ESMF DISCLOSURE BY MoUD

To encourage application of the National Urban Transport Policy in India's urban transport systems in favour of sustainable development, the Ministry of Urban Development (MoUD), GoI has applied to the Global Environmental Facility (GEF) to implement GEF's Sustainable Urban Transport Project (SUTP) in India. The GEF grant (of USD 25million) will be complemented with a grant of USD 150 million from GoI, State Governments and implementing agencies at the city level, along with up to USD 200 million co-financing from the World Bank. The project is to be implemented in 10 cities, namely Ajmer, Ahmedabad, Hyderabad, Indore, Jalandhar, Mysore, Naya Raipur, Pune, Pimpri-Chinchwad and Thiruvananthapuram out of which projects in 6 cities (Ahmedabad, Hyderabad, Indore, Mysore, Pimpri-Chinchwad and Pune) are to be taken up as Phase I.

To integrate environmental and social considerations in project planning, design and implementation, an Environmental and Social Management Framework (ESMF) has been prepared, in line with the applicable requirements/procedures of the GoI and respective project states, and in conformity with the Environmental and Social Policies of the World Bank. The ESMF lays down the principles and guidelines for addressal of environment and social safeguard impacts, if any, due to the implementation of these Green Transport projects, proposed to be taken up as part of the SUTP.

A draft of the ESMF is currently being finalized by the cities and is available online at the MoUD website {MoUD web URL} and also available at the websites of the 6 Phase I cities. All interested stakeholders are requested to review the Draft ESMF and provide their views or comments if any, to **sumit_d6@yahoo.com** or to **iutindia.sutp@gmail.com** within a period of one month from the date of publication so as to address / incorporate them as feasible and finalize the ESMF for implementation.

GEF

GEF/WORLD BANK/UNDP – SUTP, India

Environment and Social Management Framework (Draft)

February 2009

MINISTRY OF URBAN DEVELOPMENT

Government of India

Project Preparatory Work Consultant: **LEA Associates South Asia Pvt. Ltd., New Delhi**

GLOBAL ENVIRONMENT FACILITY–
Sustainable Urban Transport Project, India

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Chapter 1. GEF Sustainable Urban Transport Project

1.1 INTRODUCTION

To encourage application of the National Urban Transport Policy and achieve a paradigm shift in India's urban transport systems in favour of sustainable development, the GOI has applied to the Global Environmental Facility (GEF) to implement GEF's Sustainable Urban Transport Project (SUTP) in India. The objectives of the SUTP are:

i. to strengthen capacity of GoI, and participating states and cities in planning, financing, operating and managing sustainable urban transport systems; and
ii. to assist states and cities in preparing and implementing demonstration "Green Transport" or "GEF-supportable Transport" projects (GT projects).

The project has two components:

- Component 1: National Urban Transport Capacity Development, and,
- Component 2: GEF Demonstration Projects[1].

The total GEF grant proposed for the project is US$ 25.575 million[2], which will be complemented with a grant of US$ 150 million from GOI, State Governments, and Implementing Agencies (IA) along with up to US$ 200 million co-financing from the World Bank. The project will be implemented over a four-year period, starting from 2009.

This Environmental and Social Management Framework (ESMF) lays down the principles and guidelines for addressal of environment and social safeguard impacts due to the implementation of the Green Transport projects in the selected[3] cities, to be taken up as part of the Component 2 of the SUTP.

1.2 GREEN TRANSPORT OR GEF- SUPPORTABLE TRANSPORT PROJECTS

The demonstration projects proposed by the agencies in these cities could be classified into the following five areas (i) public transport improvement; (ii) non-motorized transport and pedestrian facilities; (iii) integrated land-use and transport facilities; (iv) ITS (intelligent transport system) application to public transport systems; and (v) city centre traffic and environment improvement. **Table 1-1** presents the types of project in the SUTP. A detailed listing of projects and their sub-components as proposed in the selected cities is presented in **Annex - 1**.

---

1 This component will support identification, preparation, and implementation of a package of demonstration projects in the selected cities through a comprehensive and integrated planning, preparation, and appraisal process.

2 This grant includes US$ 575,000, US$ 225,000,000 and US$ 2,500,000 amount for project preparation, project cost and agency fee respectively.

3 The 10 selected cities are: Ajmer-Pushkar (Rajasthan), Ahmedabad (Gujarat), Hyderabad (Andhra Pradesh), Indore (Madhya Pradesh), Jalandhar (Punjab), Mysore (Karnataka), Naya Raipur (Chattisgarh), Pune, Pimpri-Chinchwad (Maharashtra), Trivandrum (Kerala)

Table 1-1: Type of Projects

Selected Cities	States	GEF Priorities				
		Public transport improvement	Non-Motorized Transport	Integrated land-use and transport system	ITS application	City center improvement
Ajmer-Pushkar	Rajasthan		X			
Ahmedabad	Gujarat				X	
Hyderabad	Andhra Pradesh		X			
Indore	Madhya Pradesh	X			X	
Jalandhar	Punjab		X			
Mysore	Karnataka	X			X	
Naya Raipur	Chattisgarh			X		
Pune	Maharashtra		X			
Pimpri - Chinchwad	Maharashtra	X				
Thiruvananthapuram	Kerala		X			

Ahmedabad, Hyderabad, Mysore, Indore, Pune and Pimpri-Chinchwad have been identified as Phase I cities. Sub-projects in these cities are as presented in the **Table 1-2**.

Table 1-2: Sub-projects in Phase I cities

City	Component	Subcomponent/Location
Ahmedabad	**Service improvements to planned BRT system**	Ahmedabad City
	Fare integration between existing AMTS service and new BRT	Ahmedabad City
	Automatic Fare Collection & control center for BRTS system	Ahmedabad City
	Automatic Traffic Control System (ATC)	Ahmedabad City
	Training for planning unit in BRTS organization	Ahmedabad City
	Bicycle Plan & Bicycle Rental Scheme	Ahmedabad City
	TA for transit oriented development	Ahmedabad City
Hyderabad	Pedestrian infrastructure improvement near MMTS	
	Footpath Improvements	Around MMTS Stations
	Pelican Signals	Around MMTS Stations
	Zebra Crossings & Signages	Around MMTS Stations
	FOBs	Around MMTS Stations
	Transit oriented development study	
	Multi-modal transfer site study	
Mysore	ITS for City Bus services	City Wide
	Retrofit for Bio fuel and storage depots	City Buses
	TA for sustainable transport plan	
Indore	Bus signal prioritization	Along BRTS Corridor
	Automatic Fare Collection	Along BRTS Corridor
Pune	Non-Motorised Transport	Development of Cycle tracks
		Improvement of pedestrian infrastructure
Pimpri -	Public Transportation Improvement	Setting up of BRT Corridors

City	Component	Subcomponent/Location
Chinchwad		Improvement of pedestrian infrastructure

Sub-projects proposed for GEF-SUTP

The sub-projects proposed in the various cities are:

- **Pedestrian / NMT Infrastructure Development**
  - Reconstruction of footpaths
  - Provision of Sub-ways / FoBs
  - Pedestrian Prioritization measures through traffic signals, pelican lights, road marking etc.
  - Construction of new footpaths
  - Paving and Delineation of areas as pedestrian friendly precincts
  - Peripheral Vehicular Parking
  - Construction of cycle lanes
  - Street Furniture, Lighting & Bollards
- **Feeder Services**
  - Procurement of low emission vehicles
  - Bus-stops, signage etc.,
- **Public Transport Infrastructure**
  - Dedicated Bus-lanes
  - Terminals/Depots/Commuter Amenity Centers
  - Procurement of Bus Fleet
  - Traffic Signal Prioritization
- **ITS Application to Public Transport**
  - Traffic Signal Improvements
  - Automatic Fare Collection
  - Public Information System-Plasma Screens, Display boards at bus stops etc
  - Control Rooms
- **Others**
  - Retrofitting of Bus Fleet
  - Minor Road improvements
  - Junction/Rotary Improvements
  - Rail Under Bridges

1.3 PURPOSE AND OBJECTIVES OF THE ESMF

The key objectives of the ESMF are to:

- Provide a framework for the integration of social and environmental aspects at all stages of the project planning, design, execution and operation of various sub-components
- Ensuring positive social and environmental impacts of sub-projects and avoid/minimize and manage any potential adverse impacts

In line with the requirements of the World Bank, the Bank's environmental and social safeguards policies shall be applied to all projects to be taken up under GEF-SUTP. The ESMF spells out the potential impacts in the project cities due to the planning, design, implementation and operation of the green transport projects and outlines the management measures required for an effective addressal of the same. Appropriate institutional arrangements towards implementing the measures proposed and the capacity building efforts required have been detailed in the framework. The adoption of this framework shall ensure that the projects meet the national and state level environmental and social requirements and are also consistent with the applicable safeguards policies and provisions of the World Bank.

1.4 APPLICATION OF THE ESMF

The ESMF is to be applied at all stages of project (as indicated in the flow chart, **Figure 1-1**) as in identification of sub-projects, screening and up to implementation and operation stage. The framework encourages participatory approach to preparation of sub-projects in respective cities.

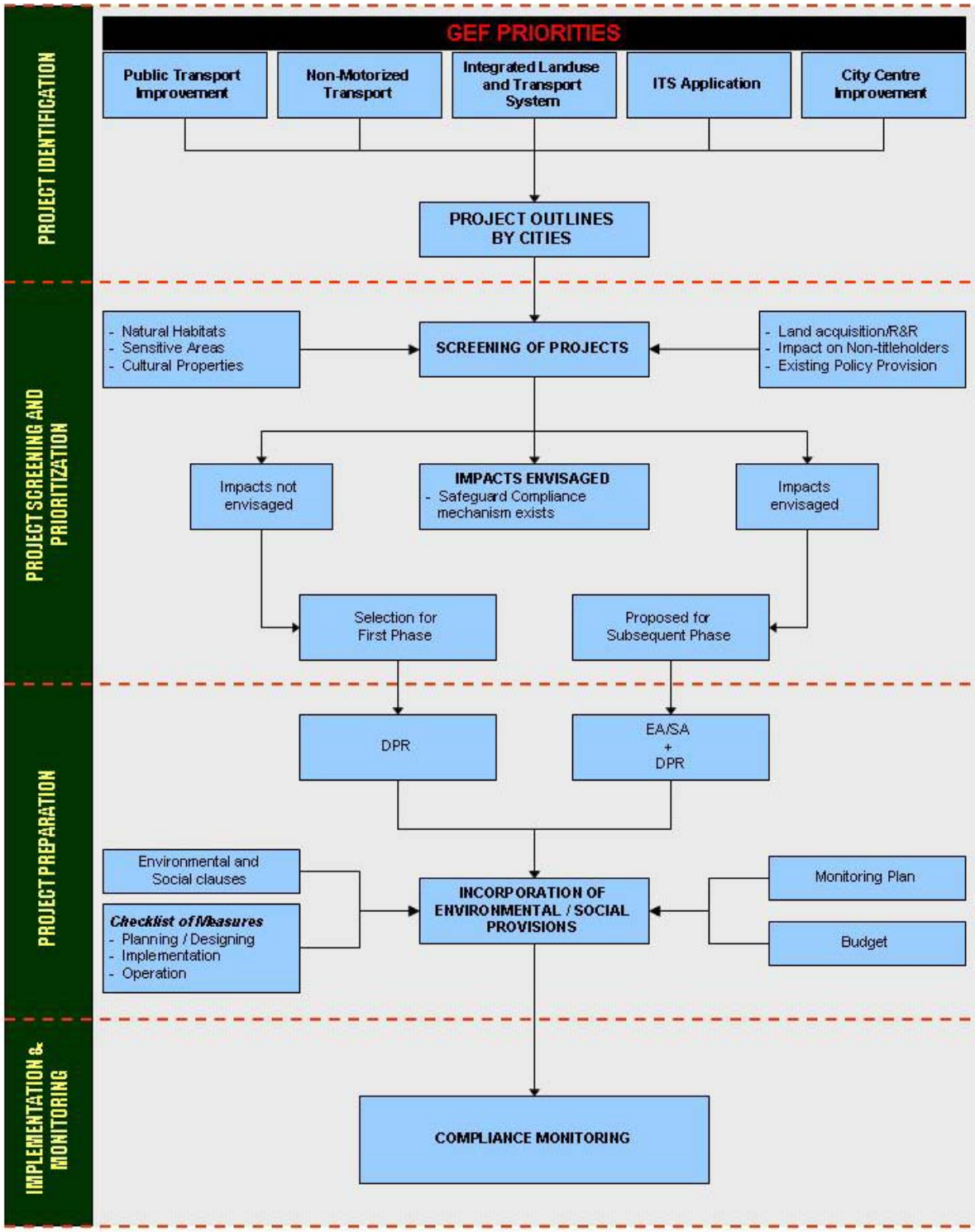


Figure 1-1: ESMF Implementation Process Map

The consultation & participation framework as part of the ESMF provides an overview of consultation and participation activities to be carried out in various stages of the project. Application of ESMF to the sub-projects enables preparation of a standardized environmental and social assessment documents for appraisal and implementation. **Annex – 2** presents a checklist of items that are required for conformance to the provisions of the ESMF.

