. If the midterm review indicates implementation problems, NHAI and ADB will agree on appropriate measures, including changes in implementation arrangements, to ensure that the project objectives are met.

8. Progress Reports and Project Benefit Monitoring

74. To monitor execution of the Project, NHAI will submit to ADB quarterly progress reports on implementation status. The reports will be based on the monthly and quarterly reports that supervision consultants submit to NHAI. Within three months of the physical completion of the Project, NHAI will submit to ADB a project completion report covering details of implementation costs and benefit monitoring and evaluation activities.

75. With the assistance of the supervision consultants, NHAI will undertake project performance monitoring and evaluation in accordance with ADB's *Project Performance Management System Handbook*. The performance monitoring indicators (PMIs) agreed upon with NHAI include

(i) volume/capacity ratio of the project road, for measuring capacity expansion;

(ii) travel time, for measuring increased efficiency of passenger transport;

(iii) traffic fatalities, for measuring increased road safety; and

(iv) length of the sections (a) to be developed, and (b) to be operated and maintained by the private sector along the WTC, for measuring the extent of private sector participation.

76. Initial values and target values for each PMI, together with the methodologies for compiling the date, are presented in Supplementary Appendix K.

F. Executing Agency

77. NHAI was set up under the National Highway Authority of India Act, 1988 (the NHAI Act). Before this Act, the NH network had mostly been developed through the "agency system" in which civil works of the Central Government were delegated to state PWDs. However, this system did not work well since the Central Government did not have direct control over state PWDs and could not ensure the timely delivery of projects. Furthermore, in several cases the Central Government had to defend itself before Parliament for acts of omission by PWD staff over which the Central Government agency did not have administrative control. These problems led the Central Government to establish its own operational arm under the oversight of the Ministry of Surface Transport, a predecessor of MORTH.

78. The NHAI Act was enacted in 1988, but NHAI became operational only in 1995. NHAI is managed by a board comprising a chairperson reporting to MORTH, five full-time members, and four part-time members, all Government appointees. Its employees are public servants. The organization has 200 managerial and professional staff and 150 supporting staff. The organization chart of NHAI is shown in Supplementary Appendix L.

79. NHAI has responsibilities to develop, operate, and maintain the NH network and other facilities entrusted in it by MORTH. NHAI's immediate mandate is to execute NHDP either by itself or through the use of the private sector. It is also responsible for developing and maintaining a dozen road links connecting ports and other key industrial centers. To carry out these activities, NHAI has established several divisions, including those for implementing World Bank, ADB, private sector, and its own projects. It conducts project development activities, including identifying and formulating projects, feasibility studies, land acquisition, preconstruction clearances of utilities and trees, and environmental protection.

80. NHAI has limited revenues and is largely dependent on capital grants from the Government for its highway development program. It has also received maintenance grants from MORTH of around Rs1 billion. However, the NHAI Act states that it should act on business principles. NHAI may (i) "invest funds in the securities of the Government or in such other manner as may be prescribed," (ii) "borrow money from any source by the issuance of bonds, debentures, and other instruments as it may deem fit with the consent of the central Government." NHAI's recent financial statements are shown in Appendix 9.

G. Social and Environmental Impacts

81. A social and environmental screening survey was carried out during the project feasibility study. Participatory processes were applied; project affected peoples, local community leaders, village *panchayat* heads, state officials, and a sample of persons in the project influence area were consulted about the proposed highway improvements. The communities were supportive of the Project owing to the significant economic benefits to be generated by highway improvement, and also because of the design features to maximize the positive impact of highway improvement on the local communities. The Project is expected to benefit the local population by reducing the number of traffic accidents, which is significantly higher in Karnataka State than the national average.

82. Underpasses and overpasses will facilitate safe crossing of pedestrians and cyclists. Fencing is expected to minimize accidents including those associated with these road users. NHAI will construct parallel service roads for local access. Bus stands and truck parking areas will be developed at appropriate sites to facilitate rest and recreation during travel. Shops and concessionaire facilities to be established at these spots will provide additional income-generating opportunities to the local people. Project-affected persons will have first priority for operating food and other services. Road users will benefit from increased comfort, safety, and reduced travel time. Perceived negative impacts are related to noise. Fences at both sides of the highway will trap the vehicle noise.

1. Environmental Impacts

83. The Project is in environmental category B. NHAI consultants prepared an initial environmental examination (IEE) during the feasibility study stage for the Tumkur-Harihar and also for the Harihar-Haveri sections. The IEE indicates that the Project will not cause any significant adverse environmental impacts as the proposed highway improvements will not involve any realignment or major earthworks. There will be no disturbance to cultural/heritage areas, protected areas, wetlands, or other environmentally sensitive areas. A summary IEE was

prepared and submitted to ADB (Appendix 10). The Project will comply with ADB's *Environmental Guidelines for Selected Infrastructure Development Projects* of 1993 and also with the *Environmental Assessment Requirements of the Asian Development Bank*, 1998.

84. An environmental management action plan (EMAP) was prepared for NHAI and contractors to follow to minimize potential environmental impacts. The EMAP summarized the mitigation proposals and allocated the responsibility for implementing, testing, and monitoring during the construction phase and the first five years of the operation phase of the Project. It was also agreed that ADB will finance the cost of environmental management training under the proposed Project.

2. Resettlement

85. A draft Resettlement Action Plan (RAP) was submitted to ADB (summary in Appendix 11). According to the RAP and the subsequently provided information, the Project will acquire 1,601 acres of land, of which 1,341 acres is agricultural land, 173 acres is nonagricultural land, and the remaining 87 acres are government land. Land acquisition will affect an estimated 18,906 persons. However, because of strip acquisition, impacts are not expected to be significant. Compensation will be paid at replacement value. The Project will carry out resettlement in accordance with ADB's policy on involuntary resettlement and its *Handbook on Resettlement*, 1998, as amended from time to time. Land acquisition will impact a total of 541 privately owned structures and affect 3,246 persons. NHAI indicated that no relocation sites were required for housing as all affected persons wished to self-relocate.

86. Acquisition of structures will affect 310 families and 1,860 persons without formal title to land. Informal dwellers, both in residences and shops, will be compensated for lost assets at replacement cost and shifting assistance, and will be entitled to training if they choose to enroll. They will be allowed to relocate as close as possible to their present location. The PIU will develop a vendors' market if more than 50 shopkeepers are affected. They will be allowed to occupy the market rent-free for the first six months. Detailed arrangements will be worked out during implementation and from discussions with the vendors themselves. Encroachers who are private owners but have encroached on government land will be notified to remove their structures before civil works commence and allowed to salvage materials from the demolished structures. Vulnerable families in this category will be assisted on a case-by-case basis to improve their incomes, and compensated at replacement cost for their lost assets. Public utilities such as water tanks, bore wells, and water pumps; public buildings such as schools and hospitals; common property resources; and boundary walls will be affected. The original alignment design was altered to minimize negative impacts, particularly land acquisition and resettlement; bypasses will be constructed to avoid heavily populated areas.

87. NHAI confirmed that a summary of the draft resettlement plan (RP) has already been disclosed. Affected persons have been given one month to respond with comments. Responses received and changes incorporated will be reviewed. The final RP will be translated into Kannada and made available at the commissioner's office in each district. The executive summary, entitlement matrix, budget, and TORs for the Implementing Agency and monitoring agency will be translated and distributed at panchayat offices. To avoid an influx of informal dwellers and fraudulent claims during implementation, NHAI issued photo identification cards to all squatter occupants in March 2001.

88. It was agreed that the NHAI will establish a resettlement unit (RU) to be headed by the Project Director in charge of resettlement. The Project Director will be assisted by four resettlement officers who will be appointed to supervise local-level implementation, each looking after a project district. To the extent possible, 50 percent of personnel engaged from

nongovernment organizations (NGOs) to assist in the resettlement offices will be women. The PIU and RU will be trained under the ongoing ADB TA for Capacity Building for Social Development (footnote 14).

H. Technical Assistance

89. In conjunction with the Project, TA will be provided for implementing the proposed component for enhancing corporate finance capacity of NHAI (paras. 45–53). The estimated cost of the TA is $900,000, of which ADB will finance $700,000 from the ADB-funded TA Program, and the remainder will be financed by the Government. The TA consultants will be recruited in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for engaging domestic consultants. The Executing Agency for the TA will be NHAI. The TOR for the TA and costing for consulting services are presented in Appendix 12.

V. PROJECT JUSTIFICATION

A. Financial and Economic Analyses

1. Financial Analysis

90. The completed project highway will be operated as a toll concession. The financial internal rate of return (FIRR) was calculated on the basis of the project capital costs, O&M costs, costs of toll collection, and revenues from the toll operations over an assumed 20-year period. The toll rates used are based on NHAI's existing schedule of tolls indexed for inflation. Previous willingness-to-pay surveys indicate that road users are prepared to pay the established toll rates in return for better service and facilities. Since access to the project highway will not be fully controlled, only a portion of the traffic on the road actually pays tolls. The portion of the traffic that will be tolled on different sections of the road will depend on the location of the tollbooths as well as the availability of alternate routes, both existing and to be developed as part of the rural road development program. The traffic surveys provided preliminary information on the portion of the traffic that would likely be tolled (see Supplementary Appendix M for traffic forecast). This was 75 percent of the heavy commercial vehicles and 20 percent of the buses, automobiles, and light commercial vehicles. The expected FIRR is 11.1 percent. A simulation determined the sensitivity of these results to the assumptions regarding traffic levels, percentage of tollable traffic, and construction costs. The results indicate that the FIRR will be greater than 9 percent with a probability of 95 percent. Details of the FIRR calculation and the underlying assumptions are in Supplementary Appendix N.

91. A separate cash flow analysis compared the projected inflows from toll revenues with the expected cash outflows. The latter includes the costs for not only operations, maintenance, and toll collection costs but also debt service. The latter includes the 20 percent ADB loan that will be onlent from MOF to NHAI and the counterpart costs that will be financed by NHAI. The analysis shows that the projected inflow from toll revenues will cover the expected costs for O&M and toll collection, but is not sufficient to cover debt service. The latter will have to be covered through the revenue from the fuel tax. The crossover to positive cash flow is expected after about 7-10 years of operation.

2. Economic Analysis

92. The economic evaluation of the Project is based on the comparison of the with-project and without-project situations. Without the Project, the existing two-lane road will become more heavily congested and vehicle speeds will decline from the current levels. As the level of

congestion becomes unacceptable, traffic will be diverted to local road networks where these are available or growth of demand will slow down where such networks are nonexistent. Increasing conflicts between fast- and slow-moving vehicles will lead to a higher rate of accidents. The high level of utilization has already led buses and trucks to travel at night to avoid traffic congestion and to accommodate curfews in larger urban centers. Night travel will increase, leading to more accidents in the evening and to greater economic cost because of the inability to travel at the preferred time. Accelerated pavement deterioration through intensive use will increase vehicle operating costs (VOCs) along the existing two-lane road.

93. With the Project, the highway will be widened to four lanes, which should provide sufficient capacity for the next 10-15 years and allow higher operating speeds and better distribution of traffic during the day. The reduction in VOCs and travel time will be substantial. Despite the increase in average traveling speed, the reduction in accidents will be substantial because traffic in opposite directions will be separated by a median, thereby eliminating many of the head-on collisions and other passing accidents. Comparison of reduced operating costs with tolls indicates that commercial vehicles will prefer the toll road to a two-lane alternative even with a doubling of the tolls. Comparison of the value of time savings with the level of tolls suggests that passenger traffic will prefer the toll road to a two-lane alternative even with a slight increase in the real cost of tolls. The additional capacity will allow the current growth in traffic to continue unimpeded and will also generate additional traffic by offering producers the option of tightening their supply chains, commuters the option of longer commutes, and nonbusiness travelers the opportunity to make more frequent shopping trips and visits to relatives and friends.

94. Economic evaluations were carried out for the eight project sections and for the Project as a whole. The economic internal rate of return (EIRR) was calculated for 30 years, which is the estimated economic life of the project improvement. The only benefits included in this calculation were the savings in VOCs, which include the costs of time for truck and bus drivers and their assistants, but not the value of time for other travelers. The economic costs included contracted civil works, procurement of right-of-way, compensation for resettlement, and fees for construction supervision and project management as well as the additional costs for regular and periodic maintenance of a four-lane road and the toll collection and other operation responsibilities. The costs were calculated using a factor of 0.85 to eliminate taxes, duties, and some price distortions. Both costs and benefits were expressed in constant October 2000 prices.

95. Because of uncertainty regarding traffic projections and construction costs, a Monte Carlo simulation was used to test the project benefits and costs. Sensitivity parameters included the rates of population and macroeconomic growth, changes in vehicle mix, and average capacity and elasticity of demand relative to economic growth. The estimated value of the EIRR was 38 percent. The simulation indicated a 95 percent probability that the EIRR would exceed 36 percent (Appendix 13). The estimated savings in travel time for passengers, if included in the expected EIRR, would add 3 percent. The savings due to fewer accidents, specifically fewer head-on collisions are expected to add 1-2 percent to the computed VOC benefits.

96. Up to 50 percent of the reduction in VOCs for heavy commercial vehicles and buses is expected to be passed on to users due to the intense competition in providing these services. Part of the savings will be paid out as tolls and part will be retained by the operators to provide newer equipment and to reduce load levels to meet the tougher regulations on traffic using the road. Another part of the savings will go to persons organizing the movement of goods between rural and urban areas, but again competition is expected to limit their share. For light commercial vehicles, which operate primarily in rural areas, the benefits will accrue in large part to the users as there is open competition among operators of these vehicles. The savings

enjoyed by automobiles will be passed on directly to the owners of private cars and their passengers less the tolls. The users of local taxis and two- and three-wheel vehicles are also expected to benefit as the competition for providing these services is intense and much of the journey will be made without having to pay toll.