Projects triggering significant environmental / social impacts, i.e. projects with potential to trigger impacts on environmentally sensitive areas, or large scale resettlement activities are not envisaged under GEF-SUTP. However, in the event of such projects, being critical to the GEF Priorities, the projects shall be included after undertaking the necessary environmental and social assessments, as mandated by the GoI / state governments and conforming to the safeguard policies of the World Bank.

The process for conformance to these procedures is defined in this framework, and shown in **Figure 1-1**. Preparation of project outlines for the projects to be included in the GEF-SUTP will enable identification of activities that are critical for triggering environment and social impacts. This shall be established through a screening exercise to be undertaken by examining each item as per the Checklist of items listed in **Annex – 2.** This shall enable identification of such projects where environmental social impacts that necessitate further detailed assessments are required and are suggested for inclusion in the second and subsequent phases of the project. This would enable not only fast-tracking of the projects to be taken up in the first phase, but also provide sufficient time for the cities to undertake necessary environmental and social assessments.

Chapter 2. Existing Policy, Legal and Administrative Frameworks

This section discusses the policies, legislations and procedures for environmental assessment and land acquisition / resettlement, at the national and state levels. Further, an outline of the environmental and social safeguards policies of the World Bank has been presented. As is evident from the section below, there are no substantial differences in principle between the two set of policies and operational procedures applicable. This framework addresses the gaps to ensure conformity to the WB safeguard policies while adhering to the national and state level policies.

2.1 NATIONAL LEVEL POLICY AND LEGAL FRAMEWORK

2.1.1. Environmental Assessment Requirements

As per section 3 of EIA Notification S.O. 1533 dated 14th September 2006, the Central Government forms a State Level Environment Impact Assessment Authority. All projects and activities are broadly categorized into two categories as Category A and B. The projects which have been classified as Category 'A' project are those having potential impacts on human health and natural and manmade resources. Those projects require prior environmental clearance from the central government in the Ministry of Environment and Forests (MoEF).

The projects categorized as Category 'B' projects require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA's decisions are based on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification[4]. Categories of projects mentioned in the notification are not included in the SUTP and hence, none of the project interventions as part of the SUTP trigger the environmental impact assessment / screening requirements as per the GoI regulations. However, for ready reference, the categories of sub-projects as per the notification are included in the **Annex – 3**. If any of these categories of sub-projects are included in SUTP, the stages of prior environmental clearance as per the MoEF EIA Notification of September 2006 and as indicated in **Annex – 3** should be adhered to.

Other applicable legislations of the Government of India include the following. These are briefly described in the **Annex-4**.

- The Environment (Protection) Act, 1986
- Water (Prevention and Control of Pollution) Act, 1974 as amended in 1978 and 1988
- Noise Pollution (Regulation and Control) Rules, 2000
- Forest (Conservation) Act, 1980 as amended in 1988
- Wild Life Protection Act, 1972
- CRZ Regulation of MoEF, 1991

[4] In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project is treated as a Category 'A' project.

2.1.2. Resettlement policy

At the central level, the National Resettlement and Rehabilitation Policy, 2007 and the Land Acquisition Act 1894 (as amended in 1984) are the applicable policies. Both the policies are described in detail below.

2.1.2.1. National Policy on Resettlement and Rehabilitation Policy (NRRP, 2007)

The policy is applicable to projects that are likely to physically displace 400 families or more en masse in plain areas and 200 families or more en masse in tribal or hilly areas, DDP blocks, or areas mentioned in Schedule V and Schedule VI of the Constitution of India. The objectives of the Policy are:

- To minimize displacement and to promote as far as possible, non-displacing or least displacing alternatives;
- To ensure adequate rehabilitation package and expeditious implementation of the rehabilitation process with the active participation of displaced persons;
- To ensure that special care is taken for protecting the rights of, and ensuring affirmative state action for weaker segments of society, especially members of SCs and STs and to create obligations on the state for their treatment with concern and sensitivity;
- To provide a better standard of living to displaced families;
- To integrate rehabilitation concerns into the development planning and implementation process; and
- Where displacement is on account of land acquisition, to facilitate harmonious relationship between the requiring body and displaced persons through mutual cooperation

Sub-projects conceived under SUTP though involve relocation of squatters and encroachers do not envisage large scale social and resettlement impacts. However, in the event of such impacts occurring in the project area, entitlement framework suggested as part of the ESMF will need to be adhered to.

2.1.3. Land Acquisition Act, 1894

The Act provides a framework for facilitating land acquisition within the Country. This Act enables the State to acquire private lands for public purposes. The Act ensures that no person is deprived of land except under the Act and entitles Affected Persons to a hearing before acquisition. The main elements of the Act are given in **Table 2-1**.

Table 2-1: Land Acquisition Act

Section	Aspect	Provision
Section 4	Notification of land	Notification of land identified for the purpose of public welfare. Objections must be made within 50 days to the DC (highest administrative officer of the concerned district. No further sales or transfers are allowed.
Section 6	Intention to acquire land	DC is directed to take steps for the acquisition, and the land is placed under Section 9. Interested parties are then invited to state their interest in the land and the price.
Section 11	Enquiry and award by Collector.	DC shall make an award within one year of the date of publication of the declarations. Otherwise, the acquisition proceedings shall lapse.
Section 12	Award of Collector when to be final.	Award shall be filed in the Collector's office and shall, except as hereinafter provided, be final and conclusive evidence, as between the Collector and the persons interested, whether they have respectively appeared before the Collector or not, of the true area and value of the land, and the appointment of the compensation among the persons interested.

Section	Aspect	Provision
Section 18	Reference to Court.	In case of disagreement on the price awarded, within 6 weeks of the award the parties (under Section 18) can request the DC to refer the matter to the Courts to make a final ruling on the amount of compensation. Compensation for land and improvements (such as houses, wells, trees, etc.) is paid in cash by the project authorities to the State government, which in turn compensates landowners. The price to be paid for the acquisition of agricultural land is based on sale prices recorded in the District Registrar's office averaged over the three years preceding notification under Section 4. The compensation is paid after the area is acquired, actual payment by the State taking about two or three years. An additional 30 percent is added to the award as well as an escalation of 12 percent per year from the date of notification to the final placement under Section 9. For delayed payments, after placement under Section 9, an additional 9 percent per annum is paid for the first year and 15 percent for subsequent years.

2.2 RESETTLEMENT POLICIES - STATES

All the cities considered are in states that have had previous experience in undertaking projects involving land acquisition thereby entailing Resettlement and Rehabilitation measures. Entitlement frameworks have been formulated (based on World Bank/ADB/State policies) and implemented or are in the process of implementation. **Table 2-2** gives the sectors in which the states have such experience.

Table 2-2: Entitlement Framework-State Sector of Experience

States	Sector of Experience
Rajasthan	Urban Infrastructure
Gujarat	Urban Development, Highway
Andhra Pradesh	Highways
Madhya Pradesh	Irrigation, Water resources
Punjab	Highways
Karnataka	Highways
Chattisgarh	Irrigation
Maharashtra	Urban Transport
Kerala	Fast Track Projects (Multi Sector), Urban Development

However, the entitlement frameworks prepared for these states need to be adapted to the current project initiatives. The present project demands specific attention to a) urban social issues as all projects are in cities, and b) encroachers and squatters as most of the impacted PAPs are likely to belong to this category. The entitlement frameworks prepared for each of the states address most of the social impacts. These include:

- Loss of land and property;
- Loss of livelihood;
- Impacts on vulnerable groups;
- Impacts on non-titleholders; and
- Impacts on community properties.

An entitlement framework has therefore, been prepared for the project and is described in the following sections.

2.3 THE WORLD BANK'S SAFEGUARD POLICIES

The World Bank's Operational Policies (OP) includes guidance on Environmental Assessment requirements. The Bank's Safeguard Policies, ten of them, is meant to ensure that operations of the Bank do not lead to adverse impacts or cause any harm. The Safeguard Policies are lumped into Environment, Rural Development, Social Development and International Law. The following four out of the ten are relevant for considerations under the ESMF. These are as indicated below and elaborated in **Annex – 5**.

- Environmental Assessment (OP 4.01);
- Involuntary Resettlement (OP/BP 4.12);
- Management of Cultural Property (OPN 11.03)

2.4 IMPLICATIONS FOR GEF – SUTP

All the sub-projects in the GEF-SUTP would not require prior environmental clearance from the State / Central Environmental Appraisal Committee as the infrastructure projects discussed in the project do not fall under any of the requirements suggested as per the Schedule for the MoEF Notification on Environmental Impact Assessment dated 14th September 2006.

Also none of the provisions of CRZ also are applicable as the sub-projects suggested as part of the GEF-SUTP are located away from the CRZ and have no implications on it even in Thiruvananthapuram, which is the only coastal city of those proposed for GEF. However provisions of Air and Water Act would be applicable for activities involving civil works.

However, the World Bank policies of Environmental Assessment, Cultural Properties and Involuntary Resettlement will be applicable in sub-projects involving civil construction activities and removal of squatters / encroachers.

Amongst the sub-projects in Phase I cities, BRT Component in Pimpri-Chinchwad will require an Environmental Assessment and Management Plan in line with the provisions of this framework. For other sub-projects the addressal of environmental impacts shall be through conformance to the checklist of environmental provision in the DPR Preparation. Integration of environmental management measures in the DPR preparation (**Annex-2**) shall be through inclusion of contract clauses in the tender documents during pre-construction / construction or post construction stage for identified management measures. In case of operation stage, the Operations Manual including ESMF is to be followed as a guideline and activities relevant to the project component are to be formulated and implemented by the Implementing Agency.

Similarly, the sub-projects in Phase I cities, BRT component in and Pimpri-Chinchwad will require a Social Assessment and Resettlement Action Plan as it involves land acquisition. Rest of the sub-projects where land acquisition and resettlement is not envisaged, completion of the Resettlement Checklist in DPR preparation (**Annex-2**) to confirm that no further SA is required, is to be undertaken.

Chapter 3. Project Description

Project interventions in the GEF-SUTP are envisaged in 10 cities of the country. A brief description of the project interventions in the project cities is presented in the following sections.

3.1 AHMEDABAD

The Ahmedabad Municipal Corporation (AMC) intends to improve the accessibility and mobility in the city and the quality of life through a combination of transport planning and management measures duly supported by improvements in public transportation and policy measures. The sub-components are being planned as part of project proposal for GEF-SUTP as the:

- Supply and Installation of ITS for GPS Control of AMTS Buses
- Training for planning unit in BRTS organization, AMTS and Associated Agencies
- Bicycle Plan & Bicycle Rental Scheme
- TA for Transit Oriented Scheme
- Transit Integration Study

In the BRT sub-component, soft measures as ITS for AMTS buses, providing control centre for BRT, apart from training for planning unit in BRT are planned. The Bicycle plan and rental scheme would mostly be Technical Assistance support in the form of studies for alternative modes of transport.

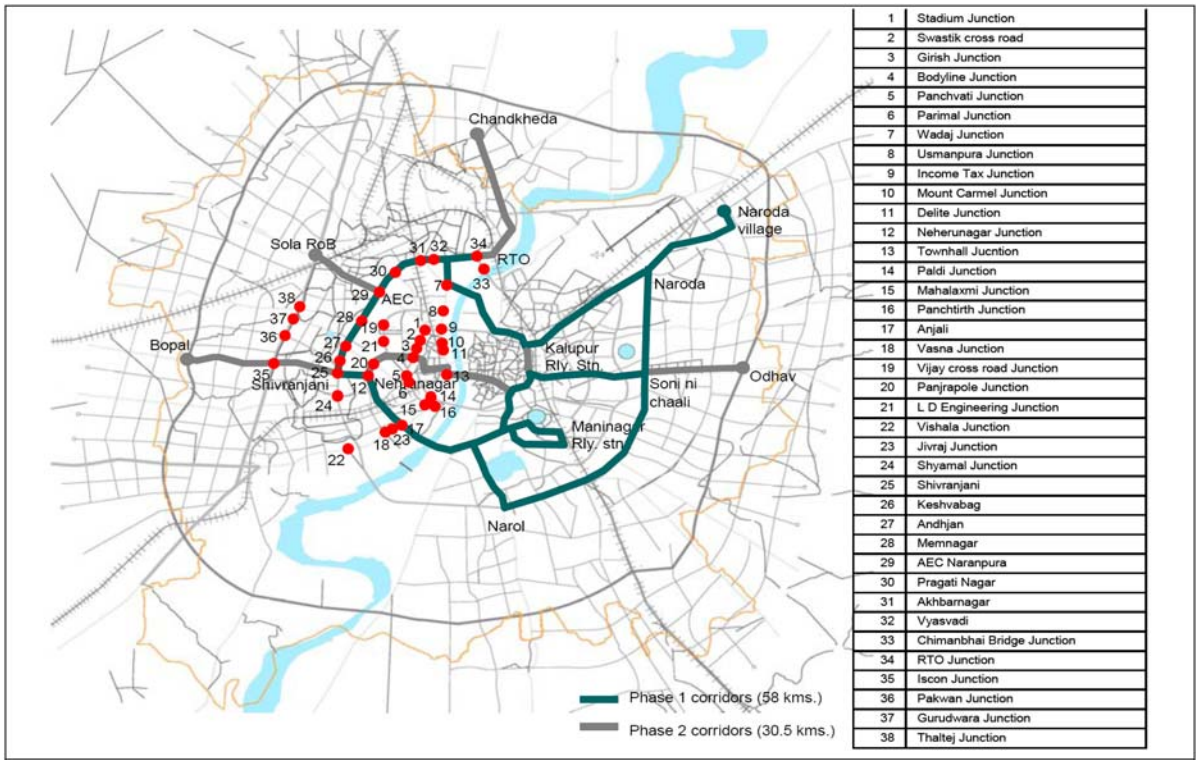


Figure 3-1: BRT corridors and Proposed Area Traffic Control system along with junction improvements at 38 Locations

Project outlay for the sub-components is estimated at INR 19.95 Crores and all the components will be initiated in Phase I of the GEF-SUTP. These project interventions are envisaged to

increase the usage of public transport and reduce personal vehicle usage thereby reducing environmental pollution.

The project will be developed and implemented by the AMC with technical support from the CEPT University, Ahmedabad and AMTS. Overall executive control of the project implementation will be with the AMC – JnNURM.

3.2 AJMER

Project priorities in Ajmer – Pushkar have been mainly reduction of vehicle – pedestrian conflict thereby improving safety of pedestrians and reducing environmental pollution by provision of adequate parking facilities outside core areas. Keeping these priorities in view, the proposed project components (**Figure 3-2**) in the city include:

(i) Improving Pedestrian Infrastructure in Ajmer City Area
- Construction of Sub-way at Gandhi Bhawan Circle for safe pedestrian movement
- Provision of Railway Over Bridge at John's Gunj
- Introduction of pedestrian priority traffic signal at important junctions along with improving geometric designs of the junctions by providing exclusive pedestrian phase to facilitate safe crossing for the pedestrians
- The provision of Pelican Lights at schools, colleges & important institutions area
- Road marking and associated street furniture like street lighting, railing, zebra Crossing and stop line marking etc.
- Provision of Parking Facilities

(ii) Environmental Enhancement of Pushkar area through provision of Pedestrian infrastructure
- Paving of main spine-Parikrama Marg (with cobbled stone/interlocking tiles) for giving it a distinct image

Sub components of these projects involve civil construction works aimed at the above objectives. Major construction works in these components include construction of subway in Ajmer city for safe movement of pedestrians, construction of railway over bridge, provision of parking facilities in the city area and paving main spine i.e., the Parikrama marg (with cobbled / interlocking tiles) for giving it a distinct image. Other interventions in the project are mostly prioritisation of signals for safe crossing of pedestrians, improvement of traffic sign markings and provision of pelican lights.

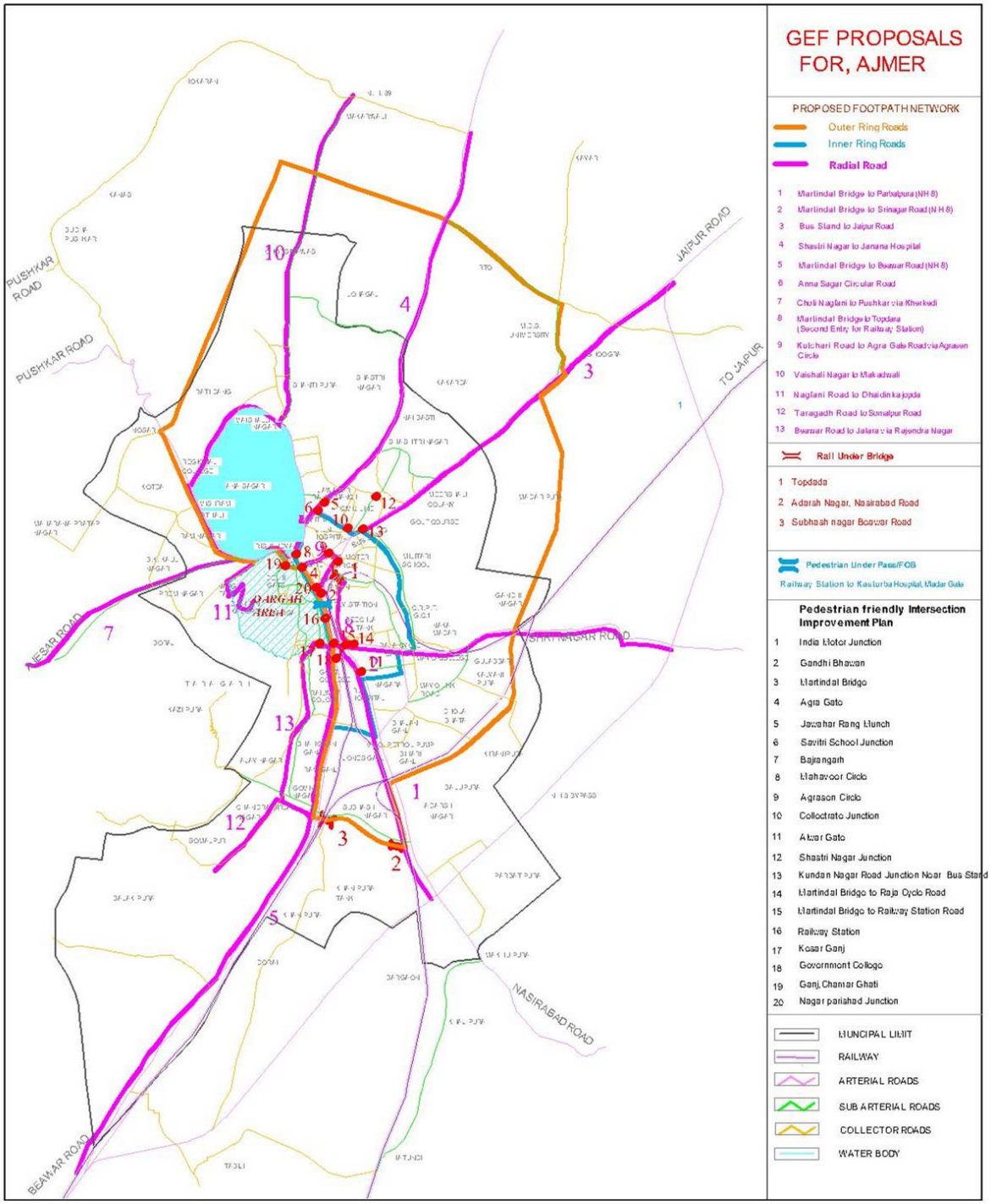


Figure 3-2: Map of Project Interventions in Ajmer

Project outlay for the sub-components is estimated at INR 33.4 Crores. A city level dedicated Project Implementation Unit with Executive Engineer, Ajmer Municipal Corporation as the Project Manager has been formed for implementing JnNURM. This agency will be strengthened with transport professional and procurement specialist towards implementing the GEF – SUTP project interventions.

3.3 HYDERABAD

Project interventions in Hyderabad city are aimed at promoting public transport consistent with the transport master plan prepared for the city. The proposed project component as part of the GEF-SUTP is improvement in the pedestrian facilities for enabling better accessibility to the Multi Modal Transport System (MMTS).

As part of this component, pedestrian access in the precincts of MMTS stations are intended to be improved as part of the GEF-SUTP. This involves rendering the pedestrian facilities free from encroachments, design and construct facilities with sufficient detail to function efficiently for transfer of passengers to MMTS. The Components proposed under the project are:

(i) Provisions of proper Pedestrian safety measures include provision of encroachment free continuous footpaths, Zebra Crossings, installing Pedestrian Signals and construction of Foot Over-Bridges (FOB)

(ii) Provision of proper and wide access roads

(iii) Provision of ample parking areas near the stations to encourage park and ride concept for people with bicycles & two wheelers to encourage the system.

The proposed Pedestrian friendly improvements have been proposed at 15 identified MMTS stations (as shown in **Figure 3-3**), wherein improvements have been suggested within area of 2.5 km radius of the proposed locations.

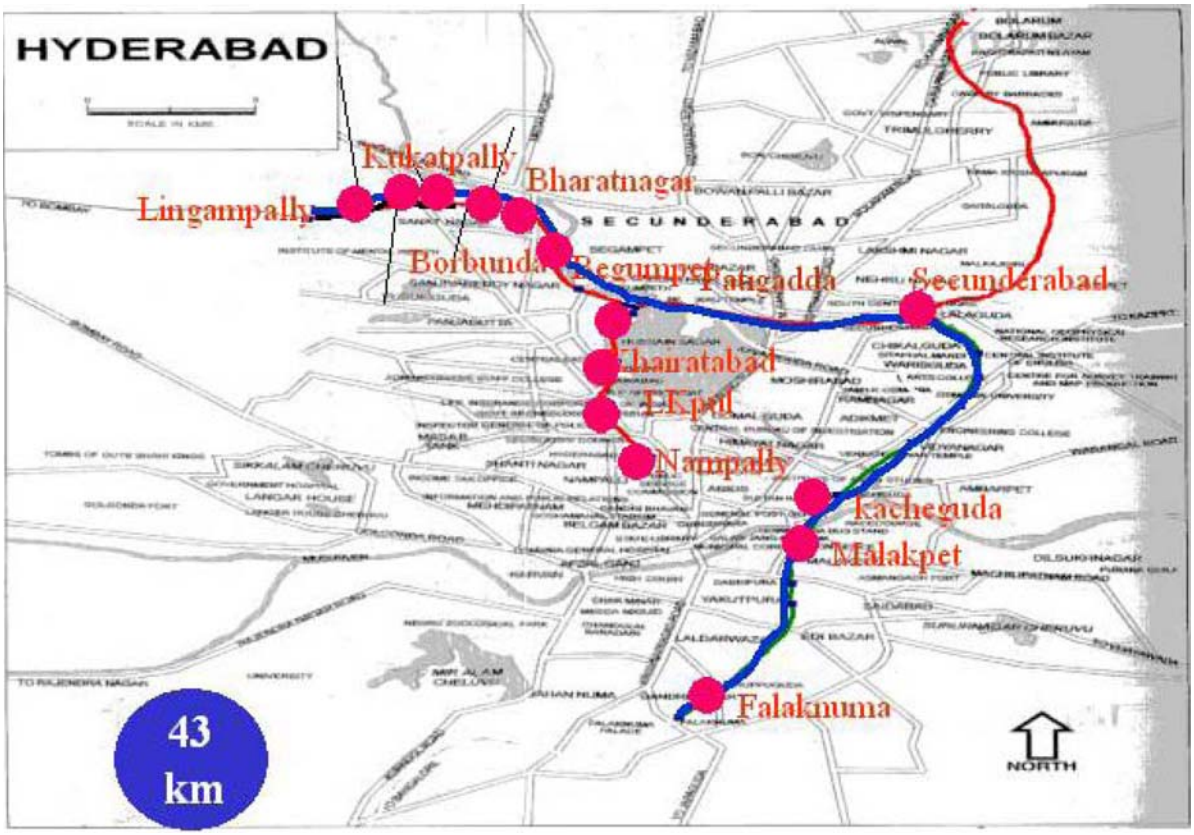


Figure 3-3: MMTS Stations proposed for improvements in Phase I and Phase II of GEF-SUTP

Project outlay for the proposed components is estimated at INR 59.3 Crores. The project is proposed to be taken up by forming a Project Implementation Unit in the Greater Hyderabad Municipal Corporation (GHMC) which will be monitored by a committee comprising of members from other stakeholders as the Hyderabad Urban Development Authority (HUDA) for the MMTS pedestrian improvement component.