97. In addition to the direct benefits of savings in VOC, shorter travel time, and fewer accidents, the Project is expected to generate a number of nonquantifiable benefits such as more reliable transport services. The benefits to intercity traffic will include a fundamental change in the nature of traffic due to a significant reduction in travel time, and increased comfort and safety. It is expected that larger, more efficient trucks and tourist quality intercity buses will be introduced. Efforts by NHAI to consolidate truck parking/service/brokering facilities will further reduce bus and truck operating costs for the towns and villages along the road; the Project will improve access to the major urban centers and allow a more efficient distribution of goods and services, including industrial and agricultural inputs. As the complementary rural road network is developed, the Project will provide villagers with better access to urban markets for sale of their local produce.

B. Poverty Impact

98. The socioeconomic indicators of Karnataka State are a little above the national average. According to the consultant's report on poverty impact, conducted in 2000 on the basis of the governmental 1993/94 survey, the proportion of the population living below the poverty line (PBPL) in Karnataka is 33.2 percent, which is better than the national average of 36.0 percent.[18] The poverty-related issue in this state is, however, not the absolute level of poverty, but the existence of intrastate disparities. The PBPLs in the project areas range from 39.0 percent to 49.7 percent, which is higher than the state average of 33.1 percent, and significantly higher than those of the wealthier parts of Karnataka. A related poverty problem of the project area is that the higher percentage of the population is classified to be scheduled castes (SCs) or scheduled tribes (STs), a most disadvantaged group of people in Indian society. They have suffered from geographic segregation and are deprived of various social and economic opportunities. SCs and STs account for approximately 30 percent of the population in the project area, while the national average is around 20 percent. The higher percentage of PBPLs in the project areas is partially explained by the higher percentages of SC and ST. The project area is predominantly agricultural (57 percent of the population are engaged in agriculture, half of them as landless labor). Agricuture is followed by the manufacturing sector (13 percent) and trade and commerce (12 percent), which are usually more remunerative. Trade and commerce activities are often observed in townships along NH4 and its vicinity.

99. The proposed Project should be regarded as part of the assistance to the Government's overall efforts to improve the entire road network consisting of national, state, district, and rural roads. The Government's road development policy is comprehensive, with the aim of establishing total connectivity within the nation. Its emphasis is not only on the NHs, but also on development of a good rural road network. The Prime Minster recently announced an accelerated development program for rural roads. Its target is to link all villages of more than 1,000 population to major road networks by all-weather roads by the year 2003, and those of more than 500 population, by the year 2007. Strong commitment by the Central Government was indicated by the allocation of 41 percent of the DRF to rural roads, a significantly larger amount than was committed to the NHDP (33 percent).

[18] The latest National Sample Survey in India conducted in 2000 and published in 2001 indicated that the national average of the proportion of the population living below the poverty line declined from 36.0 percent in 1993/94 to 26.0 percent in 1999/2000.

100. The proposed Project is expected to contribute to reducing this intrastate poverty discrepancy in a slightly different manner in the short term and long term. In the short term, construction works and tree planting, together with ensuing maintenance works, will bring immediate cash-earning opportunities to the rural poor. Since the poor are generally not engaged in wage earning jobs and largely dependent on occasional and uncertain employment, these opportunities are more important because of their direct impact on their earnings.

101. More significant are the long-term effects of the Project on reducing intrastate disparities. Improved road networks will increase the economic opportunities of the rural communities by (i) enabling villagers to shift from subsistence farming to market-oriented agricultural surplus production; and (ii) permitting local communities, particularly rural youth, to move outside for better paying occupations such as those in manufacturing or trading. Improved roads will also provide social benefits such as (i) improved access to health, education, and social services; and (ii) increased access to learning opportunities including information technologies, thus reducing the sense of isolation caused by physical remoteness from cultural and commercial centers.

102. Complementarity with other poverty-related programs also needs to be emphasized. For instance, Karnataka has launched a social program called Swavalambana to provide the rural youth with self-employment opportunities such as poultry raising and mushroom cultivation so as to facilitate their escape from a vicious cycle of poverty and lack of job opportunities. Another example is the World Bank assistance for the Integrated Rural Water Supply and Environmental Sanitation Project, which is to improve access to potable water. These programs will not be sustainable nor successful unless an improved road network is available. A proposed road improvement program will increase the chances of success of these social programs (Appendix 14 gives the poverty impact assessment).

C. Communicable Diseases and Other Social Dimensions

103. Among the South Asian countries, India has the highest prevalence of HIV/AIDS.[19] About 0.7 percent of the sexually active age group of 15-49 is HIV/AIDS infected, which translates into 3.5 million people, a figure second only to South Africa, which has over 4 million.

104. Because of the seriousness of the incidence of sexually transmitted diseases, the Government has taken a series of actions with the assistance of international aid agencies. In 1989, a medium-term plan for HIV/AIDS control was developed with the support of the World Health Organization. A national HIV/AIDS project financed by the World Bank was approved in 1992 and extended up to March 1999. On 15 December 1999, India launched the second five-year National AIDS Control Project with a budget of $230 million, comprising $191 million from the World Bank and $39 million from central and state governments. This World Bank project aims at a decentralized, multisectoral approach to HIV prevention and care, with the specific objectives of reducing the rate of growth of HIV/AIDS infection in India and strengthening the country's capacity to respond to the epidemic through cost-effective prevention and care interventions.

105. One feature of India's HIV/AIDS infected population is its concentration in four states/ territories (Maharashtra, Manipur, Pondicherry, and Tamil Nadu), with other states having lower rates of infection. Situated between the states of Maharashtra and Tamil Nadu, Karnataka has become the fifth highly infected state. The influx of construction labor in the Project area may further increase opportunities for transmitting HIV/AIDS. It was agreed that NHAI will ensure that civil works contractors provide HIV/AIDS prevention training to their construction workers. For

[19] Human immunodeficiency virus/acquired immunodeficiency syndrome.

truck drivers, another cause of HIV/AIDS transmission, Karnataka State AIDS Prevention Society (KSAPS) has been providing HIV/AIDS preventive programs with the assistance of United Kingdom Department for International Development (DFID), mobilizing a network of 25 local NGOs. If further assistance needs are identified, KSAPS may request ADB to extend TA aimed at reducing poverty in developing member countries.

106. Another potential problem during the construction phase is child labor. It was agreed that NHAI will ensure that civil works contracts include a provision forbidding contractors to use child labor. The construction supervision consultants will also ensure compliance with this provision.

D. Risks

107. A potential risk to the Project is the possible delays in implementation due to prolonged land acquisition. The scale of land acquisition required for this Project is not that extensive compared with that for the usual highway projects. Over three fourths of the land necessary for main carriageways are already available. Additionally required land is mostly for service roads, most of which is open land where no structures exist and thus less likely to cause major acquisition problems. Furthermore, streamlined land acquisition procedure recently introduced by the National Highways Laws (Amendment), 1997 (the NH Act) will minimize the potential risk of implementation delay. The new procedure has enabled NHAI to proceed with land acquisition in this Project in a more expeditious and predictable manner. Based on the NH Act, the Government has issued public notification (action under Section 3-A of the NH Act) to declare its intention to obtain land for public purposes. The deadline for filing objections (action under Section 3-C of the NH Act) has already passed for the entire land. Objections or concerns filed in response to the above notification have already been resolved or properly handled. Declaration of acquisition (action under Section 3-D) will be published by 31 August 2001 for four of the five total contracts for 203 km, and by 30 September 2001 for the balance stretch of 59 km, covering one contract. In addition to this progress in the land acquisition process, NHAI has assured ADB of expeditious implementation of land acquisition by agreeing that NHAI will not award any civil works contract until after it (i) acquires or makes available on a timely basis the land and rights to land, free from any encumbrances, required for the execution of the contract; and (ii) clears on a timely basis the utilities, trees, and any other obstruction from the land to be used for construction activities relating to the contract.

108. Another element that can potentially delay implementation is resettlement. This risk has also been minimized by establishing a resettlement unit in the PIU whose staff will dedicate their time to resolving and processing all resettlement-related matters including the payment of compensation. It was agreed that coordination mechanisms would be established at state and district levels to resolve any resettlement-related issues that may occur.

VI. ASSURANCES

109. The Government and NHAI have given the following specific assurances, in addition to the standard assurances, which are incorporated in the legal documents:

(i) Project Execution. The Government will ensure that NHAI is delegated sufficient administrative and financial authority for the expeditious implementation of procurement and disbursement for the Project.

(ii) Project implementation

(a) The PIU will be delegated sufficient administrative autonomy for effective and timely decisions on Project implementation matters.

(b) NHAI will ensure that the PIU is adequately staffed by experienced personnel at both managerial and professional levels for effective Project implementation.

(c) NHAI will ensure that the PIU has a resettlement unit and, to the extent possible, 50 percent of the personnel engaged from NGOs to assist in the unit will be women.

(d) A high level committee will be set up by NHAI within three months of loan effectiveness in accordance with the RAP. The committee will be responsible for monitoring the implementation of the RAP and the activities of the PIU resettlement unit.

(iii) Highway upgrading

(a) NHAI will not award any civil works contract until after it (i) acquires or makes available on a timely basis the land and rights to land, free from any encumbrances required for the execution of the contract; and (ii) clears on a timely basis the utilities, trees and any other obstruction from the land to be used for construction activities relating to the contract.

(b) NHAI will ensure timely administrative clearance for removal of utilities and trees from the Project highway as required for the speedy implementation of the Project.

(iv) Road safety

(a) NHAI will monitor the incidence of traffic accidents and report to ADB, in a format satisfactory to ADB, during the project implementation period and two years after its completion.

(b) NHAI will carry out a safety audit for the WTC during the Project implementation period and develop recommendations to be used on other parts of the national highway system by 31 December 2004.

(v) Commercializing of operation and maintenance. NHAI will ensure that upon completion of the Project highway, its operation and maintenance are awarded to the private sector under concession arrangements satisfactory to ADB. NHAI will submit the terms and conditions of the proposed concession to ADB for review and comment prior to inviting bids from the private sector.

(vi) Enhancing of the corporate finance capability of NHAI

(a) The Government and NHAI will implement in a timely manner the recommendations of the TA, as mutually agreed upon by the Government, ADB, and NHAI. For this purpose NHAI will establish a task force, or assign an appropriate team by 31 October 2001.

(b) NHAI will also implement the first securitization project through its special purpose vehicles, based on the results of the TA, by 31 March 2004 or such other dates acceptable to the Government, ADB, and NHAI, under arrangements satisfactory to ADB and the Government.

(vii) Environment

(a) NHAI will ensure that the Project is undertaken in compliance with the *Environmental Assessment Requirements of ADB,* 1998 and the *Environmental Guidelines for Selected Infrastructure Development Projects,* 1993, as amended from time to time.

(b) NHAI will ensure that all environmental mitigation measures identified in the summary initial environmental examination are incorporated into the detailed project design and are followed during construction, operation, and maintenance of the Project highway. NHAI will also ensure that the Project is designed and constructed according to the Environmental Management Action Plan agreed upon with ADB in accordance with ADB's *Environmental Guidelines for Selected Infrastructure Development Projects.*

(c) NHAI will conduct a training program for environmental management for its staff as well as for the staff of the contractors under the Project.

(viii) Resettlement plan

(a) NHAI will implement the RAP agreed upon with ADB, under arrangements satisfactory to ADB in accordance with ADB's policy on involuntary resettlement and *Handbook on Resettlement,* 1998, as amended from time to time.

(b) NHAI will ensure that any person who may be relocated as a consequence of the Project is consulted and fairly compensated on the basis of replacement values such that his or her living standards are not adversely affected by the Project.

(c) NHAI will carry out timely settlement of compensation payments for land acquired for the Project.

(ix) Social measures

(a) NHAI will ensure public awareness and acceptance of the Project through participation, as necessary, of NGOs and the community.

(b) NHAI will ensure under civil works contracts that contractors (a) will carry out, including through engaging suitable nongovernmental organizations, the HIV/AIDS awareness and prevention programs for labor; and (b) will not use children as labor, by incorporating a provision to these effects in their contracts.

(x) Project Implementation, benefit monitoring, and progress review

(a) The Government and NHAI will undertake periodic reviews during Project implementation, to evaluate the scope, implementation arrangements (with due participation of nongovernment and community-based organizations), benefit monitoring, progress and achievement of the objectives of the Project in accordance with ADB's *Project Performance Management Systems Handbook.*

(b) Under the midterm review of the Project, the Government, NHAI, and ADB will review the results of the private-sector-financed projects along the WTC to assess appropriate models of private sector participation for national highway development.

(c) Except as otherwise agreed upon and required by ADB, NHAI will implement in a timely manner the Study on Toll System by 31 December 2003.

(xi) The Government will actively consider allowing NHAI to use the toll revenue collected by NHAI on its behalf, for maintenance of the national highways and other related purposes by 31 December 2004.

VII. RECOMMENDATION

110. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan of $240,000,000 to India for the Western Transport Corridor Project from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's LIBOR-based loan facility, an amortization period of 25 years, including a grace period of 5 years, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board.

MYOUNG-HO SHIN
Vice President

24 August 2001

APPENDIXES

SUPPLEMENTARY APPENDIXES
(available upon request)

PROJECT FRAMEWORK

Design Summary	Project Targets	Project Monitoring	Risks/Assumptions
GOAL • Contribute to sustainable economic growth	• Reduce the transport cost for goods and passenger, thus increasing the efficiency of economic activities in India • Provide increased job opportunities		
PURPOSES • Increase the efficiency of the transport system by expanding capacity of the existing road network, with increased participation of the private sector in highway development and maintenance • Enhance road safety	• Reduce volume/capacity ratio from 0.63 to 0.30 by 2005 • Reduced travel time by 3 hours for cars and by 3.5 hours for trucks along the project section by 2005 • Reduce the number of fatalities along the project section from 262 to 90 by 2005 • Increase the highways developed by the private sector from 9 percent to 24 percent and highways to be operated and maintained by the private sector from 10 percent to 41 percent	• State data and progress report • Midterm review	• Efficiency of road transport services • Lack of interest of the private sector investors in highway development and operation and maintenance (O&M)
OUTPUTS • Upgrade the existing two-lane carriageway highways to four-lane divided carriageway with service road along the right-of-way • Develop build-operate-transfer (BOT) tender documents for toll road O&M of the Project	• Construction to be completed by December 2004 • O&M concession to be concluded by December 2003	• Progress report	• Delay in procurement of contractors • Delay in recruitment of consultants
INPUTS • Procurement of civil works for the above construction • Recruitment of a consultant to complete the concession-based O&M for the Project	• ADB provides loan of $240 million, while $138 million equivalent will be financed by the Government.	• Audited project account	

Appendix 2

ROAD NETWORK OF INDIA

Table A2.1: Road Network, 1998
(length in '000 km)

Category	1951	1998	Growth (percent per annum)
National Highways	20	50	5.2
State Highways	60	119	4.2
Other Roads	320	3,121	20.7
Total	**400**	**3,290**	**17.5**

[a] This does not include 200,000 km of urban roads.