3.4 INDORE

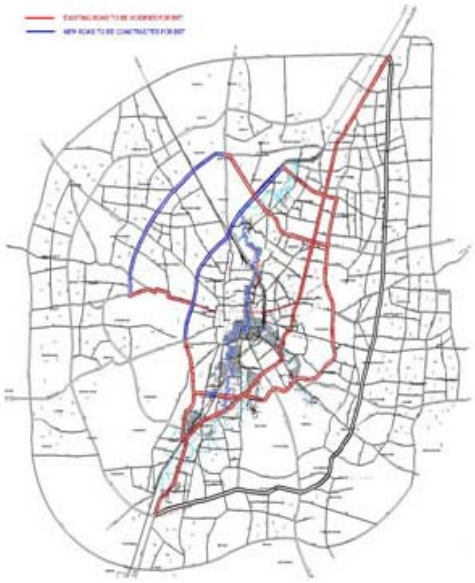
Project interventions in the city are aimed at increasing the use of public transport through measures such as implementation of traffic streamlining and improvement of parking and pedestrian facilities consistent with the proposals of the Traffic & Transportation Master Plan. The proposed project components for GEF-SUTP are (i) Traffic Signal Prioritisation along BRT Corridors and (ii) Automatic Fare Collection systems.

The subcomponents of both the project components are as detailed below:

(i) Traffic Signal Prioritization along BRT Corridors
- Traffic signal co-ordination along the corridors with adaptive signal control systems which coordinate control of traffic signals across a signal network, adjusting the lengths of signal phases based on prevailing traffic conditions.
- Centralised Traffic Control Center where all the upgraded traffic signals in the city will be controlled.
- Traffic Surveillance and Detection System with Sensors/Cameras to Monitor Traffic Flow
- Interface with GPRS and Passenger Information System

(ii) Automatic Fare Collection Technology for Integrated Public Transport
- Off-Board Fare Collection Mechanism for BRTS and Both On & Off Board Fare Collection for ICTSL Standard Buses
- Fare Integration and extension of Services to proposed radio taxi, Auto, IPT's, parking tolls, Congestion Taxing etc.
- Central Computer System
- Depot Computer System
- Ticket Office Terminal – to Issue Contact less Smart Card, add value and enquiry centers
- Call Centre for Card Holders
- Interface with GPRS and Passenger Information System

The proposed BRT corridors for implementation of GEF-SUTP interventions are along 7 BRT corridors totalling a length of about 120 km. Total project outlay is estimated at INR 49.75 Crores. The proposed project will be implemented by ICTSL, during the Phase I of GEF-SUTP. ICTSL would be responsible for coordination of DPR preparation, conducting evaluation and quality control. The A B Road pilot project (Mangliya to Rau) is being implemented in the first year. The Length of the Corridor is 27.50 Kms with 55 Bus Stops and 5 BRTS Interchange Stations identified along the corridor. **Figure 3-4** presents the location of A B Road pilot corridor with respect to other BRT corridors proposed in the city.



Corridor	Distance
•AB. Road Corridor	23.80 Kms
•Eastern Ring Road Corridor	23.65 Kms
•M.R.10 Corridor	8.71 Kms
•River Side Road Corridor	14.50 Kms
•Western Ring Road	15.90 Kms
•Badaganpti To airport	5.30 Kms
•RW2 Ujjain Road to airport	9.50 Kms
•Other road(M.G., RNT , YN.)	19.10 Kms
Total	**120.46KMs**

Figure 3-4: Proposed BRT corridors in Indore

3.5 JALANDHAR

Cycle and cycle rickshaw hourly person trips in the city are higher than Bus and Mini Bus trips. This highlights the significance of non-motorized component in the city. When compared in terms of the daily person trips, NMT (Cycle and cycle Rickshaw) outperforms even the Mini Bus (the Present Public Transport Facility), 41,000 against the 16,000 daily person trips, thus showing the large possibility of improving and patronizing pedestrian and cycling facility in the city.

Therefore, promotion of NMT (Cyclists & Pedestrians) environment will provide an opportunity for city to reduce its reliance on non-renewable sources of energy thus addressing the issue of energy efficiency/climate change. It also addresses the issue of safety of a very vulnerable portion of the city traffic, besides providing an equal environment for poorer section to exercise its right on city roads. Thus, the projects proposed in GEF-SUTP are aimed at improving pedestrian and cycling facilities along main corridors in the city (**Figure 3-5**).

The proposed sub-components under the project are as follows:

- Construction of footpath of varying width, depending on availability of the right of way along various roads in the city
- Development of supporting pedestrians' facilities such as pedestrian signal lights, road marking & signages, street furniture and associated landscape enhancement at important locations
- Construction of cycle track of varying width, depending on availability of the right of way along various roads in the city
- Development of ancillary facilities like road signage/marking and landscape improvement for the proposed cycle network
- Construction of rickshaw tracks along various roads
- Development of ancillary facilities like signage, marking, shelters, public conveniences etc. for rickshaw tracks.

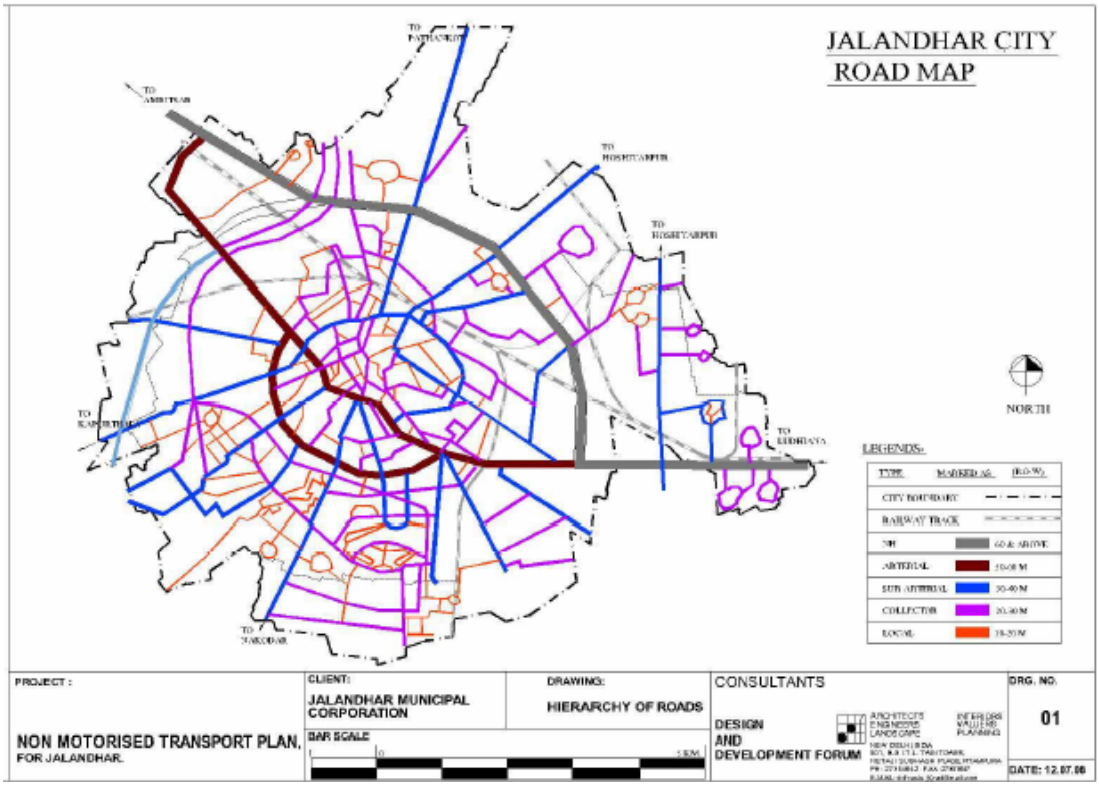


Figure 3-5: Road Map of Jalandhar Proposed for NMT

Total project outlay for the City is estimated to be INR 224 Crores. Preparation of a DPR for provision of footpaths and cycle tracks will be included in the Phase I of GEF-SUTP while its construction and implementation will be undertaken in Phase II. Jalandhar Municipal Corporation is the implementing agency for the project with a dedicated Project Implementation Unit being envisaged to be setup under the Municipal and Joint Commissioner.

3.6 MYSORE

Project interventions in the city under GEF-SUTP are aimed at addressing the issues of slow movement of public transport due to heterogeneous traffic conditions and increase of private vehicle ownership. Proposed project components include (i) introduction of Intelligent Transport Systems and (ii) Retrofitting of bus fleet with bio-ethanol facility and provision of diesel particulate filters for 750 buses. Sub-components specifically being undertaken as part of GEF-SUTP are as below:

(i) Sub-Components of the ITS project:

- Establishment of a centralized traffic control center to handle the operational requirements of traffic management
- Introduction of GPS services in city bus fleet to monitor the bus movement
- Introduction of display boards (LED) at all the bus-stops of the city (50 No.) for providing real-time information about bus operations
- Introduction of public information system (announcement system) inside the buses
- Provision of plasma display screens for checking the arrival and departure of buses at two main bus stations

- Introduction of daily, weekly and monthly passes for commuters and e-purse facilities through smart cards to reduce the ticket transaction time inside the buses
- Introduction of information services to traveling passengers through SMS, PDA devices

(ii) Sub-Components of the Retrofitting Proposal:

- Bio-Ethanol Facility at four depots
- Provision of Diesel Particulate Filters for 750 buses

The proposed project is to be implemented in the Phase I of the project with a total outlay of INR 23.7 Crores. The project will be implemented by Karnataka State Road Transport Corporation (KSRTC) which will have a management steering committee headed by the Vice Chairman and Management Director.

3.7 NAYA RAIPUR

Proposed project components in the city are aimed at providing access to high speed intercity travel between the Raipur and Naya Raipur. Naya Raipur being a new city designed to decongest the existing city, which is congested due to unplanned road network infested with heterogeneous traffic conditions. Given the objective of decongestion, the planned road network to the city is expected to induce the heterogeneity on the network. The project intervention is thus aimed at introducing exclusive bus lanes on all major arterial roads (**Figure 3-6**).

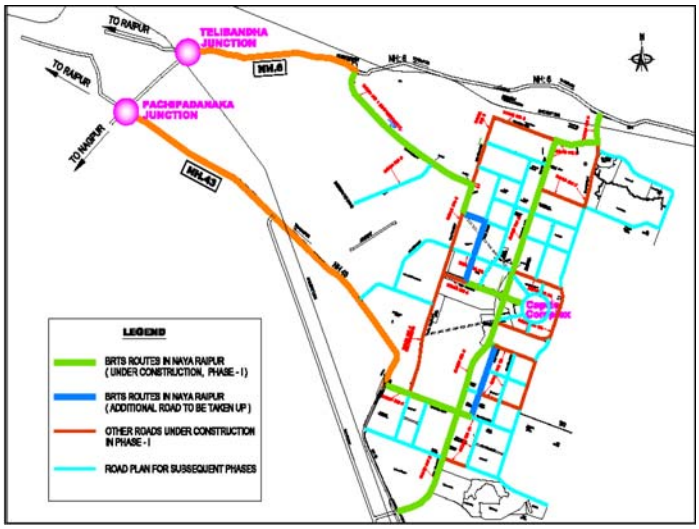


Figure 3-6: Planned BRT Network in Naya Raipur

For projects to be funded under GEF-SUTP it is proposed to initiate BRT System for about 28 km in length covering the central spine of the city (i.e., about 15 km) and on expressway linking the city with NH-6 for about 6 km. Proposed sub-components in the project include bus lanes, bus terminals / shelters, procurement of bus fleet and also a technical assistance study on Transit Oriented Development.

Project outlay for the city is estimated at INR 163.34 Crores and is to be implemented in the Phase II of the project. Institutional arrangements for the project implementation are not yet finalised.

3.8 PUNE

Proposed project interventions in the city are aimed improvement to the existing transportation system that is efficient, safe and accessible mass transportation system for the entire region. The projects proposed in GEF-SUTP are aimed at improving pedestrian and cycling facilities along two pilot corridors in the city where local public transport are already plying. While the cycle infrastructure improvements would act as feeder services to the existing BRT, improvement of pedestrian facilities would improve safety of commuting pedestrians. These would ensure greater safety and efficient integration of pedestrians and cyclists in the city as well as enhance overall

environment and give opportunity for improving personal health. The proposed sub-components under the project are as below:

(i) Pedestrian Infrastructure Improvements:
- Reconditioning footpaths by adding to their widths where necessary; and limiting their height where it exceeds the standards.
- Improvements of sections of existing footpath depressed for facilitating driveway access, construction of raised crosswalks and where pedestrian facilities are absent, constructing them de-novo on the length of roads to be meted out with the treatment. FoBs/Sub-way for pedestrian/cycle access
- Street Furniture, Lighting and road marking

(ii) Cycle Infrastructure Improvements
- Construction of Cycle Tracks at city level and as feeder network for BRT
- Cycle stands on either side of BRT stations.
- Traffic Signal priority for cycle users and pedestrians
- Street Furniture, Lighting and road marking etc.

The feeder roads identified along the Pilot BRT route shown in **Figure 3-7** provides their location in the city.

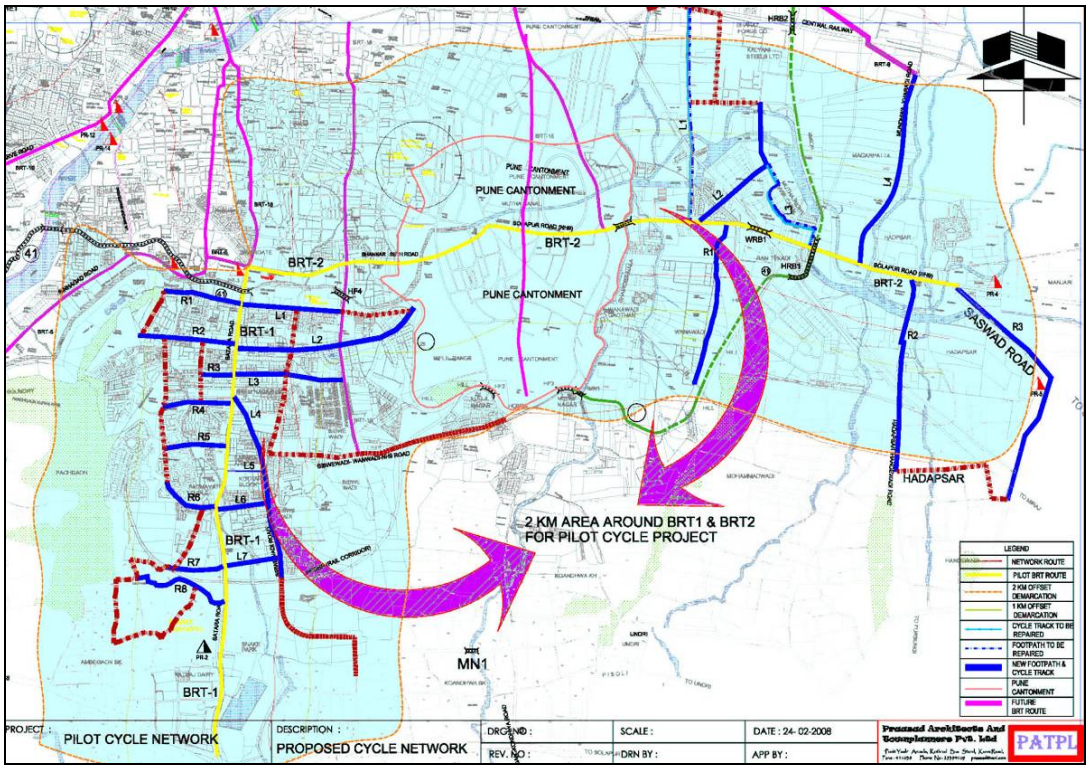


Figure 3-7: BRT corridors and proposed NMT improvements

Total project outlay for the City is estimated to be INR 120.58 Crores. Upgradation of footpaths and preparation of a DPR for provision of cycle tracks will be included in the Phase I of GEF-SUTP while its construction and implementation will be undertaken in Phase II. Pune Municipal Corporation is the implementing agency for the project with a dedicated Project Implementation Unit been setup.

3.9 PIMPRI – CHINCHWAD

Through this study, PCMC is proposing to improve its existing road network and also provide a public transportation system in the form of a BRT system along its major roads. The proposed BRT system consists of a network of corridors across PCMC area. The corridors have been selected based on criteria such as travel demand, hierarchy of road, existing bus-routes. The corridor details are indicated in Figure.

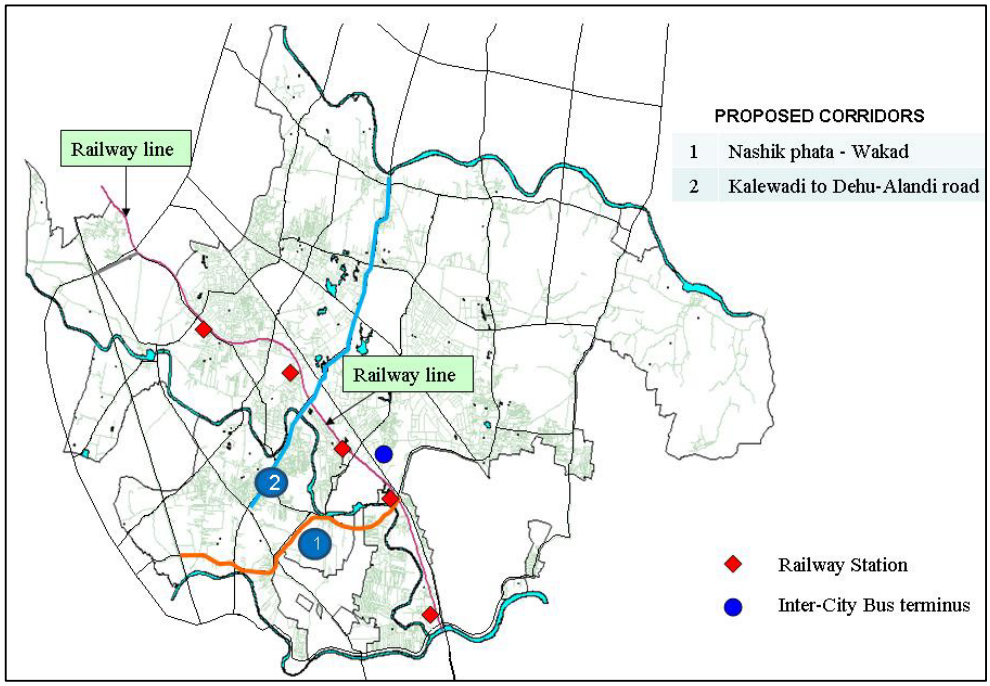


Figure 3-8: Proposed BRTS Corridor for Improvement

The following components form part of the Right-of-Way configuration:

- Dedicated bus-lanes have been located in the middle of the carriageway, on either sides of the median,
- Bus-stops are located at a distance of about 250 m on either side of junctions and at mid-block locations at distances of 500-700 m beyond junctions,
- Provision of separate lanes for pedestrians and non-motorised vehicles on either ends of RoW

Two corridors, Kalewadi Phata to Dehu Alandi (13.2 km) and Nashik phata to Wakad (7.8 km) are being submitted for funding under this project with a total cost of Rs. 674.59 crores. The projects are aimed at inclusion in the Phase I of the GEF-SUTP. Pimpri Chinchwad Municipal Corporation is the implementing agency for the project.

3.10 TRIVANDRUM

Proposed project interventions in the city are aimed at decongestion of the existing congested areas near railway station and Chalai area to bring about reductions in GHG emissions and improve environmental quality in the area. The proposed project components in GEF-SUTP include (i) pedestrianisation of Chalai Main Street and ancillary alleys and (ii) Construction of elevated walkway connecting Chalai market, Central Railway Station and Central Bus Stand. Proposed sub-components in the project are as below.

(i) Pedestrianization of Chalai Main Street and Ancillary Alleys (under DSC-1:KSUDP Contract, **Figure 3-9**)

- Conversion of Chalai Main Street and selected alleys into a vehicle free zone. Regulated parking outside this vehicle free zone.
- Redevelopment of road network and traffic movement pattern of the area surrounding the Chalai Main Street and selected alleys.
- Rejuvenation of the old market area by implementation of pedestrian zone status
- Development of organized parking spaces/structures
- Development of dedicated/special truck parking facility at Kuriathy/Sreevaraham

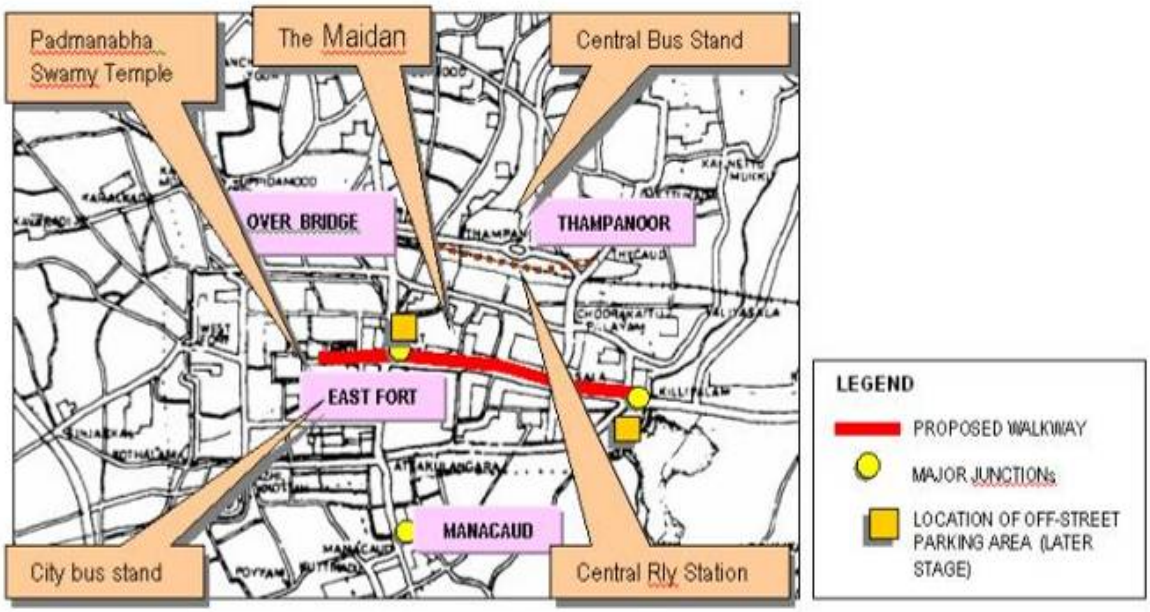


Figure 3-9: Location of project area – Chalai Market Street

(ii) Walkway (elevated) connecting Chalai Market, Central Railway Station and Central Bus Stand (under DSC-1:KSUDP Contract, **Figure 3-10**)

- Reduction of congestion in Thampanoor area, gateway point of city (rail and bus modes)
- Integrated redevelopment of Central Bus Stand, Central Railway Station with the proposed elevated walkway connecting Chalai
- Redevelopment of the Thampanoor circle and roadway system
- Redevelopment of Railway Station Parking zones
- Redevelopment plan of Chalai area, at the crossing of Power House Road with the proposed elevated walkway

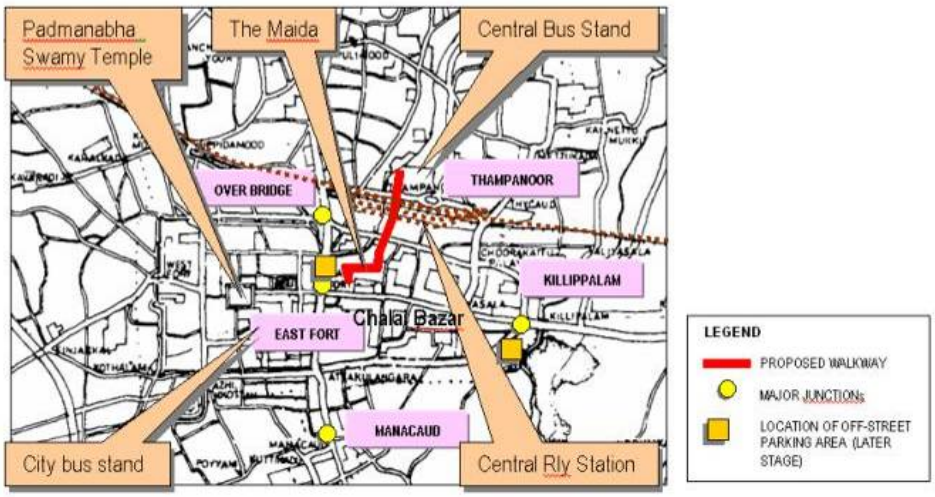


Figure 3-10: Location of proposed pedestrian walkway

Total project outlay for the project interventions is estimated at INR 42.49 Crores and would be implemented in Phase II of the GEF-SUTP. The Kerala Sustainable Urban Development Project (KSUDP) is the nodal agency in the state acting as a Project Implementation Unit for the project. This will work in close coordination with the Thiruvananthapuram Municipal Corporation (TMC) assisted in technical matters by the Technical Support Unit (TSU).