Table A2.2: National and State Highways, 1998
(length in km)

Category of Road	National Highways		State Highways	
	Km	Percent	Km	Percent
Below Standard, Single Lane	1,446	2.9	25,945	21.8
Single Lane	6,700	13.5	80,674	67.9
Double Lane	39,595	79.9	10.555	8.9
Multilane	1,844	3.7	1,639	1.4
Total	**49,585**	**100.0**	**118,813**	**100.0**

Source: Government of India. Ninth Five-Year Plan (1997-2002), Delhi.

Appendix 3

SUMMARY OF THE DEVELOPMENT STRATEGY FOR THE WESTERN TRANSPORT CORRIDOR

Route	Section	Status	Construction Length (km)		O&M Length (km)		Comments
			PPP	Public Funds	PPP	Public Funds	
NH8	Delhi–Gurgaon	Planned/ Processing	21		21		NHAI SPV for upgrade to access controlled expressway
NH8	Gurgaon – Rajasthan Border	Existing		70		70	
NH8	Rajasthan Border – Kotputli	Existing		55		55	
NH8	Kotputli – Chandwaji	Existing		58		58	
NH8	Jaipur Bypass Phase II	Planned	35	0	35		NHAI SPV
NH8	Jaipur Bypass Phase I	Existing		14	14		
NH8	Jaipur – Kishangarh	Planned	93		93		Real Toll BOT
NH79	Kishangarh – Chittaurgarh	Planned		211		211	
NH76	Chittaurgarh – Udaipur	Planned		116		116	
NH8	Udaipur – Gujarat Border	Planned		112		112	
NH8	Gujarat Border – Gandhinagar	Planned		105		105	
NH8	Gandhinagar – Ahmadabad	Existing		25		25	
NH8	Ahmadabad – Vadodara	Under Construction	93		93		NHAI SPV
NH8	Vadodara – Surat	Existing		152		152	
NH8	Surat – Manor	Planned		176	176		O&M Concession
NH8	Manor – Mumbai	Under construction		68		68	
NH4	Mumbai – Pune	Under construction	90		90		MSRDC
NH4	Pune Westerly Bypass	Under construction		34		34	
NH4	Pune – Satara	Planned		108		108	
NH4	Satara – Maharashtra Border	Planned	133		133		Real Toll BOT
NH4	Maharashtra Border – Belgaum	Planned	77		77		Annuity BOT
NH4	Belgaum Bypass	Planned		20		20	
NH4	Belgaum – Dharwad	Planned	62		62		Annuity BOT
NH4	Dharwad – Hubli	Under operation	32		32		Real Toll BOT
NH4	Hubli – Haveri	Planned		64		64	
NH4	Haveri – Harihar	Planned		56	265		O&M Concession
NH4	Harihar – Sira	Planned		162			
NH4	Sira Bypass	Under construction		6			
NH4	Sira – Tumkur	Planned		41			
NH4	Tumkur Bypass	Planned/processing		13		13	
NH4	Tumkur – Nelamangala	Processing	32		32		Real Toll BOT
NH4	Nelamangala – Bangalore	Existing		30		30	
NH7	Bangalore – Hosur	Existing		33		33	
NH7	Hosur – Krishnagiri	Under construction		60		60	
NH46	Krishnagiri – Ranippettai	Planned		145		145	
NH4	Ranippettai – Chennai	Planned/processing		94		94	
		Total	**647**	**2,026**	**1,102**	**1,587**	
			24%	**76%**	**41%**	**59%**	
Total Length of Western Transport Corridor				**2,664 km**			

BOT = build-operate-transfer, MSRDC = Maharashtra State Road Development Corporation, NH = national highways, NHAI = National Highways Authority of India, O&M = operation and maintenance, PPP = public-private partnership, SPU = State Planning Unit, SPV = special purpose vehicle.

POLICY FRAMEWORK

Main Areas of Reform	Actions Taken	Remaining Issues	Actions to Be Taken and Notes
A. Corporate Governance			
Separation of regulatory and operational functions	• Act for National Highways Authority of India (NHAI) was enacted in 1988.		
	• Operationalization of NHAI in 1995		
Medium- and long-term corporate goal to be established		• A corporate strategy is to be developed.	• Corporate transition team is to be established in NHAI by October 2001. • A World Bank (WB)-funded study on a corporate strategy to be completed by December 2003 • Based on the study recommendations, NHAI is to develop action plans to implement the study recommendation by December 2004.
		• Establishment of a financially autonomous entity (narrow definition)	• A strategic financial planning model (which will allow comparison of various development scenarios of NHAI) to be developed by June 2003 (ADB-funded) • A study for comparing the current and alternative forms of NHAI to be completed by January 2003 • An overall plan to establish financial autonomy is to be developed by December 2003.
		• Adoption of standard accounting appropriate to its operations and consistent with international practices [a covenant of Loan 1747-IND]	• Development of an agreed road map for the modernization of accounting policies and practices by August 2001. • Implementation of a road map according to the timetable specified in Appendix 8.
Delegation of decision making authority to NHAI	• Public Investment Board accorded blanket approval for investment program of NHAI. • NHAI Board was strengthened with a broader decision-making authority on investment and procurement [2000]. • An advisory body was established to reflect the views of stakeholders [2000].	• Strengthening financial control and monitoring capability over the project management process	• Agreed to delegate a broad authority to the Consultant Engineer to clear contract deviation. Bidding documents incorporating this agreement were approved in May 2001.

Main Areas of Reform	Actions Taken	Remaining Issues	Actions to Be Taken and Notes
A broader authority to recruit its staff	NHAI chairman was given the authority to recruit its staff at both management and professional levels [1997].		
B. Improved Financial Autonomy			
Revamping the road fund	• Cess on diesel and petrol was levied as sources for the dedicated road fund (DRF) [1998/99].		
	• An act determining the allocation of road funds was enacted in 2000: roughly speaking, 33 percent for national highways (NH), 17 percent for state roads, 42 percent for rural roads, and the remaining 8 percent for rail crossing and other purposes.		
		• Get the DRF management board to be represented by major stakeholders including users	
Strengthening of fund mobilization capability from capital markets	• Bonds were issued to raise fund from domestic capital markets [2000 & 2001].		
		• Another type of bonds is to be issued.	• Experiences of the bond issues to be reviewed, lessons to be learned, and the possibility of using guarantee to be studied. The report is to be sent to ADB by March 2002 as part of the advisory technical assistance study on corporate finance enhancement.
		• Raise additional development fund by securitization.	• A corporate finance study is to start by February 2002 and to be completed by January 2003. • Based on the study results, NHAI is to develop its own action plan by May 2003. • The first securitization project is to be implemented by NHAI by March 2004, or such other dates acceptable to the GOI, ADB, and NHAI.
		• Need to enhance treasury capability so as to maximize yield from deposited money	• A corporate finance study is to start by February 2002 and to be completed by January 2003. • Based on the study results, NHAI is to develop its own action plan by May 2003.

Main Areas of Reform	Actions Taken	Remaining Issues	Actions to Be Taken and Notes
Introduction of effective tolling system		• Periodical review of toll structure [a covenant of Loan 1747-IND] • The current toll systems have been introduced in a rather adhoc manner. A more consistent and integrated system needs to be introduced.	• A study on toll system (level, modality of charging, and location of tollbooths and campaign for increasing acceptance of tolls) is to start by December 2001 and end by December 2002. • From the study results, NHAI is to develop its own action plan by June 2003. • NHAI's action plan is to be implemented by December 2003.
C. Enhanced Institutional Capability for Project Implementation and Highway Management			
Simplification of procedure for land acquisition	• NHAI Act was amended in 1997, enabling NHAI to acquire land in a transparent and simplified manner.		
	• Government designated selected NHAI staff as competent authorities so as to process land acquisition in an expeditious manner.		
Strengthen maintenance		▪ Toll revenues should be allocated for NH maintenance.	• The GOI agreed to actively consider allowing toll collected by NHAI to be retained and used by NHAI for maintenance of NH system.
		• Need to commercialize O&M functions for the Surat-Manor and Tumkur-Haveri sections [a covenant of Loan 1747-IND]	• A tender document including concession agreement is to be developed by June 2002. • A concessionaire is to be selected by December 2003.
Effective outsourcing		• Need to strengthen contract management capability	• Most of the relevant staffs should receive training in contract management to be provided by a consultant by December 2002.

Main Areas of Reform	Actions Taken	Remaining Issues	Actions to Be Taken and Notes
D. Private Sector Participation			
Development of a comprehensive private sector (PS) development policy	• Ministry of Surface Transport (MOST) issued a policy for facilitating PS participation in road development [1997].		
	• A private-public partnership development strategy was prepared in 2000 for the western transport corridor [a covenant of Loan 1747-IND].		• Review the results of private sector participation in developing WTC in terms of the extent of PS participation and the extent of the public sector contribution by the mid-term review scheduled in May 2003
Introduction of build-operate-transfer (BOT) scheme for NH development	• Model BOT tender document including concession contract was developed in 2000.	• Jaipur-Kishangarh section (93 km) is to be developed under BOT scheme.	• Prequalification (PQ) document was issued in April 2000. • BOT concessionaire is to be selected by August 2001. • Construction to start by May 2002.
		• Tumkur-Nelanmangala section (32 km), located immediately south-east of the project section, is to be developed under BOT scheme.	• PQ document was issued in November 2000. • BOT concessionaire selected in April 2001. • Construction to start by December 2001
		• Jaipur bypass securitization is to be implemented.	• SPV is to be established by September 2001. • SPV's stocks are to be sold to the private sector.
E. Road Safety			
Improve highway design so as to enhance road safety		• Separate slow- and fast-moving traffic by fence and row of trees	• To be implemented on Tumkur-Haveri by June 2005
		• Conduct safety audit on a corridor basis	• To be implemented for the Western Transport Corridor with the use of the Surat-Manor project fund

Appendix 5

PROJECT COST ESTIMATES
($ million)

Item	Foreign Exchange	Local Currency	Total
A. Base Cost [a]			
1. Right-of-Way	0.0	10.6	10.6
2. Civil Works			
Package I (km 75-km 116.4)	28.8	16.8	45.6
Package II (km 122.3-km 189)	49.4	28.2	77.6
Package III (km 189-km 207)	17.2	9.4	26.6
Package IV (km 207-km 284)	53.4	30.4	83.8
Package IV (km 284-km 340)	30.9	16.4	47.3
3. Resettlement	0.0	5.8	5.8
4. Consulting Services [b]			
Construction Supervision	14.0	0.0	14.0
Environment Training	0.04	0.00	0.04
5. Project Management	0.0	5.6	5.6
Subtotal (A)	**193.8**	**123.3**	**317.1**
B. Contingencies			
1. Physical [c]	13.6	8.1	21.7
2. Price [d]	10.1	6.6	16.7
Subtotal (B)	**23.7**	**14.7**	**38.4**
C. Front-End Fee	**2.4**	**0.0**	**2.4**
D. Interest/Commitment Charges During Construction	**20.1**	**0.0**	**20.1**
Total	**240.0**	**138.0**	**378.0**

[a] In October 2000 prices, inclusive of taxes and duties.

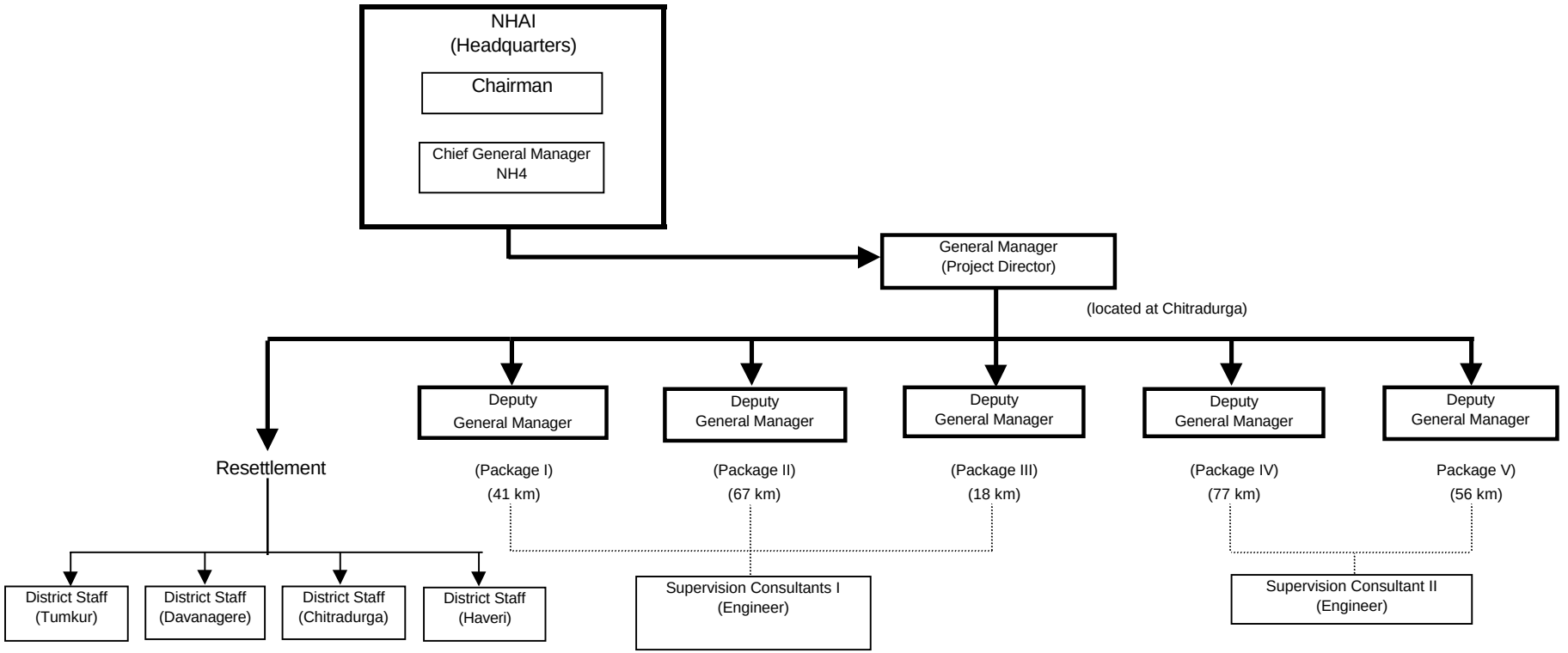
[b] Costs of the consulting services are listed as foreign exchange cost because of the way the services are procured.