Chapter 4. Situation Assessment–Project Cities

This section provides an overview of environment and social characteristics of the ten project cities. The information has been compiled from secondary sources of information, including the City Development Plans and other published data sources. The situation assessment has formed basis for identification of critical environmental and social issues, if any, due to the project.

4.1 AJMER

4.1.1. Physical Environment

Ajmer is surrounded by three hills of Aravalli Ranges i.e. Nag hills, Madar hills and Taragarh hills at an average of 486 m above MSL. Anasagar lake forms the natural boundary in the North-West direction. The natural topography has resulted in creation of a number of water bodies which form an integral part of the city today.

The city has moderate climate, with daily temperatures ranging from 26.9^{0}C to 39.4^{0}C during May, and 7.6^{0}C to 22.5^{0}C during January, the coldest month. The average rainfall is about 50cm and average humidity is 57%. The rainfall in the region is very erratic. The city recorded maximum rainfall of 1200.4 mm in 1975 leading to severe floods.

The city has excellent connectivity, both road and rail, within the State and beyond. The city's locational significance, as a sub-regional centre for trade and commerce, can be understood by the fact that it serves as an intersection point for three National Highways (NH 8, NH 79 and NH 89). NH 8 connecting Delhi - Mumbai bifurcates the city, northeast to southwest. NH 79 and NH 89 originate from Ajmer, and connect to Bhilwara and Bikaner respectively. The city is served by a By-pass Road along NH 8, to facilitate movement of heavy traffic. Other major roads include state highway roads, connecting to Ararka and Pushkar.

4.1.2. Socio-Economic Environment

4.1.2.1. Demography and Economy

The population of Ajmer, as per 2001 Census is 4.85 lakhs. Apart from the resident population, the city has a high floating population (avg. 1.25 lakh/month, i.e. 4,000 tourists / day). Ajmer is a low density city with a very high density inner core, with population density of over 50,000 persons / sq.km. The gross average density of the city is 5750 persons / sq.km. The city has a fairly high literacy rate of 83.7% against the State average of 63.6%. The working population of Ajmer comprises 28% of the total population of the city, of which 90% population constitutes main workers whereas the rest 10% fall under marginal workers category. Central government is the largest employer – around 10,000 people are employed in Railway workshop. Railway workshop and HMT factory are the only major industrial centres in the city. With the presence of world famous Dargah of Sufi Saint in the city and close proximity to Pushkar (the religious town) tourism is also a major contributor to the city's economy.

4.1.2.2. Land use

Prominent occurrence of mixed land uses in the inner city is a key feature. The pattern of growth is a ring and radial pattern with a central nucleus. While the residential developments over the

last few decades have been spreading outwards, the commercial activities are still concentrated in and around the inner city.

4.1.2.3. Access to basic infrastructure

Presently Ajmer is mostly dependent upon Bisalpur dam for its water supply which is 115 Km away from the city. Municipal water supply covers 90% of the population. The total wastewater generation from the city is 54.40 MLD. The system coverage is very low. The city does not have a Sewage Treatment Plant; as a result, the collected raw sewage is discharged into Khanpura tank, which is further, reused for irrigation purpose. Wastewater from kitchens and bathrooms is discharged into open drains, which ultimately flow into Anasagar lake. Regarding solid waste management, a study conducted under RUIDP estimated that at present Ajmer produces approximately 150 TPD of solid waste. Unorganised primary collection of household waste results in littering of the streets and choking of drains.

4.1.2.4. Road and Transportation

NH-8 passes through the city connecting Jaipur in the North to Ahmedabad in the South. NH-89 connects Ajmer with Pushkar in the west and Kota in the east. Absence of public transport system in the city has led to operation of Intermediate Public Transport (private vehicles) like Mini Buses, tempos and auto rickshaws, which operate, from different parts in the city. Heterogeneity of traffic, on-street parking, encroachment by informal sector, uncontrolled stoppage of intermediate public transport vehicles for long duration on the carriageway, insufficient facilities for pedestrians have aggravated the traffic problems in the city.

4.1.2.5. Urban poverty

Ajmer has 73 slums, the population of which constitutes one-fourth of the city population. Railways provide employment to large section of urban poor and slum development has been along the railway factory. Infrastructure facilities are very poor within the slums. The drinking water supply in the slums is not adequate. In summer months, the supply is for 45-60 minutes, once in 3 days, whereas, in remaining months, the supply is every 2 days for the same duration. Across the slums, the drains are open and not covered. As a result, they are often choked as the garbage is dumped in them. Since most of the slums are on the hill tracts, the open disposal of garbage in drains blocks the drainage system, resulting in flooding, especially during monsoons. Few households have constructed toilets, however, open defecation is common and uses of public toilets are also limited.

4.1.2.6. Heritage

Ajmer has been a great centre of pilgrimage, for both Hindus and Muslims, a feature that gives the city its character. The great Sufi saint Khwaja Moin-ud-din-Chisti of Persia, is buried here, and his Dargah is equally sacred for the followers of Islam, as well as Hinduism. Adhai-Din-Ka Jhonpara, Akbar’s Fort, Ana Sagar Lake Taragarh Fort, Shah Jahan's Mosque are the other important places of heritage importance. The Dargah attracts large number of tourists all round the year, but the tourist flow peaks during Urs. On an average 4000 tourists visited Ajmer daily (2005). May-July are the lean months. The number of pilgrims attending Urs has shown a sharp increase from 1.5 lakhs in 2004 to 4 lakhs in 2005.

4.2 AHMEDABAD

Ahmedabad is one of the most important centers of trade and commerce in western India. The city has a great architectural tradition reflected in many exquisite monuments, temples and modern buildings. The Greater Ahmedabad Urban agglomeration covers an area of about 4200 sq. km.

4.2.1. Physical Environment

4.2.1.1. Physiography & Climate

Ahmedabad City lies between 22°55' and 23°08' North Latitude and 72°30' and 72°42' East Longitude. The city is devoid of any major physical features except for the River Sabarmati, which cuts the city into two parts: eastern walled city and western Ahmedabad on either side of its banks.

Ahmedabad has a tropical monsoon climate which is hot and dry, except in the rainy season. Summer days are very hot with mean maximum temperature of 41.3^{0}C while, nights are pleasant with mean minimum temperature of 26.3^{0}C. The mean maximum and minimum temperature in winter are 30^{0}C and 15.4^{0}C respectively. The average annual rainfall of the area is 782mm. It occurs generally during the months of June to September. The average relative humidity is 60% which ranges from 80% to 90% during rainy season.

4.2.2. Socio-Economic Environment

4.2.2.1. Demography

The population in the AMC limits increased to 45 lakh in 2001 from 33 lakh in 1991. Spatial distribution of this population within the city over the decades shows that up to 1981 most of the new population added to the city was concentrated within the old AMC limits itself, especially in the eastern part. Earlier only the eastern parts, especially the eastern periphery registered faster growth rate, but since the 1980s even the western periphery has grown rapidly. Growth rates have declined from 3.2 to 2.2 percent compounded per annum during the past two decades. The population within the old AMC limits has approached stabilization level.

4.2.2.2. Economy

The city contributes to 17 percent of the State's income in 1995 and is expected to be around 20% in the current context. Traditionally, Ahmedabad has been an important centre of manufacturing. Almost 40% of the dyestuff factories in India are located in Ahmedabad. Pharma companies have flourished in Ahmedabad and the growth trend is expected to continue given the positive outlook of pharma industry in India.

Large investments in private ports are likely and as a consequence the state is geared to become the trade gateway for the entire north and central India. The extensive port network is also expected to facilitate the growth of new, high-end manufacturing industries. Several key high-growth industries such as textiles, pharmaceuticals and natural gas are already anchored in Ahmedabad.

A major input to the city's growth and to the State as a whole has been the completion of the Narmada canal project. To add to these, the recent initiative to develop Delhi-Mumbai Industrial

(DMIC), Freight corridor, which passes through the city add necessary boost to the city's growth prospectus. In all, 14 SEZ's have received approval for location in the greater Ahmedabad region. Another 4 have received in-principal approval.

4.2.2.3. Land use

Spatial arrangements of activities determine the travel pattern in the city. The Ahmedabad Urban Development Authority is responsible for land use planning within its jurisdictional limits. As stated above, the area under AUDA may be seen as various subunits depending on the administrative jurisdictional limits and extent of development. This area is the focus in this study. Of the total AUDA area of 1294.65 sq. km, 50 percent is built up area. Water bodies and wastelands cover 12 percent and 17 percent of area respectively. Industries cover 9 percent of the area. As per the State Government Policy, no major industrial development within 24 km of AMC limit is permitted in AUDA area. Considering existing development conditions, certain area for industrial use is designated for light industry as well as for general industry, along with existing industries at Vatwa, Naroda and Odhav (all lying within AMC), which forms nearly 10.38 percent.

In AMC area, as per existing land use (1997), more than one third (36%) of the total area is under residential use, followed by 15 percent of the area under the industries. Large tracts of land (23.44%) are lying vacant, mostly in the newly acquired area of the AMC. Only 9.5 percent of the total area is under transportation network as against the norm of 15 - 18 percent as specified by UDPFI norms.

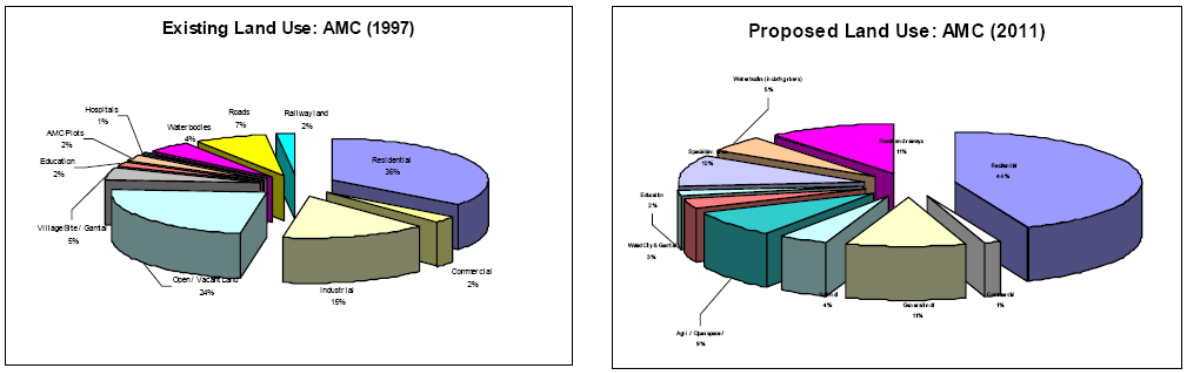


Figure 4-1: Existing and Proposed Landuse

4.2.2.4. Access to basic infrastructure

The water supply needs of Ahmedabad city are presently met from three sources as Surface water from Raska, French well in Sabarmati River, and intake well constructed in River Sabarmati (Narmada canal water is released in river which is pumped through intake well). A water treatment plant of capacity 650 MLD is installed at Kotarpur located in the north of the city. Water is supplied from Dudheshwar Water Works to the Central Transmission Mains while the Kotarpur Water Works supplies to the distribution stations in the three zones.