[c] At 7 percent of base costs since the estimation is based on the detailed design and is less subject to major changes at later stage (for right-of-way costs, 2 percent was used).

[d] At 2.7 percent annually of foreign exchange and dollar equivalent local currency costs.

Source: Feasibility Study and Mission.

ORGANIZATION OF THE
PROJECT IMPLEMENTATION UNIT



Appendix 7

LIST OF CONTRACT PACKAGES AND MODE OF PROCUREMENT

Civil Works Contract No.	Contract Details [a]	Approximate Value ($ million	Procurement Mode
1	Package I (km 75-km 116.4)	45.64	ICB
2	Package II (km 122.3-km 189)	77.61	ICB
3	Package III (km 189-km 207)	26.67	ICB
4	Package IV (km 207-km 284)	83.78	ICB
5	Package V (km 284-km 340)	47.30	ICB
	Total	**281.00**	

ICB = international competitive bidding.

[a] Civil works only, excluding land acquisition and resettlement.

Appendix 8

STAGED APPROACH
FOR MODERNIZATION OF ACCOUNTING POLICIES AND PRACTICES

Nature of NHAI	*Fund mobilization mechanism*	*Accounting policies and standards*	*ADB's intervention*
Transition from MOST to NHAI	Cess money and government grants	Shift from cash basis to accrual basis, and substantial introduction of commercial practices	Surat Manor Project
Agent for NH development and maintenance	Private issue of domestic bonds under the implicit government guarantee	Development of suitable accounting policies under commercial accounting principles	2001 NH Project (WTC Project)
Revenue earning entity	Public issue of domestic bonds	Adoption of generally accepted accounting practices (GAAP-I) of India	2002 NH Project
Revenue earning entity	Issue of bonds in foreign capital markets	Adoption of international accounting standards (IAS)	2003 NH Project

NH: National Highways
MOST: Ministry of Surface Transport
WTC:Western Transport Corridor

Appendix 9

NATIONAL HIGHWAYS AUTHORITY OF INDIA
INCOME STATEMENT AND CASH FLOW
FOR YEAR ENDED 31 MARCH 2000
(Rs million)

Item	Actual 1996	Actual 1997	Actual 1998	Actual 1999	Actual [a] 2000
Revenue					
Toll Operations	0.0	0.0	0.0	0.0	0.0
Management Fee	4.1	9.6	54.7	120.8	343.2
Total Revenue	4.1	9.6	54.7	120.8	343.2
Expenses					
Salaries and Administration	14.7	21.9	65.5	84.9	104.5
Operation & Maintenance	0.0	0.0	0.0	23.3	3.6
Depreciation	1.9	2.4	3.9	3.7	4.4
Total Expenses	16.6	24.3	69.4	111.9	112.5
Operating Income	-12.5	-14.7	-14.7	8.9	230.7
Interest Income	0.8	19.9	448.8	658.2	715.1
Interest Expense	0.0	0.0	0.0	0.0	0.0
Net Income Before Tax	-11.7	5.2	434.1	667.1	945.8
Taxation	0.0	0.0	0.0	0.0	0.0
Net Income After Tax	-11.7	5.2	434.1	667.1	945.8
Source of Funds					
Net Income After Tax	-11.7	5.2	434.1	667.1	945.8
Depreciation	1.9	2.4	3.8	3.7	4.4
Internally Generated Funds	-9.8	7.6	437.9	670.7	949.4
Government Grants	215.0	2,260.4	5,374.0	2,640.0	16,836.0
Borrowings	0.0	0.0	0.0	900.0	900.0
Total Sources of Funds	205.2	2,268.0	5,811.9	4,210.0	18,685.4
Application of Funds					
Fixed Assets	10.7	10.1	2.0	4.8	33.5
Highway Development	0.0	339.3	208.0	2,720.3	5,587.0
Debt Repayment	0.0	0.0	0.0	0.0	0.0
Working Capital	-0.3	-93.3	238.6	1,025.9	2,856.9
Total Application of Funds	10.4	256.1	448.6	3,751.0	8,477.4
Net Cash Flow	194.8	2,011.9	5,363.3	459.0	10,208.0
Opening Cash Balance	0.0	194.8	2,206.7	7,570.0	8,029.0
Closing Cash Balance	194.8	2,206.7	7,570.0	8,029.0	18,237.0

[a] Actual unaudited.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A Introduction

1. The Ministry of Environment and Forests (MOEF) of India is responsible for granting environmental clearance (EC) for development projects including highways. In 1997, MOEF announced exemption from EC for any highway improvement project on an existing alignment with "marginal land acquisition", provided it did not pass through ecologically sensitive areas such as national parks, sanctuaries, tiger reserves, and forest reserves. In 1999, MOEF announced further that "marginal land acquisition" means land acquisition not exceeding a total of 20 meters (m) wide on average, and that short realignments and bypasses would also be exempt if the cost of the realignments or bypasses alone did not exceed $10.9 million (Rs500 million).

2. As a matter of policy, MOEF requires a detailed environmental impact assessment (EIA) for all highway projects costing more than Rs500 million, even if they are exempt from EC. The purpose of the EIA study is to identify environmental issues that have significant impact due to the improvement of an existing highway; assess impacts related to project locations, construction, and operations; and propose suitable mitigation measures. The Asian Development Bank (ADB) put the project highway in environmental category B and required an initial environmental examination (IEE) to ensure that any environmental concerns of the Project are reviewed and considered. The National Highways Authority of India (NHAI) thus appointed its project design consultants to prepare an EIA, which was then revised into an IEE following ADB format, to meet the environmental requirements of both MOEF and ADB.

3. This summary IEE (SIEE) is based on a review of the EIA and information gathered by the project preparatory technical assistance (see footnote 16 in page 14).

B. Description of the Project

4. The project highway is part of National Highway No. 4 (NH4) traversing Karnataka State and connecting the major ports of Mumbai and Chennai. The project will reconstruct and widen the present 259 km single carriageway Tumkur–Harihar–Haveri section of NH4 passing through the Tumkur and Sira Taluks of Tumkur District, the Chitradurga and Hiriyur Taluks of Chitradurga District, the Davanagere and Harihar Taluks of Davanagere District, and the Rannibennuer, Byadgi and Haveri Taluks of Haveri District.

5. It is proposed that, the existing single carriageway be widened by constructing two additional lanes and a central median along the existing two lanes. Some 24 kilometers (km) of bypass is proposed at four congested urban areas while, in other less congested urban areas, concentric widening with a narrow median is proposed to limit land acquisition.

6. Service/side roads running parallel to and within the NH4 right-of-way are proposed for 75 percent of the project length to serve as collectors/distributors for local traffic, thus separating the local slow-moving traffic from the fast traffic on the NH4.

7. The project will be implemented under five concurrent construction contracts. The contracts are expected to be awarded in October 2001 with expected completion date of June 2005.

C. Description of the Environment

1. Physical Environment

8. The existing alignment of the project highway is located in the plains of the South Deccan Plateau, which is rolling terrain with gentle slopes and occasional rocky outcrop. Geologically the rock formation forms part of the Peninsular Shield and comprises Peninsular gneiss and upper Dharward schist. The route of the NH4 between Tumkur and Harihar falls within the Tungabhadra River subbasin. The project corridor is characterized by excessively well-drained clayey soils with moderate to severe erosion potential. The soil in the Harihar–Haveri section (Km 282-340) is predominantly clayey and black and is known as Black Cotton Soil as it is ideal for growing cotton. Its erosion potential is low.

9. The region gets maximum rainfall during the southwest monsoon (June–September), with annual rainfall in the range of 600 millimeters (mm) to 1,000 mm. The temperature is moderate with the highest rarely exceeding 36ºC and the minimum rarely below 17ºC. Depending on the season, the relative humidity varies from up to 87 percent in the morning to as low as 27 percent in the evening. The predominant wind direction is west, but southwest for 20 percent and east for 26 percent of the year. The region has clear visibility of over 20 km for 300 days a year on average.

10. The project highway traverses numerous drainage channels and rivulets of the Tungabhadra subbasin including the river itself. There are more than 400 drainage structures and six major bridges, which will need to be upgraded to provide cross drainage for the widened highway. The rivers and drainage channels along the project route are dry for some 9–10 months of each year. Rainfall during the monsoon is stored in tanks/ponds and provides irrigation for crops and water for livestock for 2–3 months. Two of the tanks, Arasinakere and Matadakere, between Km 202–204 have historic importance, with associated ancient religious buildings.

11. Boreholes and wells are a prime source of water for the population in the corridor and for agriculture. Groundwater extraction is significantly high in the taluka of Tumkur, which is categorized as Dark, indicating groundwater utilization exceeds 85 percent of the reserve – a critical status, with little scope for further exploitation. Water levels below ground level during 1978–1997 indicate a cumulative decline from 10 meters (m) to 15 m in this taluka. The groundwater levels in the other talukas are categorized as Grey (utilization 80-50 percent of the reserve), or White (utilization less than 50 percent of the reserve) and therefore have potential for extraction of water.

12. Water quality in the project corridor was monitored at the Tungabhadra River and at sampling stations located at bridge crossings, tubewells, and dug wells. The results indicate that the pH value of the water in the river is 8.4, that at the other locations range from 7.2 to 8.2. Dissolved oxygen was 5.1 milligrams (mg)/liter at the river and at the other locations 4.2 -o 6 mg/liter. Biological oxygen demand was 16 mg/liter at the river and 3.5-32 mg/liter at the other locations. Total dissolved solids were 145 mg/liter at the river and 324-1,030 mg/liter at the other locations. The results show that the concentration of dissolved solids in surface water is within safe limits for aquatic life. However, the biological oxygen demand in both surface water and groundwater needs conventional treatment and/or disinfection before the water is use for drinking.

13. The baseline ambient air quality was assessed at nine locations close to human settlements. The air quality parameters recorded were suspended particulate matter of 136–260 micrograms per cubic meter (µg/m³), respirable particulate matter of 40–72 µg/m³, sulfur oxides of 18–42 µg/m³, nitrogen oxides of 11–36 µg/m³, carbon monoxide of 800–1,800 µg/m³, lead of 0.008–/0.015 µg/m³, and hydrocarbons of 0.6–2.1 µg/m³. The average air quality values are within the national ambient air quality standards set by the Central Pollution Control Board of India for residential and rural areas.

14. Baseline ambient noise level monitoring was carried out at 14 stations along the project corridor. The background ambient noise levels of 62–71 decibels (dB)(A) in daytime and 68–57 dB(A) at nighttime exceed the maximum limits set by the Central Pollution Control Board of India for residential and commercial areas.

15. Agriculture accounts for 74 percent of land use in the project corridor.

2. Ecological Resources

16. The project highway does not pass through forest reserves but passes through village forests at 12 locations in Tumkur, Sira, and Hiriyur taluks. The village forests have been developed under various state government programs including social forestry by the Forest Department. In some stretches of the project corridor, trees are 40-50 years old and include giant tamarind, neem, banyan, and peepal. In some sections, trees on both sides of the existing road have formed a symmetrical canopy to give the appearance of a green tunnel. Giant trees found within village limits are observed to be focal points for social interaction, for community/religious congregations, or for weekly markets.

17. There are no reports of wild life species or endangered species in the project corridor.

18. There are no cultural heritage sites, sensitive or critical habitats, national parks, wild life sanctuaries, wetlands, or protected nature reserves along the project corridor.

19. No protected/declared archaeological sites or historical monuments are affected by the project. A fort in ruins 30 m from the right-of-way near Aimangala (Km 178–179) has historical significance, but is neither protected nor declared a monument and is not physically affected by the project.

3. Human and Economic Development and Quality of Life Values

20. The 1991 census shows that 83 percent of the population in the five districts of the corridor are rural (the All India average is 74 percent) and 17 percent are urban. Of these, 13–21 percent are scheduled castes (the All India average is 16 percent) and 5–17 percent are scheduled tribes (All India average is 8 percent).

21. The physical infrastructure for education is generally inadequate and accounts for the literacy level of 52–56 percent, which approximates the All India average of 52 percent.

22. Public health facilities are available, but medical infrastructure is not consistent. The infant mortality rate is 51–74 per thousand compared with the All India average of 72 per thousand.

D. Screening of Potential Environmental Impacts and Mitigation Measures

1. Earthworks

23. An impact of any major highway project is the requirement of fill material for embankments (for this project some 13 million m^3). The project highway has been designed as a widening scheme and the utilization of the existing road, and consequently the existing embankment, minimizes the earthwork requirement.

24. The construction contractor will be responsible for obtaining the borrow material, but the design consultants have identified the tank beds and dry highlands as acceptable and economic sources along the corridor. The contractor will be required to obtain the approval of the Department of Mines and Geology of the state for borrow from the dry highlands and the approval of the Minor Irrigation Department for borrow from the tank beds.

25. Where borrow is from tank beds, the contractor will be required to excavate uniformly to maintain a smooth bed profile and to regrade the inlet channels for a distance of at least 100 m. In the case of tank beds acquired for a highway project, the respective tanks are to be desilted in consultation with the Minor Irrigation Department, government of Karnataka, to maintain the existing storage capacity. These measures will support the current state program to maximize replenishment of groundwater resources by improving inlets and desilting the tanks. The earthwork operations for the highway will only take place in the dry season when the tanks are also dry; therefore there will be no impact on replenishment.

26. Where borrow is from dry highlands, the area will be reinstated by forming gentle slopes and planting trees.

27. The contractor will be required to construct gravel haul roads to and from the borrow areas and to suppress dust by regular spraying with water. The haul roads will be reinstated on completion of the works and left for use by the local community.

2. Aggregates

28. The quantity of aggregates for the pavement and for concrete is estimated to be 5 million m^3. The contractor will be required to obtain these from quarries licensed by the Department of Mines and Geology of the Karnataka government. Quarry operators will be required to comply with the relevant legislation for occupational safety and to adopt adequate dust suppression measures.

29. The contractor will be required to construct single-lane haul roads from the quarries to the site, if not already existing, and to suppress dust by regular spraying with water. The haul roads will be reinstated on completion of the works and will be left for use by the local community.

3. Groundwater

30. The water required for construction is estimated to be some 32 m^3 per kilometer per day. It is anticipated that the contractor will sink boreholes to obtain this water and so will be required to obtain approval from the Ground Water Authority of Karnataka.

31. The water requirement represents about 10 percent of the average annual recharge of groundwater and may result in some short-term impact to the aquifer, particularly in the Tumkur taluka where existing demand exceeds 85 percent of the reserves. This will be mitigated, where necessary, by constructing of additional percolation tanks, pits, and shafts to increase the rate of recharging in the monsoon season. NHAI will coordinate the mitigation work with the Ground Water Authority, which is currently implementing statewide monitoring and a replenishment program.

4. Water Bodies

32. Eight tanks fall within the proposed widened right-of-way. They will be considered for desilting, in consultation with the Minor Irrigation Department, to maintain the existing storage capacity/volume. Impact on the water bodies will not be significant.

5. Water Quality

33. The surface water drainage system for the project will comprise concrete-lined side ditches that discharge into the nearest available watercourse or body.

34. The contractor will be required to provide adequate water supply, septic tanks, and soakaway pits for the wastes from the labor camps and from plant, storage, and workshop areas. In addition, the petrol, oil, and lubricant storage areas will have impervious floors, oil and grease in storm runoff will be trapped prior to final disposal into nearby watercourses.

6. Landscape and Planting

35. Approximately 20,500 trees will be felled within the proposed right-of-way. They are not ecologically or commercially significant, but are a visual benefit to road users and the adjacent communities.

36. For loss of forest, the Karnataka Forest Department requires that compensatory planting amounting to double the trees felled. NHAI will provide the department with funds for replacement planting.

37. In addition, NHAI will do amenity planting within the new right-of-way and will appoint a specialist consultant to prepare the landscape design for the project highway. The planting design will incorporate indigenous species that offer variety and visual interest, and require minimum maintenance after establishment. Shrubs will be planted on the median strip. NHAI will appoint a specialist to implement the planting and getting responsible for maintenance and watering for three years when the plants are getting established.

38. The proposed planting will be denser than the existing and in the medium to long term will significantly improve aesthetics and screening along the route.

7. Land Use

39. The predominant land use in the acquired right-of-way is agriculture. The remaining areas are either dryland unsuitable for agriculture or commercial land.

40. Land acquisition has been restricted to 20 m wide on average, except at junctions, realignments, and bypasses where acquisition is 60 m. In urban areas, land acquisition is limited by the use of concentric widening with a narrow median. At four locations, bypasses will be constructed to totally avoid significant demolition of houses and buildings.

41. Service roads/side roads parallel to the national highway will serve as connector and feeder roads for the local communities. They will increase safety by separating the local slow-moving traffic from the fast traffic on the main road and by limiting and controlling the junctions onto the main road. Cross movement of the local traffic between service/side roads on each side of the national highway will be accommodated in underpasses and box culverts and bridges widened to provide for vehicles. Causeways at watercourses will be built on the service/side roads.

42. These measures will ensure that the new dual carriageway will not keep the local communities apart and slow-moving local traffic need not join the fast-moving traffic on the new highway.

43. During design development the public expressed concern regarding the impact of the proposed widening on two historical tanks near Chitradurga (Km 202–204). As a result, the design was restricted to a reduced width of right-of-way, thus avoiding the need for land acquisition within these tank beds.

8. Noise

44. Traffic on the widened and improved road will flow more smoothly. As a result traffic noise will become a component of ambient noise, which is less intrusive than the erratic increases in noise levels associated with congested single carriageways and substandard pavement designs. A noise model is being developed to predict noise levels for the project.

45. The survey of existing noise levels in villages and built-up areas generally shows the need for noise attenuation. The proposed design therefore calls for concrete or masonry walls 1.5 m high between the main carriageway and the service/side road.

46. At 32 locations, 2 m high walls will reduce noise for owners of specific buildings such as hospitals, schools, and health centers where noise levels already are at undesirable levels.

47. During construction, the contractor will be required to deploy plant and equipment not older than five years and to regularly maintain them. Construction work in the urban and other settlement areas will be restricted to daytime hours.

9. Vibration

48. The State Department of Archaeology identified the ramparts of a ruined fort at Aimangla (Km 178–179) as having historical importance, though they do not comprise a protected or

declared monument. It is within 30 m of the existing right-of-way and may experience vibration due to passing traffic.

49. To limit the vibration and its effect on the building, a 2 ms deep buried cutoff wall of loose-grained sand will be constructed within the right-of-way. This type of mitigation has successfully attenuated vibration caused by trains in India.

10. Air Quality

50. The draft IEE report indicates that implementing the Project is likely to improve air quality because vehicles on the project road will be able to travel at higher speeds with less emissions.

51. The air quality survey shows that 5 of the 16 samples exceed the threshold levels for suspended particulate matter. The samples were from congested urban areas or at junctions where average traffic speed is 20–40 kilometer per hour (kph). With the project providing grade separated interchanges and bypasses, it is expected that these average speeds will increase to 80–100 kph, with a resulting reduction in emission levels.

52. At present, properties are 10–15 m from the centerline of the existing road. The proposed design increases the distance to 23.5 m in urban areas. Research in other countries indicates that concentrations of emissions decrease significantly with distance.

53. NHAI consultants are developing an air quality model to more accurately predict emission levels for the Project and the resulting impact on the adjacent environment.

11. Shrines

54. A small number of small shrines, idols, and tombs falling within the proposed right-of-way will be relocated in consultation with the local community leaders. Initial indications show that there will be no objections to the proposals.

12. Environmental Management Action Plan

55. The NHAI design consultant prepared an environmental management action plan (EMAP) which summarizes the mitigation proposals and assigns the responsibility for implementing, testing, and monitoring during the construction phase and during the first five years of the operation of the project.

E. Institutional Requirement and Environmental Monitoring Program

56. The project implementation unit (PIU) of NHAI will manage and monitor the environmental elements of the five construction packages through the supervision consultants. Suitable provisions in this aspect have been made in the draft terms of reference.

57. The contractors will be required to appoint their own environmental officer to be responsible for their environmental obligations under the contract and for their general obligations under relevant laws and regulations. The contractors' and the supervision consultant's environmental officers will liaise on all matters relating to the environment.

58. NHAI will also appoint a part-time environmental adviser who will have an audit role for the environmental works and will advise on any matters that are outside the experience of the contractors or the supervision consultants.

59. An accredited laboratory appointed by the contractor under the construction contract will carry out sampling and testing. The contractor will be responsible for undertaking sufficient and adequate environmental testing to demonstrate to NHAI and to the environmental auditor that he is complying with all his contractual and legal obligations.

60. NHAI proposed to arrange at least two environmental training seminars during the construction period. NHAI staff and the contractor will be required to attend.

F. Findings and Recommendations

61. Reconstruction and widening of road are likely to have significant long-term benefits for all road users and for inhabitants of settlements near the road. Road users will benefit from reduced travel time, vehicle operating costs, traffic congestion, and road accidents and will save fuel. Local residents will have increased economic and employment opportunities, improved access to services and facilities, reliable transport services for freight traffic, reduced noise levels, and improved air quality. The provision of service/side roads interconnected by underpasses will remove the conflict between slow nonmotorized traffic and fast motorized traffic for local residents and thereby make their daily lives safer.

62. Because the project is a widening scheme with an average additional land width of 20 m, direct adverse impacts on the physical, biological, and socioeconomic environments will be few. Adverse impacts on the biological environment include reduced vegetation in the short term while the new planting is getting established. Negative socioeconomic impacts include possible disruption of utility lines, accident risks during construction, risk of communicable diseases transmitted through contact of residents with road workers and drivers of freight trucks, and disruption of community cohesion and the social fabric.

63. The project is judged to have some environmental impact, but the mitigation proposals reduce their significance. There are no permanent long-term significant impacts and therefore the project is assigned to category B. An EIA is not required.

G. Conclusions

64. Reconstructing and widening the existing highway will have positive impacts by improving regional transport links and increasing economic opportunities for local residents. The adverse impacts of the project will be mitigated to acceptable levels based on the IEE prepared by the NHAI design consultants, which will be supported by the EMAP. The EMAP will be sufficiently detailed to clearly provide for enforceable action to be undertaken by the contractor. It will also guide NHAI in protecting and conserving the environment while operating and maintaining the finished dual carriageway.

SUMMARY RESETTLEMENT ACTION PLAN

A. The Project

1. The western transport corridor (WTC), comprising National Highway No. 8 (NH8) and NH4, connecting Delhi, Mumbai, Bangalore, and Chennai, is one of the busiest corridors in India. The section between Bangalore and Mumbai falling within NH4 also has high traffic intensity. To decongest this stretch, the National Highways Authority of India (NHAI) with financial support from the Asian Development Bank (ADB) is preparing plans and designs to widen and strengthen the 259-kilometer (km) stretch between Tumkur and Haveri on NH4 in Karnataka State.

2. The Project aims to remove capacity constraints and improve road safety on critical sections of the WTC between Tumkur and Haveri. Some stretches on the WTC are already four lanes, widening work is in progress on some sections, and plans for the remaining stretches include development by other sources like private investment, own resources, multilateral funding, etc. Contracts for civil construction for the entire section are set for award by October 2001, with completion by June 2005.

B. Project Area

3. The project highway starts at Km 75 (Tumkur) and ends at Km 340 (Haveri) of NH4 in Karnataka State. The existing NH is a two-lane single carriageway. It traverses 128 villages, which abut the project road in the districts of Tumkur, Chitradurga, Davangere, and Haveri. A four-lane bypass to Sira town between Km 116 and Km 122 is being developed through NHAI's own resources; construction work commenced in August 2000. Similarly, the 30-km stretch between Bangalore and Neelmangla is already four-lane and the Neelmangla-Tumkur section is planned for development through build-operate-transfer scheme.

4. The right-of-way (ROW) defined for the project is 60 meters (m) in the rural areas and 47 m in the built-up areas. Existing ROW varies between 30 m and 50 m. The stretch consists predominantly of agricultural land and industrial centers at Tumkur and Davangere. The other main built-up areas are commercial centers along the stretch.

C. Land Acquisition Policy Framework

5. The Land Acquisition Act of 1894, with amendments, governs land acquisition in the country as a whole. The act defines parameters for identifying and compensating for acquired lands in India. Although a national resettlement and rehabilitation policy is under formulation, the central and the state governments have developed and applied resettlement action plans (RAPs) on a project-specific basis. For NHs, land acquisition is governed by the National Highways Act of 1956, which incorporates provisions of the 1894 Act. With a view to facilitate highway improvements, the NH Act was amended in 1997 and the procedure for land acquisition was simplified considerably.

6. The RAP for this Project is guided by ADB’s policy on involuntary resettlement, approved in November 1995, and based on a full census of the project-affected persons (APs). The census was conducted in three rounds: first in April/May 1999, prior to finalizing alignment; second in June-October 2000 after finalizing the alignment; and third in December 2000 for the remaining (15 percent) APs. The objective of the RAP is to minimize the adverse impacts of

road construction and improvement on the APs. The RAP identifies (i) the extent and nature of losses of the APs, (ii) the policies and legal framework, (iii) provisions made for compensation payments and relocation, and (iv) accountability in implementing the RAP. The RAP has been discussed extensively with the APs and NHAI.

7. The basic principles on which the RAP was developed include (i) avoiding involuntary resettlement wherever feasible, (ii) minimizing of resettlement where population displacement is unavoidable, and (iii) ensuring that displaced people receive assistance so that they are at least as well-off as they would have been in the absence of a development project. On the basis of the rules and regulations at the state and national levels as well as policies and practices for resettlement planning and management in externally financed projects, compensation for the APs will be in the form of either land or cash, or both.

D. Project Impact

8. A total of 541 privately owned structures will be acquired. As a result, 541 families and 3,246 persons will be affected. Of the privately owned structures, 204 will be fully acquired and 337 partially acquired. In addition, 310 families and 1,860 persons without title will be affected by the acquisition of 310 structures. The project will also acquire 1,514 acres of privately owned land, with effect on 3,151 families or 18,906 persons. Total acquisition of their lands will affect 74 families. In addition to privately owned land, 87 acres of government land will be acquired by the Project. A total of 27 government owned structures will be acquired. They include social infrastructure such as schools, clinics, and government offices.