Extension of sewerage network to the old city was undertaken in a phased manner and by 1931 the entire old city area was sewered. Presently, around 75 percent of the municipal area is covered by 1384 km long sewerage network. There are 43 Sewage Pumping Stations, of which 8

are main Sewage pumping stations. At present, Ahmedabad generates about 500 MLD of sewage of which about 168 MLD is discharged into River Sabarmati without treatment through

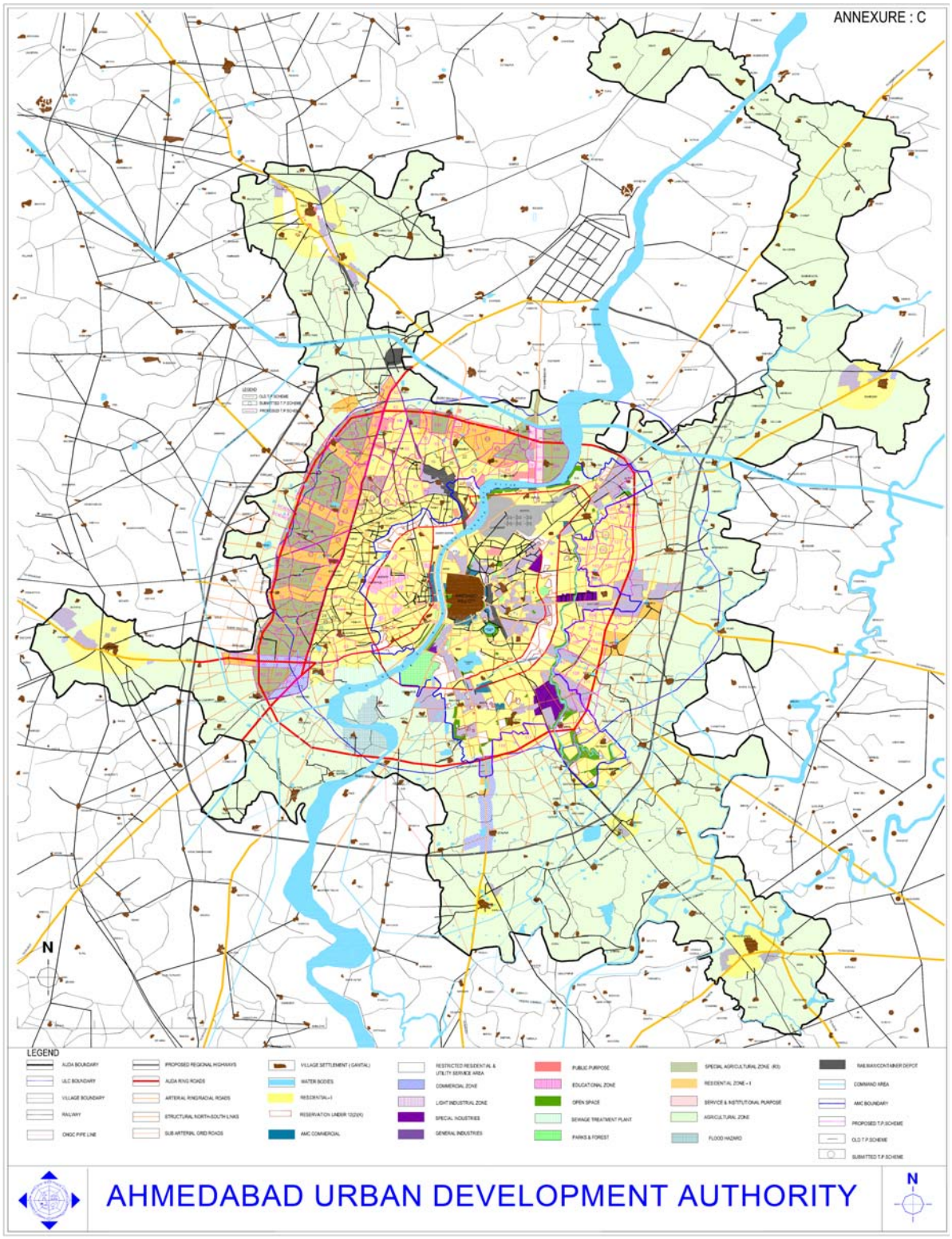


Figure 4-2: AUDA Proposed Landuse Plan, 2011

storm water outlets. In the newly merged areas of 92 sq.km of extended east Ahmedabad, sewerage facilities are provided in 44 sq.km area. Remaining 48 sq.km area is yet to be provided with sewerage facilities. There are two sewage treatment plants (aerated lagoons) at Pirana and Vasana having capacity of 180 mLd and 75 mLd respectively in eastern and western part of the city. In addition to above, recently two sewage treatment plants (UASB) of capacity 106 MLD and 126 mLd (36 mld for city & 90 for periphery) at Pirana (old) and Vasana (old) respectively were commissioned as a part of Sabarmati river action plan.

Solid Waste collection and disposal in Ahmedabad is being carried out by Ahmedabad Municipal Corporation as an obligatory function. The total waste generated in the city is of the order of 2100 tonnes per day. The work relating to the primary collection of waste (conservancy) has been decentralized at the zonal level.

4.2.2.5. Road and Transportation

Ahmedabad city is well connected by an expressway, several national and state highways, the broad-gauge and meter-gauge railways and an international airport. The city transportation system is predominantly dependent on roadway systems. Vehicular growth has been rapid. The network is experiencing heavy congestion. Consequently air pollution has become severe. Ahmedabad district has a total number of 12.9 lakhs motor vehicles registered in the year 2002. This went up to 19.4 lakhs by 2007 recording a compound growth rate of 8.5%. Of this 73% were two wheelers.

The study area roadway system is approximately 3650 km. Other than the National Highway Authority, which maintains National Highways and the State Roads and Buildings Department, the two urban local bodies; AMC and AUDA, are responsible for developing, operating and maintaining road infrastructure. The Ahmedabad Municipal Corporation manages a large road network of 2398 km, of which 93% are surfaced roads. Recent efforts at better management of the road network in the city have resulted in effective widening of the main corridors of the city. The road network in the central area (walled city of the AMC) is narrow and encroached upon by adjacent activities for parking as well as informal activities.

AMC invited private operators to participate in provision of public transport on a gross contract model (kilometre scheme). Since the AMTS was not able to meet the increasing demand of the fleet as well as increasing deficit, the private operators were asked to run the buses in 2005. As on Feb 2008, there are 538 buses operated by private operators and 484 by AMTS taking the total fleet to 1022. Daily passengers (boardings) have gone upto 936,886. This is a clear indication of latent demand waiting to be serviced.

4.2.2.6. Urban poverty

Urban and rural population below poverty line is 16 and 13 percent respectively as per the National Sample Survey 1999 - 2000. The comparative figures for the nation as a whole were 24 and 27 percent. The SJSRY survey conducted in Ahmedabad in 1998 was based on the understanding that out of the 32.4% of city's population living in slums, around 60% h/h fall below the poverty line. The average income of the slum households was Rs. 25,752 per year, which was higher than the revised official poverty line estimates, Rs. 24180, of the Government of Gujarat adopted in 1998 to estimate urban poverty under Swarna Jyanti Sahari Rojgar Yojna.The slum dwellers in the city occupy 8% of the total residential land. The physical environment, in

terms of housing conditions, availability of basic services determines the productivity and consequently the quality of life in urban areas. Although quite a significant proportion of the poor is above the traditional poverty line, they do suffer from other deprivations, especially in basic services and amenities. However the slums in the western zone are comparatively better off than the slums in the east.

Majority of slums are deficient in terms of basic facilities. Only 3.5 percent of the slum households have private water connections. There are 254 households per public stand post and 506 households per public toilet. One-fifth of the slum population have private toilets. 61percent of the households have electricity connection. One fifth of the population have access to primary medical facilities.

4.2.2.7. Heritage

Ahmedabad is endowed with a rich architectural heritage that is vital to the local identity and continuity of the place. The foremost heritage assets are the Indo-Islamic monuments of the 15th to 17th centuries: the Jama Masjid, the Teen Darwaza, the Bhadra Gate and Tower and the Tombs of Queen and King located in the historic core, the remaining sections of the original fort wall, 12 original gates and a number of other monuments protected by the Archaeological Survey of India (ASI). Besides these monuments, there are potential heritage precincts in the form of the Pols, the traditional residential clusters of the medieval period, which makes Ahmedabad exceptional. A large enclave of the Maratha period and many fine examples of colonial era architecture also survive in the Walled city.

4.3 HYDERABAD

4.3.1. Physical Environment

4.3.1.1. Physiography

Hyderabad is located 560 m above mean sea level. The city occupies an undulating topography with an elevation a minimum of 460 and a maximum of 560m AMSL. Musi River passes through the centre of the city dividing it into two parts along the south and north banks.

The climate is characterised by a hot summer and is generally dry except during the south-west monsoon season. The average annual rainfall in the district is 796.9 mm. The rainfall during the south-west monsoon months, i.e., from June to September constitutes about 78 per cent of the annual rainfall. September is generally the rainiest month. Temperatures begin to increase steadily from mid-February. May is the hottest month with the mean daily maximum temperature at 39.6^{O}C (103.3^{O}F). December is the coldest month with the mean daily maximum temperature at 28.6^{O}C (83.5^{O}F) and the mean daily minimum temperature at 13.6^{O}C (56.5^{O}F).

The well-developed national and regional rail-road network criss-crossing the city improved the access of Hyderabad to a number of key growth centres within and outside the state. Hyderabad has excellent domestic and international air link to the major metros of India and important international destinations.

4.3.1.2. Environmental Degradation

The rising levels of air pollution can be attributed to increasing vehicular population, which had seen an average decadal growth of almost 9% during 1991-2001. Concentration of SPM, RSPM, NOx and CO exceeds the prescribed limits for all the monitored locations. Deteriorating water quality is a major environmental concern. The domestic and industrial discharges finally end up in the water bodies, particularly in River Musi. A large number of water bodies suffer from urban industrial intrusions and the water quality in the lakes is degraded due to the discharge of the effluents without any treatment. The rapid industrialisation and uncontrolled exploitation of ground water is resulting in fast depletion of ground water resources. In addition, the ground water is infiltrated by harmful chemicals from the industrial effluents. Ground water in areas close to Katedan, Sanathnagar, Patancheru, Saroornagar and Jeedimetla industrial areas are infiltrated with hazardous substances and are unfit for human consumption. In a study on ground water pollution, it was found that the ground water is highly polluted with the concentration of calcium, magnesium, sodium and chlorides much higher than the permissible limits.

4.3.2. Biological Environment

There are 709 nos. of Colony parks / open spaces in Municipal Corporation of Hyderabad. Out of these, about 471 have been developed as tree parks and the remaining 238 nos. are set aside for colony parks.

4.3.3. Socio-Economic Environment

4.3.3.1. Demography and Economy

The population of Hyderabad Urban Agglomeration (HUA) increased from 4.3 million in 1991 to 5.7 million in 2001. HUA has a population density of 7393 persons/sq.km. Sex ratio in Hyderabad urban agglomeration is 938 in 2001, but it remains below the state average of 978. As per the Census, Literacy rate is around 78% in 2001. The workforce participation rate has been stable over the past three decades at 29%. The economy of Hyderabad is witnessing a transformation from traditional manufacturing towards a knowledge-based economy. This is primarily due to policies of the state government to promote knowledge sector and tourism through a series of initiatives and programs.

4.3.3.2. Land use

Residential area constitutes 44% followed by 12% under open ground and agriculture. The mixed use is around 6% and the area under roads is around 7%. The issues identified in Hyderabad CDP study, were absence of integration of spatial plan with infrastructure and services and; uncontrolled development in the surrounding ULBs.

4.3.3.3. Access to basic infrastructure

Over 90 % of population is covered with potable water supply in Municipal Corporation of Hyderabad (MCH) area and 65% in surrounding municipalities. Average per capita Supply is 162 lpcd in MCH area and 91 lpcd in surrounding Municipalities. The water system has high Non-Revenue Water levels averaging to 40% in MCH area and 60% in surrounding municipalities.