E. Entitlements

9. A detailed entitlement matrix was developed setting out the losses, compensation, entitlements, and accountabilities associated with impacts under the Project. Land losses suffered by the APs have been categorized under two heads: (i) APs losing a part of their houses, and (ii) APs losing entire houses. Provisions have also been made for loss of orchard lands and private factory lands. In general, compensation at market rates will be paid to persons losing lands. Compensation for loss of structures has been computed at current construction (replacement) cost levels. Income losses will be compensated accordingly. The cut off date for eligibility for entitlements is the date of completion of the census surveys for nonholders of titles (April-May 1999 for Tumkur-Harihar section and December 2000 for Harihar-Haveri section) and publication of notification under section 3A(i) of NHAI act for landowners.

F. Organizational Arrangements

10. NHAI is the Executing Agency for the Project. The project implementation unit (PIU) of NHAI will supervise all planning, implementing, and monitoring activities associated with the RAP. The unit will be headed by the project director of the level of general manager. The PIU will have a resettlement cell for each district, which will be supported by district-level committees comprising representatives of district administration, revenue, panchayats, APs and nongovernment organizations (NGOs).

G. Implementation of the RAP

11. NHAI will engage the services of NGOs to provide counseling to APs and assist in implementing the RAP, particularly in disbursing compensation packages as prescribed in the

entitlement matrix. NGOs will play an important role in ensuring that legitimate grievances of the APs are redressed and vulnerable groups among the APs are given special attention.

12. RAP implementation, including land acquisition, will be completed within 18 months from the start of the Project.

H. Redress of Grievances

13. Grievance redressal committees (GRCs) will be formed at each district. APs who have grievances at any stage of implementation of the RAP may submit their grievances to the GRC. The GRCs will comprise the project director (NHAI); district commissioner or his representative; AP/Project displaced persons (PDPs) local representative; resettlement officer (NHAI); competent authority for land acquisition; NGO representatives; and panchayat/village level representatives.

I. Budget

14. The budget, which includes land acquisition and resettlement costs and services of NGOs, is estimated at Rs750 million.

J. Monitoring and Evaluation

15. Monitoring will be continuous throughout implementation of the RAP. A high-powered committee comprising of secretary-level officers of state and NHAI will monitor the functioning of the district-level committees and GRCs and also the overall implementation of the RAP. The PIU will submit quarterly progress reports to the NHAI headquarters, which will then submit them to ADB. Monitoring will be carried out for three years from the date of the implementation of the RAP.

16. A suitably qualified external agency will be hired to monitor and evaluate the resettlement activities.

TECHNICAL ASSISTANCE FOR ENHANCING THE CORPORATE FINANCE CAPABILITY OF NATIONAL HIGHWAYS AUTHORITY OF INDIA

A. Background

1. Faced with the enormous financing needed to upgrade a 13,000-kilometer (km) of arterial national highway network, the Government of India decided to take a number of bold policy actions to facilitate highway financing. The first major action was the establishment of a dedicated road fund (DRF) in 1998/99, which is expected to generate Rs20 billion ($444 million) per annum for the national highway segment. To maximize the leverage of the fund allocated from the DRF, the Government has further decided to let National Highways Authority of India (NHAI) to use the fund not only for direct payment for construction but also for debt services for bonds issued or to be issued. This would enable NHAI to raise approximately six times more money from the capital markets compared with the direct use of DRF money. However, this, in turn, requires NHAI to mobilize funds from capital markets in a more aggressive and diversified manner (a larger scale and better terms).

2. In line with this Government decision, NHAI has already issued 7-year domestic bonds with a put/call option after three years. The first issue, in 2000, raised Rs5 billion ($111 million) for NHAI. The second bonds were issued as an on-tap issue in February 2001. Both issues carry a triple A rating by virtue of their implicit government guarantee. There are plans for raising another approximately Rs120 billion ($2.5 million) through a series of bond issues. While the first two issues were made through private placement, subsequent issues may need to be issued to a broader range of subscribers (public placement). These larger and sequential issues of bonds are likely to exceed the absorptive capacity of the domestic bond markets and would cause crowding out of other institutions from Indian markets. Unless NHAI seeks to mobilize funds from foreign capital markets, the current financing strategy may not be sustainable. NHAI should look more closely at the possibility of issuing bonds in offshore markets more closely. This possibility will require NHAI to disclose more financial information to the public so that potential investors can make informed decisions.

3. While this direct borrowing would bring a significant amount of funds to NHAI, it would still not be sufficient to implement the huge tasks mandated by the Government. It will be necessary for NHAI to develop other methods of financing from the capital markets. NHAI has already been pursuing build-operate-transfer schemes and has begun to explore the possibility of securitizing the future revenue through special-purpose vehicles (SPVs). In fact, NHAI has already established several SPVs for the construction of highway links connecting to major traffic generators such as ports. It plans to sell its shares in these companies once they have demonstrated their revenue-generating capability.

4. These new alternative financial instruments should be implemented under an overall fund mobilization strategy. Over the longer term, NHAI should examine alternative forms of organization that would enable it to pursue more sophisticated financing operations. The current form of NHAI (an operational arm of the government specializing in highway development and maintenance) has imposed a number of constraints on its strategic option for fund mobilization. Relative merits and demerits of the current and alternative forms of organizations should be compared in a systematic manner so as to identify the most suitable form of organization, which could effectively perform NHAI mission mandated by the Government.

B. Technical Assistance

1. Objective

5. The primary purpose of the proposed technical assistance (TA) is to strengthen the fund mobilization and financial management capability of NHAI. The study also aims to facilitate the transformation of NHAI into a more efficient and autonomous organization, including the possibility of corporatization.

2. Scope

6. The proposed TA will be carried out in two stages to address the two objectives in sequence.

7. *The first stage activities* are designed to meet the NHAI's immediate need to strengthen its fund mobilization and financial management capabilities. More specifically, it would consist of three supports for: (i) capital mobilization; (ii) treasury function; and (iii) financial reporting system:

(i) Support for facilitating capital mobilization. This component would assist NHAI in developing a general strategy for financing road investments and evaluating alternative financial instruments both currently available and realizable in the medium term. The financial instruments currently under consideration by NHAI include: special purpose vehicles (SPVs), bond financing, and other forms of revenue securitization. The relative costs for these instruments would be determined and the potential size of the market for these instruments would be estimated. Also the available mechanisms for credit enhancement would be explored including different forms of third party guarantees. Criteria and analytical procedures would be developed for matching road projects and financing options based on explicit objectives. Based on these analyses, specific opportunities would be identified, and then specific implementation plans, developed for each specific opportunity.

(ii) Support for enhancing the treasury function. This component would aim at developing a strategy for placement of funds to maximizing the yield, while ensuring adequate liquidity. Performance measures would be developed to monitor performance of the funds placement. This component would also aim at strengthening its treasury function in a more general manner. The procedures for collection of tolls revenues and payments for construction, service contracts, and debt service would be reviewed to ensure both reliability in meeting obligations. A financial planning model would be developed in which alternative investment options would be evaluated along with the projection of cash flows related to construction activities, debt financing, government grants and Cess revenues and operating revenues and expenditures. The model would be used to evaluate various allocation of funds in terms of liquidity and return (which would also be utilized for comparing various development scenario in the second stage study).

(iii) Support for upgrading the financial reporting system. This component will aim at strengthening NHAI's accounting and financial reporting system. Accounting standards and policies should evolve as NHAI's financing operations become

sophisticated. Since the current bond issues are still on a private placement basis, the current Government-regulated financial statements of NHAI have been accepted by the market. However, as the scale of fund mobilization gets larger (NHAI should consider first the public issuance of bonds in domestic markets, then issuance of bonds in offshore markets), accounting standards and policies, together with the level of information to be disclosed, need to be upgraded according to the road map for modernization of accounting standards and policies (Appendix 8). The current accounting standards and policies should move to those consistent with, initially, Generally Accepted Accounting Practices of India (GAAP-I), and, then, with international accounting standards (IAS). The consultant should assist NHAI in its process through (i) reviewing the current government regulations over NHAI's accounting practices and developing recommendations on the necessary modifications to them; (ii) reviewing possible financing operations and identifying required accounting standards and the level of information disclosure for each type of financing operations; (iii) developing two sets of recommendations necessary for NHAI's accounting standards and policies to be upgraded first to GAA-I, and then to IAS; (iv) adding necessary modification to computer models to be developed with World Bank assistance so that NHAI can produce the necessary financial statements according to the adopted accounting standards and policies; and (v) training NHAI's staff to build the necessary institutional capacity for accounting and financial reporting.

8. The above activities would be preceded by the review of the current legal framework associated with ownership of the national highways (including the difference between "entrusted", "vested", "leased", or "owned"). The above activities will be supplemented by foreign study tours to those countries such as the People's Republic of China that has introduced the securitization and raising additional development funds from the capital markets.

9. The second stage activities will focus on broader and longer term issues. A major topic will be the future form of the organization with particular emphasis on how to transform NHAI into an efficiently managed and financially/managerially autonomous body such as a corporatized organization. The main activities will be the following:

(i) review the results/progress of the World Bank study on institutional development;

(ii) review the experiences of other countries with regard to forms of organizations that provide infrastructure through the public sector operating arm;

(iii) select possible alternative forms of organization and apply the strategic financial planning model to compare the existing and alternative forms in terms of financial performance;

(iv) develop a strategy for transforming NHAI into an efficiently managed and financially/managerially autonomous body; and

(v) hold a series of workshops on the future form of NHAI with participation of relevant agencies and the World Bank.

3. Required Qualification

10. Different qualifications are required for the first- and second-stage activities. The first-stage activities requires extensive knowledge on (i) capital markets both in India and in other countries; (ii) a variety of financing instruments including debenture, securitization of future revenue flow, special-purpose vehicles, and initial public offer; (iii) the treasury function including fund management; (iv) accounting policies and standards, both Indian and international; and (v) legal aspects including real estate law and public sector ownership issue. For the second-stage activities, extensive knowledge and experiences are required with regard to enterprise reforms, legal aspects of the Government organization and corporate law, and the process of corporatization.

C. Cost Estimates and Financing Plan

11. The activities will be carried out under a technical assistance associated with the Western Transport Corridor Project and through international consulting firms and/or a group of individual consultants. The consulting services will be engaged in accordance with the *Guidelines on the Use of Consultants* by ADB and other arrangements satisfactory to ADB for engaging domestic consultants. The TA for both first and second stages will require 15 person-months of international consultants and 15 person-months of domestic consultants. The total cost of the TA is estimated at $900,000 equivalent, of which ADB will finance $700,000 under the ADB-funded TA Program, and the Government the remaining $200,000.

12. The TA is expected to be for 12 months. The first stage activities will commence in February 2002 and be completed in September 2002, while the second stage activities will commence in September 2002 and be completed in February 2003.

D. Implementation Arrangements

13. NHAI will be the Executing Agency. It will establish a task force consisting of general manager-level experts of NHAI in charge of financing and accounting, institutional development and planning, and headed by Member (Finance). The second stage report will be reviewed by relevant ministries of the Government including the Ministry of Road Transport and Highways.

Table A12.1: Cost Estimates and Financing Plan

Items			Cost ($)
A.	**Asian Development Bank**		
	1	**First Phase**	
		a. Consultants	
		International	207,000
		Domestic	81,000
		Per Diem	54,000
		Travel	24,000
		b. Foreign Study Tour to China	
		Consultants	18,000
		Travel	30,000
		c. Communications and reports	8,000
		Subtotal	**422,000**
	2	**Second Phase**	
		a. Consultants	
		International	54,000
		Domestic	18,000
		Per Diem	18,000
		Travel	4,000
		b. Workshops	90,000
		c. Communications and reports	2,700
		Subtotal	**186,000**
	3	**Contingencies**	91,300
		Total (A)	**700,000**
B.	**Government Financing**		
	1	**First Phase**	
		a. Counterpart staff	57,600
		b. Studies, surveys, and reports	15,000
		c. Office space, vehicle, and other operations	28,800
		d. Communications	24,000
		e. Administrative Support	7,200
		Subtotal	**132,600**
	2	**Second Phase**	
		a. Counterpart staff	19,200
		b. Studies, surveys, and reports	4,000
		c. Office space, vehicle, and other operations	9,600
		d. Communications	7,500
		e. Administrative Support	1,200
		Subtotal	**41,500**
	3	**Contingencies**	25,900
		Total (B)	**200,000**
		Grand Total	**900,000**

ECONOMIC ANALYSIS

A. General

1. The economic evaluation of the Project was carried out for the with- and without-project scenarios. In the without-project scenario, the existing two-lane alignment was used. Congestion would increase steadily until practical capacities were exceeded. Traffic would then be diverted to available alternative routes. In the with-project scenario, the new four-lane alignment will allow improved traffic flow conditions, higher vehicle speeds, and shorter travel time translating into lower vehicle operating costs (VOCs). A six-lane scenario was considered, but the projected growth in traffic was not sufficient to justify this investment within the next 10 years. The project life was assumed to be 30 years during which additional capacity will be required. For the purpose of economic analysis, growth in traffic was capped at the capacity of the four-lane road, assuming that the additional traffic would be associated with the costs and benefits of future investments.

B. Costs

2. The economic costs of implementing the Project were estimated from the financial costs of civil works, physical contingencies, land acquisition for the right-of-way, and construction supervision. The construction was assumed to require four years during which two of the four lanes would be available. Immediately thereafter, tolling operations would begin. Price escalation provisions, interest during construction, and taxes and duties were deducted from the financial costs to derive the economic costs. The financial costs were converted into economic costs by using the factor of 0.85 to take into account taxes and the marginal costs for labor. Financial operation and maintenance (O&M) costs were also adjusted by the same approach to obtain economic costs.

3. Both alternatives will require regular maintenance during the operation of the Project. The maintenance costs were calculated as the difference between maintenance requirements for the new four-lane alignment and for the existing two-lane alignment would require. The maintenance costs for the new road are higher because of the additional two lanes and the higher standard of road construction and maintenance. This road was assumed to receive periodic maintenance every 7 years with a double overlay every 14 years. The existing road would receive a more frequent periodic maintenance, every three years, but with a lower quality overlay. The toll road will incur additional operating costs for toll collection and traffic supervision. All costs and benefits were estimated in constant October 2000 prices.

C. Benefits

4. The principal benefits of widening to a four-lane divided highway will be increased capacity, low VOCs, and reduced travel time. Without the widening, traffic above the capacity of the two-lane road would be diverted to more circuitous routes, if alternatives are available, or the trips would not be made. Savings in VOC would be due to higher average operating speeds and reduced road roughness. The increase in speed is estimated to be about 20 kilometers per hour for buses and trucks in most sections, and higher for automobiles. The higher operating speeds would reduce the VOC in terms of capital costs and the costs for drivers and assistants. Road roughness would be greatly reduced because the volume of traffic would be well below capacity and therefore damage would be less substantial. No allowance was made for the additional reduction in roughness due to better quality of construction and maintenance designed for these roads.

5. Considering vehicle and road characteristics, VOCs were calculated for six vehicle types (cars, utility vehicles/minibuses, buses, light commercial vehicles, heavy commercial vehicles, and multiaxle vehicles). The values were calculated using a variation on the HDM-III model designed for the Indian environment. This revised model, developed under an earlier Asian Development Bank technical assistance, includes operating costs for vehicles common in Indian roads, operating speeds commensurate with local driving habits, and road deterioration relationships based on experience with local roads. A sample of the vehicle costs computed for the Tumkur-Sira section of the corridor are in Table A13.1.

Table A13.1: Typical Operating Costs by Vehicle Type for Tumkur-Sira
(Rs/vehicle-km)

Vehicle Type	Car	Bus	HCV	MAV
Without Project	3.78	12.73	13.06	21.93
With Project	2.21	6.44	7.21	14.87
VOC Savings	1.57	6.29	5.85	7.06

Car= new technology Car, HCV = heavy cargo vehicle, MAV = multiaxle vehicle.

6. For the without-project case, it was assumed that traffic on the road would continue to grow and congestion increase until the practical capacity of the road was reached. At that point, traffic would either be diverted to alternative routes, if these were available, or the trips would not be made. In either case, the costs for the traffic that could not be accommodated would be equal to or greater than the cost for the traffic that would continue to travel the road. It was conservatively assumed that the benefits to this traffic would be the difference in VOC from traveling on the four-lane road and traveling on the two-lane road when operating at capacity.

7. The VOC saving were substantially greater than the tolls as shown in Table A13.2. This suggests that owners of commercial vehicles will be willing to pay not only tolls but also much higher tolls.

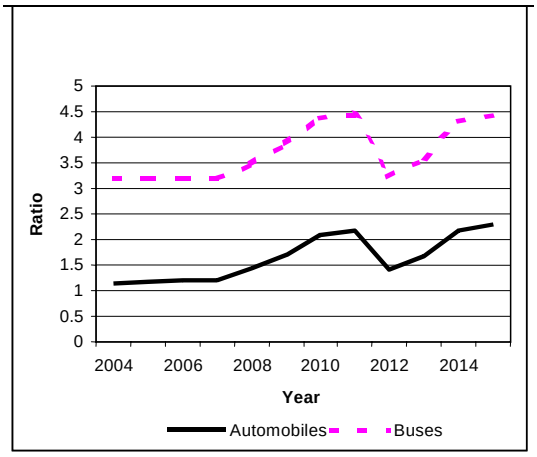
Table A13.2: Ratio of VOC Savings to Tolls

Vehicle Type	VOC/Toll
Buses	3.5
Light Truck	6.7
Heavy 2-Axle Truck	2.7
Multiaxle Truck	2.0

8. Time savings for passengers were not included in estimating benefits. A separate calculation was made assuming a value of time equal to one half the average wage for passengers. A higher income was assumed for automobile passengers than for bus passengers. These savings were found to add only about 4-5 percent to the economic internal rate of return (EIRR). However, these time savings are important for automobile passengers, since the decision to use a tolled road is presumably based on time savings rather than on

operating costs.[1] The same applies to passengers on buses in their choice of an express service. The comparison between tolls and time savings is shown for Chitradurga-Davengere. The average is about 1.60 for cars and 3.75 for buses. This demonstrates that even if passengers had an alternative slower, untolled two-lane route comparable with the current road, they would prefer to take the tolled road. The ratio increases as the traffic level increases (Figure A13.a).

Figure A13.a: Ratio of Time Savings to Tolls



9. A number of benefits were not included in this analysis: reduction in freight logistics costs with reduction in travel time and the ability to travel at convenient times, the benefits from generated traffic, and reduction in accidents. The slow travel time between major cities limits the growth in freight traffic. With increased travel speeds, producers will have more options for outsourcing production, wholesalers and retailers will be able to operate on tighter inventories and improve responsiveness to consumer demand, and transport operators will be able to rationalize the use of their fleets. Some of these benefits are captured in the reduced VOCs but the benefits that result from structural chains in production and marketing of goods and improved supply chain management are not. One of these is the greater freedom in scheduling the time of travel. At present the traffic flow on the two-lane road is relatively constant throughout the day. Trucks prefer to travel at night partly due to the curfews in the major towns but also to avoid the other traffic on the roads. Intercity buses also tend to travel at night. With an increase in road capacity, these trucks and buses will have greater flexibility in choosing their travel times to meet the demands of their customers.

10. Also not included in the benefits is generated traffic. Freight traffic will increase as the reduced travel time and cost allow producers to increase the size of the market in which they can compete. Nonbusiness passenger traffic will increase because the range of cities and towns that can be visited on nonwork days will increase. Business trips will be longer as commuting distances increase. Little growth is expected from traffic diverted from other modes since rail has lost most of its market to road transport and air travel remains extremely expensive.

11. The savings due to fewer in accidents are difficult to estimate because data on the number and type of accidents occurring along the western transport corridor are not readily available. An estimate prepared from statistics collected as part of an earlier national road user cost study produced the results in Table A13.3. The reduction in different categories of accidents could not be predicted. However, the divided road will significantly reduce the number of head-on collisions, which were assumed to cause about one half of the fatalities and serious injuries. The estimated value of the savings was smaller than the savings in VOCs. They would add only about 1 percent to the total benefits. The savings would be more substantial since accidents tie up traffic on the road and cause significant delays throughout the year. Furthermore, the number of accidents would increase as the two lane road becomes more congested. Finally, the value associated with these accidents is expected to increase as the

[1] Even out-of-pocket costs are difficult for road users to determine when comparing alternative routes. Presumably the decision to use tolled roads is based primarily on time savings.

values of vehicles, costs for injuries, and claims associated with loss of life rise faster than the rate of inflation. The savings will also be greater due to the efforts of NHAI to introduce better safety standards and to enforce laws on vehicle operation. These factors should provide benefits equal to 3-5 percent of the total.

Table A13.3: Parameters for Accident Cost Estimates

Type of Accident	Occurrence (per km-year)	Average Cost (Rs'000)
Fatal Accident	0.67	512.0
Serious Injury	0.31	80.0
Minor Injury	1.77	2.7
Vehicle/Property Damage	4.05	25.0

12. For estimating the EIRRs, benefits and costs were calculated for 30 years starting in 2001. This period covers construction and economic life of the improvements under the Project. Separate sections of the project road and the entire Project were evaluated. Because of considerable uncertainty regarding to the project parameters, a simulation was prepared using the VOC model. The parameters that were treated as stochastic included the forecasts of growth in gross domestic product and population, the elasticity of passenger and freight traffic, the initial traffic volumes (reflecting problems in reliability and location of traffic counts), the change in vehicle mix over time (for both freight and passenger vehicles), and construction costs. The probability functions used are summarized in Table A13.4.

Table A13.4 Probability Functions Used in Economic Analysis

Variable	Form	Notes
Population Growth	Normal	By 10-year period, Std. Dev.10%
GDP Growth	Normal	By 10-year period, Std. Dev.10%
Freight Elasticity w.r.t. GDP	Normal	Std. Dev. 10%
Passenger Elasticity w.r.t. GDP/Capita	Normal	Std. Dev. 10%
Average Truckload	Triangular	By truck category
Mix of Trucks by Size	Uniform	By 10 year period
Average Passengers/Vehicle	Triangular	By vehicle type
Mix of Passenger Vehicles by Type	Uniform	By 10 year period
Initial Traffic Levels by Vehicle Type	Normal	Std. Dev. 5%
Percentage of Through Traffic	Triangular	autos $\pm$7%, trucks $\pm$12%
Construction Costs	Triangular	-20%, +30%

GDP = gross domestic product, Std. Dev. = standard deviation, w.r.t. = with respect to.

13. The median value of the EIRR for the individual sections and the entire road are shown in Table A13.5. The high values for all sections reflect of the difficult situation currently prevailing on the road. The result of widening from two-lane undivided to four-lane divided will provide more than a 200 percent increase in effective capacity and will convert the corridor from one with relatively heavy, slow-moving traffic for significant portions of the corridor to one with

relatively free-flowing traffic with adequate capacity to absorb the expected increase in traffic in the next 10-15 years.

Table A13.5: EIRR for Road Sections in Corridor

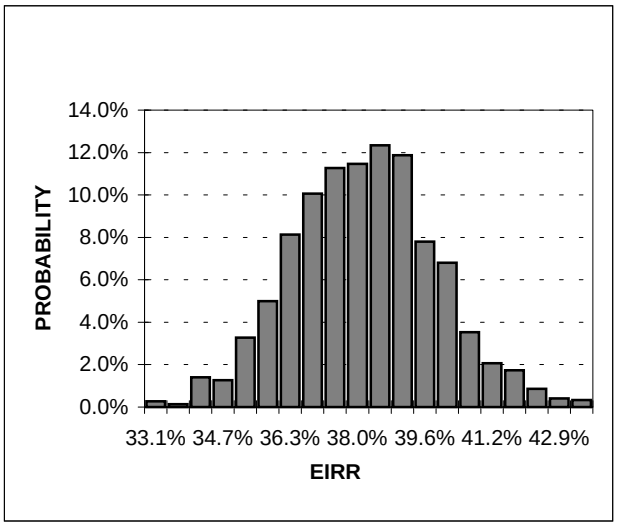
(%)

Section	5%	95%	Max
Tumkur-Sira	40	48	56
Raniben Bypass	25	34	43
Hiriyur-Sira	34	40	46
Hiriyur- Chitradurga	35	41	47
Haveri Widening	37	43	50
Haveri Bypass	30	34	39
Davengere-Harihar	23	27	32
Chitradurga-Davengere	30	35	41
Total Road	36	38	41

EIRR = economic internal rate of return.

14. The range of results from the sensitivity analysis are shown in Figure A13.b for the total road project and in Table A13.5 for the individual road sections. The median values were used to estimate the switching values for construction costs 129 percent and benefits 55 percent.

Figure A13.b: Distribution of Economic Internal Rate of Return



POVERTY IMPACT ASSESSMENT

A. Overview

1. A domestic consultant engaged by the National Highways Authority of India (NHAI) assessed in 2000 the probable consequence of upgrading the NH4 Tumkur-Haveri section on poverty the influence areas of the Project. The thrust was to understand and measure the impact of the Project on the people, particularly on the economically and socially underprivileged sections of the population, who generally constitute the poor and the very poor.

B. Approach

2. The Government of India recently launched a program to rapidly upgrade the entire road system comprising national highways (NH), state highways, and district and rural road networks. The Asian Development Bank's (ADB's) assistance to the Western Transport Corridor (WTC) Project is part of its contribution to the Government's overall efforts to upgrade the entire road network. This study of the impact on poverty, therefore examined poverty impact issues from a broader perspective, including the issue of rural connectivity and the project impact on the local community including the scheduled caste (SC), scheduled tribe (ST), and women.

C. The Project Area

3. The 259-kilometer (km)-long Tumkur-Haveri highway is part of the NH4 in the southern part of India; it connects two major ports, Mumbai, and Chennai. Tumkur is situated 70 km north of Bangalore. The Tumkur-Haveri section starts at the north end of Tumkur (Km 75); traverses the towns of Sira, Hiriyur, Chitradurga, Davangere, and Harihar; and ends on the north point of Haveri town (Km 340). The landscape is characterized by vast stretches of undulating plains with sporadic ranges of low rocky hills. Areas are basically dry with occasional rivers running between hills. Most are open land often used as plantations and for other agricultural purposes. Around 5 percent of the land is forest area. Project roads traverse a number of small towns and villages.

D. Poverty Profile

4. According to the consultant's study conducted in 2000, poverty incidence in Karnataka is 33.2 percent, which is lower than the national average (36.0 percent).[1] Poverty presents comparatively less problems in Karnataka, but the issue is the intrastate disparity in poverty level. Poverty incidence in the project districts range from 39.0 percent in Chitradurga to 49.7 percent in Haveri (Table A14.1).

[1] The latest National Sample Survey in India conducted in 2000 and published in 2001 indicated that the national average of the proportion of population living below poverty line has been reduced from 36.0 percent in 1993/94 to 26.0 percent in June 1999/2000.

Table A14.1: People Below the Poverty Line in Karnataka, by District 1993-1994

District	Rural		Urban		Total	
	%	Rank	%	Rank	%	Rank
Bangalore	12.40	4	32.51	4	31.42	12
Bangalore Rural	42.20	15	26.69	2	38.17	13
Belgaum	27.17	12	41.98	11	29.86	10
Bellary	43.75	16	46.86	13	44.50	16
Bidar	57.00	20	56.35	19	56.06	20
Bijapur	19.31	8	55.40	18	28.98	9
Chikkamangalur	11.11	3	27.80	3	15.61	3
Chitradurga [a]	40.11	13	36.64	7	39.00	14
Dakshina Kannada	06.68	1	15.71	10	8.91	1
Dharwad [b]	47.46	18	52.22	17	49.75	19
Gulbarga	45.81	17	45.94	12	45.54	17
Hassan	09.50	2	35.08	6	14.44	2
Kodagu	15.24	5	40.38	10	20.73	4
Kolar	47.93	19	50.71	16	48.45	18
Mandya	23.89	10	65.72	20	30.16	11
Mysore	26.64	11	33.82	5	28.94	8
Raichur	18.72	7	50.00	14	25.11	6
Shimoga	16.06	6	50.66	15	25.56	7
Tumkur	42.18	14	36.98	8	40.64	15
Uttara Kannada	20.10	9	38.70	9	24.97	5
State	29.88		40.20		33.16	

[a] The old Chitradurga district included Davangere and Harihar sector.
[b] The old Dharwar district included Haveri sector.

Source: Human Development in Karnataka.

5. The population breakdown along caste, sex, and rural/urban areas of the three districts (currently five due to the bifurcation of two districts) in Table A14.2 reveals significant number of the disadvantaged such as the SCs and STs who form a major section of the poor. Households with female heads are relatively more impoverished because of their greater vulnerability to poverty. Showing these sections is crucial in a study of the impact of the National Highway Project on poverty.

Table A14.2: Demographic Details of the Project Districts of the National Highways Project

District	Area (km^2)	Population						
		Total	Men	Women	Rural	Urban	SC	ST
Tumkur	10,598	2,305,819 (100)	1,177,233 (51.0)	1,128,586 (48.9)	1,923,656 (83.4)	382,163 (16.6)	408,524 (17.7)	167,632 (7.3)
Haveri	4,851	1,269,213 (100)	655,426 (51.6)	613,787 (48.4)	1,065,448 (83.9)	203,765 (16.1)	167,004 (13.2)	61,169 (4.8)
Davanagere	6,018	1,559,222 (100)	803,083 (51.5)	756,139 (48.5)	1,118,714 (71.8)	440,508 (28.3)	302,344 (19.4)	155,600 (10.0)
Chitradurga	8,388	1,312,717 (100)	672,849 (51.3)	639,868 (48.7)	1,095,247 (83.4)	217,470 (16.8)	285,621 (21.8)	222,763 (17.0)
Total	**29,855**	**6,446,971 (100)**	**3,308,591 (51.3)**	**3,138,380 (48.7)**	**5,203,065 (80.7)**	**1,243,906 (19.3)**	**1,163,493 (18.0)**	**607,164 (9.4)**

Km^2 = square kilometers, SC = scheduled caste, ST = scheduled tribe.
Note: Figures in parenthesis indicates percentages. Davanagere includes Harihar.

6. Most villages in the Indian context are multicaste and heterogeneous in nature. The largest population of the poor and the very poor are SCs and STs who constitute the lowest rank in caste hierarchy. These vulnerable groups of the society are physically and socially segregated from main villages have limited access to basic amenities, which are by and large located in the main village. The time of SC/ST use of the commonly used amenities differs from that of the dominant groups of the village.

7. The SCs and STs in the project districts account for 27.4 percent, which is higher than the state average (21 percent). The poverty-related socioeconomic indicators (Table A14.3) are uniformly higher for the SC and ST communities regardless of the extent of deprivation. Adequate health and educational infrastructure related to the socioeconomic profile of the region is both a cause and consequence of development. The principal measures of health status include sex ratio and life expectancy at birth. Educational status is measured using literacy and enrollment rates. Issues of equity remain critical: access to these basic facilities is uneven across the state and gaps in related infrastructure are wide.

Table A14.3 Socioeconomic Indicators of the Project Districts

District	Real GDP per capita (PPP$)	1991 Sex ratio	Life Expectancy	Literacy Male	Literacy Female
Tumkur	867	959	60.64	66.5	41.9
Haveri	881	936	62.78 [a]	64.5	39.4
Davangere	961	942	61.92 [b]	66.8	44.4
Chitradurga	961	951	61.92	68.0	43.3
State Average	1135	960	62.07	66.5	42.3

GDP = gross domestic product, PPP = purchasing power parity.

*Haveri was part of the old Dharwad district hence Dharwad data is used.
*Davangere was part of the old Chitradurga district, hence Chitradurga data is used.

F. Transport and Poverty

8. The NH4 is primarily used for interstate traffic connecting the major cities enroute and also for intrastate and local transport. The towns and villages located on the highway or close to it necessarily use the NH4 for all activities, including for going to the weekly markets. The villages and towns located farther away from the NH4, however, are connected to the state highway and the district roads. Often a section of the NH4 is used in commuting, particularly if the commuters have to reach the district headquarters or the cities for their work. Maximum use, however, is by local traffic, popularly known as the route transport, connecting several villages to the taluk and district headquarters.

9. In the weekly markets, the communities purchase and sell commodities. Particularly for the poor, these markets provide the space for exchange of goods. The weekly market days are timed soon after the poor receive their wages. The NH4 is also used to access district/large town hospitals for emergency health care. During migration in search of employment opportunities to the neighboring cities and states, the poor use the NH4. In most districts the centers of higher learning/vocational training centers are located in towns and district headquarters; and therefore, increased connectivity will improve the access of the poor to these institutions. Vocational training centers are gaining popularity as they increase job opportunities for the poor. Sometimes they are used for social and religious reasons.

10. Recognizing the importance of the rural road network to link villages with mainstream development, the Prime Minister recently announced an accelerated development program for rural roads. The target is to link all villages with population of more than 1,000 to major road networks by all-weather roads by 2003 and those of more than 500 population by 2007.

G. Poverty Programs

11. The Government, independently as well as with bilateral or multi-lateral sources has undertaken various programs to address poverty. The most recent one is the special economic programs to form self-help groups among rural women. The idea is to mobilize women and improve their quality of life. The programs for reducing poverty are in four broad categories: area development programs, special economic programs (self-help groups), rural energy program, rural water supply and sanitation programs.

12. The programs have good objectives but face serious limitations. In most cases, the benefits arising from the schemes do not reach the most deprived sections of the society for those reasons: information regarding the schemes is lacking; most of the infrastructure benefits are both spatially and socially distant from them. Poor communication networks, including roads and the irregular and limited transport facilities aggravate the situation. The social dynamics of caste and class hierarchies along with unequal gender relations are major obstacles in the flow of benefits to the poor. Lack of coordination between the various implementing departments of the government and other organizations prevents the schemes from reaching the marginalized. Hence, there is a need to create facilitating mechanisms, local community networks, and, finally, the political will to ensure that the benefits reach the poor.

H. Community-Based Assessment

13. A community-based assessment was carried out in nine villages located at varying distances from the highway - up to a distance of 25 km on either side - and representing five districts: Tumkur, Chitradurga, Davanagere, Harihar and Haveri. The sample comprised 332 people: 228 men and 104 women. To collect information and gain insights into the probable impact of the project on the communities, particularly the poor, participatory rural assessment techniques were used These are interviews with primary informants, focus group discussions, transect walks, participant observation, and participatory poverty and social mapping. Information was also collected from secondary sources.

14. The major findings are summarized below.

(i) All sections of the society irrespective of caste and class supported the project plan to broaden the NH4 corridor. They expected the project to make a significant impact on their lives by raising the standard of living and reducing poverty in their villages.

(ii) Road users including commercial operators, i.e., small businessmen and mini-transporters, viewed the broadening of the NH4 as leading to improved linkages, reduction in travel time, decrease in the number of accidents, lower maintenance costs, easier commuting, rise in income, and increased opportunities for investment.

(iii) The majority of the truck drivers, who are often individuals using trucks owned by others and who are also generally classified poor, expected the higher number of trips they make, lead to better social security, including compulsory insurance to be borne by the truck owners.

(iv) For the agriculturists it meant improved transport linkages to big markets, leading to higher returns for their produce, increased land value, and a change in cropping pattern resulting in higher income. It also meant reduced cost of inputs and supplies, and transportation, that is efficient and safe.

(v) Local communities expected benefits to accrue to them through better access to education and job opportunities. Expanding economic opportunities for the poor means better bargaining power to negotiate for higher wages.

(vi) For the dalits and women, the project will positively impact their livelihood by improving their access to basic amenities like basic education and adequate health facilities, easy mobility, better employment opportunities with increased wages, and easy access to markets. It will increase the opportunities for setting up production units to create alternative employment for unemployed youth and women.

(vii) The poor SC/ST communities within the village are often hamlets/colonies geographically and socially remote from the main village. They expect that, unless conscious efforts are made to integrate them into the developmental processes, they cannot enjoy the potential benefits to be created by a better road network, nor access to various developmental programs initiated by the governments.

(viii) Elected representatives and local leaders were positive about the project and expected the flow of improved services from the government and other agencies.

I. Impact on Poverty Reduction

1. Quantitative

15. The poverty impact ratio was calculated, but due to limited information, the results of the calculation were not adequately substantiated. Instead, more specific efforts were made to quantify some impact of the Project on poverty.

16. The construction of a four-lane road between Tumkur and Haveri will generate employment for the population along the route. Unskilled labor will be employed directly in road construction and maintenance and indirectly by providing material and services to the construction and maintenance activities. Unskilled labor for constructing a kilometer of the four-lane highway is estimated to amount to 2,175 person-days (Table A14.4). The road contractor will bring along some of his unskilled labor from previous jobs, the rest will be obtained locally. The percentage of local labor will depend on the cost to the contractor employing local labor. To reduce this cost and encourage a high local labor component, it is proposed that village

organizations be utilized to recruit labor and guarantee their performance.[2] The additional labor generated during construction will prepare materials at quarry sites, transport materials to the site, and provide food and other supplies for the workers. This is expected to add 33-50 percent.

Table A14.4: Unskilled Local Labor for Construction

Item	Unskilled Activity	Unit	Output/ Person-Day	Average quantity/km	Person-days/km
Tree felling and Cutting	Cutting, stacking, carrying	no.	0.33	77	233
Demolishing buildings	Sorting demolished materials	sq.	10	520	52
Demolishing bridges	Sorting demolished materials	m^3	0.5	90	180
Tack coat	Clear surface	m^2	100	20,000	200
Concrete	Cleaning formwork, watering	m^3	4	1,000	250
Reinforcement	Carrying, holding, tieing	ton	2	1,050	525
Mastic coat to deck	Cleaning, carrying	m^2	10	50	5
Paving flags	Carrying, mixing, tidying	m^2	5	100	20
Erosion apron	Carrying, mixing, tidying	m^3	2	250	125
Stone pitching	Carrying, mixing, Tidying	m^3	1	50	50
Topsoil	Spreading, leveling	m^2	10	1,400	140
Masonry wall	Carrying, mixing, Tidying	m^3	1	300	95
Fencing	Carrying, tidying	m	20	1,900	95

m = meter.

17. The contractors responsible for road operation and maintenance will also require casual unskilled labor on a continuing basis for routine maintenance of the pavement, shoulders, and associated civil works. The level of employment will be lower but over a longer period, and will involve a higher proportion of local labor. It is estimated that the average annual level of employment will be 2-3 person-years per km. In addition, there will be another 3-4 person-years every seven years when periodic maintenance is conducted.

[2] Contractors are often reluctant to use local labor because they are viewed as unreliable.

18. The annual amount of unskilled labor required by the Project is expected to be about 1,000 person-years during construction and 750 person-years thereafter. The distribution of these jobs between the local residents above and below the poverty line will depend on the recruitment effort. If equally distributed according to the population breakdown, this will amount to about 400 person-years during construction and 300 person-years thereafter for those below the poverty line.

19. In addition, considerable secondary employment will be generated to meet the needs of expanded transport activity. This will mean expanding of services for truck drivers and bus passengers by including restaurants, fueling and vehicle repair facilities, and parking areas.

2. Qualitative

20. The principal benefit to the rural populations in the project area is the opportunities provided through increased connectivity. However, the breadth of these benefits will depend on the development of the rural road network. These roads are not in good condition and often do not reach the poorest villages. The fuel taxes used to fund the NHAI development program will also provide funds for developing of the rural network. This will allow the more isolated villages to be better connected to the taluk and district centers as well as the major cities. The benefits will be substantial since the economic isolation of many of the poorer villages along the project route will end.

21. Improved transportation will improve the distribution of social services from the Karnataka government to the villages along the project road. This will include better support for the local medical clinics and educational facilities. At the same time, village access to the hospitals and health-care facilities in the large towns and district centers for emergency health care will improve.

22. The communities located along and close to the NH4 use it for visiting the weekly market, where they buy and sell commodities. These markets provide the poor, the space for exchange of goods. Market days are timed soon after the poor receive their wages. The reduction in transport costs and travel time will allow the poor to seek employment in neighboring cities and states.

23. In most districts the centers of higher learning/vocational training centers are in towns and district headquarters. Increased connectivity will improve access to vocational training centers, which increase job opportunities for the poor. Centers are sometimes used for social and religious purposes.

24. Approximately three-quarters of the local workforce are currently engaged in either agriculture or some form of manufacturing/processing. The road also offers a better connection to central markets for the sale of local agricultural and other resources.

J. Conclusion

25. The immediate project benefits that will accrue to the poor, who struggle for their livelihood on a day-to-day basis will not be a large portion of the total benefits to the rural population. This is not surprising, given the level of the poor's participation in rural economic activity; however, the benefits will increase substantially over time. The short-term, immediate, visible benefits are better articulated and include construction works, maintenance works, tree

planting, provision of services, etc., that offer immediate income-earning opportunities to the rural poor. The wage income emanating from agriculture fluctuates over time due to seasonality of operations. However, the project will generate ample employment opportunities for skilled and unskilled labor during its implementation phase. The project will have positive externalities, which will improve the livelihood of the poor.

26. More important are the long-term impacts of the project, which include the narrowing down of intradistrict disparities and reduction of poverty. Providing the poor with better access to services and economic opportunities available in the larger towns and cities is a necessary condition for economic development of poor communities. An improved road network, including primary and feeder roads, will increase economic opportunities for the poor, the unemployed youth, and women. It will also augment the inflow of social benefits such as access to better health services, education, and other public services.