The existing sewerage system covers only 70% of the MCH area (prior to 1994) and is overloaded due to the growth of population of twin cities. Only 23% of the sewage generated is treated. The treatment capacities being inadequate result in discharge of untreated sewage into water bodies, particularly River Musi and Durgam Cheruvu and other nallahs passing by the city.

The drainage system in Hyderabad comprises a hierarchy of natural and man-made drains and water bodies that ultimately discharge surface run-off into River Musi and Hussain Sagar. In addition to storm water discharge, these drains are also being used to discharge sullage and septic tank overflows. Most of the drains are open and are choked with silt and garbage.

The HUA generates around 3379 tons of solid waste every day out of which MCH contributes 66% and surrounding municipalities contribute the rest at a per capita generation rate of 600 gm/cap/day. MCH shows a collection efficiency of over 91%, whereas, surrounding municipalities shows a collection efficiency of 95%.

4.3.3.4. Roads and Transportation

Three National Highways, NH9 (Vijayawada-Mumbai), NH7 (Bangalore- Nagpur) and NH-202 (Hyderabad-Warangal) pass through the CBD of the city. Five State Highways namely SH1, SH2, SH4, SH5 and SH6 start from the city centre and diverge radially connecting several towns and district head quarters within the State. The road network of Hyderabad is very dense and congested due to narrow roads, heavy encroachments, and high pedestrian and slow moving vehicle concentration.

Bus transport is the major public transport with modal share of 42% and merely 4% fleet. Three and seven seated autos acting as the Para transit contributing to nearly 10% of the transport demand. Private vehicles (two and four wheelers) mode share is about 50% of the total vehicular traffic. Increasing volumes of two and three wheelers, varying carriageway widths, congestion, low average journey speeds, delays at intersections due to non-standardized configurations, indiscriminate parking and general shortage of parking spaces are some of the issues plaguing Hyderabad transportation system.

4.3.3.5. Urban poverty

More than one-third of Hyderabad's population resides in slums and squatters. The BPL population is quite substantial and constitutes around 13 % of the total population. There are 1631 slums in MCH and surrounding Municipality areas. About one third of the slums have individual service connections and the rest depend upon public taps. A significant feature is that despite 90% coverage of slum areas with water supply lines, the individual service connections are less. Basic infrastructure facilities in the slum indicate that they are minimal and inadequate and need to be strengthened.

4.3.3.6. Heritage

The archaeological and historical places include the Golconda Fort, Qutb Shahi Tombs, Char Minar, Mecca Masjid and Falaknuma palace. In addition to the above, the High Court, the Osmania General Hospital buildings and the Salar Jung Museum are other major heritage monuments dotting the cityscape. The core area with Charminar in the centre is congested. MCH is undertaking pedestrianisation of the immediate area around the Charminar. The project involves restructuring the historic precincts with the provision of civic amenities, traffic

infrastructure, storm water drainage, introduction of heritage walks, pedestrianisation & beautification of Laad Bazaar, widening of ring roads, restoration of Pathergatti facades and a comprehensive signage system for Charminar precincts and restoration of Char Kamans.

4.4 INDORE

4.4.1. Physical Environment

4.4.1.1. Physiography

Indore City is located in the centre of Indore District. It is situated on fertile Malwa plateau, located at 22 43 N latitude, 76 42 E longitude. Indore is located at an average altitude of 550 m above MSL. The city of Indore lies in Khan River Basin. The river and its tributaries traverse the densely populated areas of the city. The city occupies a relatively flat plateau with a gentle slope towards the North.

The city enjoys a composite climate with extended hot humid period from July to September, winter period from November to February, summer period from April to June and a temperate climate from October to March. The climate of the area is typically seasonal. There are three distinct dry, wet and cold seasons. The mean daily temperature is about 25.1° C throughout the year.

4.4.1.2. Connectivity

Indore a nearly 2.0 million city today has transformed from a traditional commercial urban center into a modern dynamic commercial capital of the state. Indore city is linked by three modes of transportation viz. Road, Rail and Air; Regional road pattern fans out in all directions. The National Highway (Mumbai - Agra Road) passes through the city's habited area. State Highways and other roads connect the city with the State Capital Bhopal, all District Head Quarters of the Division and important towns within the District.

The city is, served by a broad gauge and meter gauge railway line. The Railway line passes through the heart of the city, which forms a physical barrier for, inter communications within the city. The city is also served by a regular air service connecting to major metros in the country.

4.4.1.3. Drainage

"The drainage of the city, is provided by the river system of Khan including the Rivers Khan and Saraswati along with their tributaries. Khan River originates about 11 km south of Indore. Three km from the origin, it is joined by the Saraswati River, which has its origin near Machal village. The confluence of the two rivers lies in the heart of the city near Krishnapura Bridge. Various Nallahs joining River Khan are Piliakhal Naliah, flowing through populated area from eastern Indore joins River Khan at Kulkarni Bhatta, Palasia Nallah flowing through western Indore joins Khan river near Sukhaliya village, Bhamori Nallah, another nallah flowing through eastern part joins Khan river at Kabit Khedi.

The rivers are non-perennial. After January, there is practically no flow beyond village Kelod. The domestic and industrial wastewater from the entire city has its outlet in the rivulets. This water is utilised for farming purposes in the downstream areas.

4.4.1.4. Environmental Degradation

Air quality is poor in the city of Indore. The value of SPM exceeds the prescribed limit of 200ug/m^3 in several residential and commercial areas. Water pollution is also very common with Khan River carrying the untreated domestic and industrial wastewater of the city.

4.4.2. Biological Environment

Though Indore has inadequate area under recreational spaces compared to the population needs, it is home to some major gardens and parks namely Nehru Park, Meghdoot Upavan, Bilawali Garden and Kamla Nehru Prani Sangrahalaya etc.

4.4.3. Socio-Economic Environment

4.4.3.1. Demography and Economy

The population of Indore is estimated at 16.39 lakhs (2001). The population density of the Indore Planning Area as per 2001 Census is as high as 1028 persons/ha. As per Census, literacy rate is 82%. The Workforce Participation Rate is 30% (2001). There is a distinct shift in workforce towards the tertiary sector. Among the industries, cotton textiles are the city's major product. The textile industry is on the decline and is being replaced by other industries like oil seed extraction industry, asbestos products, electrical machinery, bicycles and ready made garments. Some of the major concerns for the health of industries is power and water crisis along with poor transport infrastructure.

4.4.3.2. Land use

54% of the total area is under residential use while 14% is under transportation use. The city lacks adequate recreational spaces, as many parks proposed under the Master Plan have not been developed. Due to underutilization of land, laying down of infrastructure is expensive.

4.4.3.3. Access to basic infrastructure

The present water supply is from three main sources namely Bilawali tank, Yashwant Sagar Dam on Gambhir river and Narmada river. The net per capita supply of water to Indore is about 86 litres per day. Water supply coverage is 54%. The estimated UFW is 50% showing high amount of water loss due to leakage and unauthorized connections. With respect to sewerage and sanitation, 10% of the city is covered by a sewerage system. 43% of the population uses septic tanks while 5% of the population resorts to open defecation. Septic tank effluent is released in the open drains. Two STPs are operational. Regarding solid waste management, 500 tonnes of solid waste is generated per day. Collection efficiency is 70%. The waste is crudely dumped at Devguradia trenching ground, about 7km from the city. Only 20% of the city's roads have storm water drains.

4.4.3.4. Roads and Transportation

Important roads passing through Indore are NH-3, NH-51 and SH 27. The pavement quality of existing roads is fair. Congestion is common, as the peak hour traffic volume has far exceeded the existing road capacity. Vehicles have increased at an average growth rate of 8.8% per

annum in the period 1993-2000. The Intra city public transport is essentially road based provided by an estimated 300 private mini buses and 150 para - transit modes.

4.4.3.5. Urban poverty

Nearly 16% of the population lives in slums and squatters and about 15% live in unauthorized settlements. The city has around 444 notified slums. Half the slum population does not have access to toilet facilities and about one-fourth use public toilets, which are in deplorable condition.

4.4.3.6. Heritage

Indore has a rich cultural heritage dating back to the 15th century. The heritage buildings of the Holkar period are a fine blend of Mughal and Maratha architecture while the buildings of the British period have a colonial character. Rajwada, Lalbag Palace, Holkar's Chhatris, High court building, Indore museum, Mahatma Gandhi Hall, Pandharinaath temple, Harsiddhi temple are some examples of the urban heritage of Indore.

4.5 JALANDHAR

Jalandhar is situated between the fertile agricultural land of Rivers Beas and Sutlej. An important commercial hub of Punjab, it is located at a distance of 146 km from Chandigarh and at a distance of 350 Kms from Delhi on Delhi-Amritsar Highway. It is surrounded by Ludhiana district in East, Kapurthala in West, Hosiharpur in North and Ferozepur in South.

4.5.1. Physical Environment

It is characterized as the dry weather belt and is suitable for cultivating wheat and sugar cane. The average annual rainfall in the district is 703.0 mm. June is generally the hottest month with the mean daily temperature at about 41°C and the mean daily minimum at about 27°C. January is generally the coldest month with the mean daily maximum temperature at about 19oC and the mean daily minimum at about 6oC and July being the rainiest month. The city is vulnerable to earthquake as it falls in Zone IV of seismicity.

4.5.2. Socio Economic Environment

4.5.2.1. Demography and economy

Jalandhar city includes two municipal areas of Municipal Corporation and Cantonment Board spreading over an area of 101.43 sq. km. The total population is 741,744 with an average annual growth rate of 2%. The average population density in the city is 6913 persons per sq km. The city has a very high rate of literacy, both among males and females which is higher than both the national and state level averages. However, the sex ratio stands at only 860 which is lower than the national average.

The work participation rate in the city is 33.3% with 94.3% of all workers falling in main workers category. Males constitute 86% of the total workforce. The primary sector and the household industries account only for a small 8% of the total workers. The service and the industrial sector is main employer in the city with 92% of the workers employed. The city is a market for

agricultural products. It also has a number of manufacturing units which include textiles, leather goods, wood products, and sporting goods.

4.5.2.2. Land use

Prominent occurrence of mixed land uses in the city is a key feature. While the residential developments over the last few decades have been spreading outwards, the commercial activities are still concentrated in and around the inner city. The residential areas are marked by kots, and basties, which were, are areas dominated by Hindus and Muslims respectively.

4.5.2.3. Access to Basic Infrastructure

Roads and Transportation

The road length with in Municipal Corporation is 1284 km. There are presently no designated cycle lanes and pedestrian pathways exist only in few areas of the city. Connectivity of the city is provided by a good rail and road link. National Highway 1 and 1A pass through Jalandhar connecting it to the other important cities of Punjab and others in the neighbouring state of Himachal Pradesh and Haryana. The nearest Airport is Raja Sansi Airport at Amritsar located at a distance of 90 km.

4.6 MYSORE

4.6.1. Physical Environment

4.6.1.1. Physiography

Mysore is located at 770 m above sea level at 12.18° N 76.42° E and is 135 km from Bangalore, the state capital. It is situated on the Southern Karnataka Plateau. This region largely covers the area of the Cauvery River basin lying in Karnataka.

4.6.2. Biological Environment

There are 180 parks in Mysore covering approximately 9 sq. kms of the ULB. Another 8 sq. kms is covered by urban forestry. Adequate area is covered by parks and gardens. However, parks are in need of improved upkeep and maintenance, and only about a half of the available ones are used by the citizens. Karanji Lake and Kukrahalli Lake have been taken up for rehabilitation.

4.6.3. Socio-Economic Environment

4.6.3.1. Demography and Economy

The population of Mysore was 7.86 lakhs in 2001. The literacy rate of urban Mysore is considerably higher than that of the State average, at 82.8%. The economy of the city is largely based on tourism. The city is a host to an annual inflow of tourists to the tune of around 25 Lakhs annually. Other industries in Mysore include, manufacturing Tyres, Textiles, Electronic Systems, Bharath Earth Movers Ltd. (BEML), TVS, Silk Factory and Information Technology. Articles made of silk, lacquer, and Sandalwood are some of the most famous products of Mysore, making significant contributions towards commerce in Mysore.

4.6.3.2. Land use

The total area for Mysore city as per MUDA has shown an increase to 9221 hectares in 2001 from 7569 hectares in 1995, representing a growth of 22%. As per MUDA, the total area is further expected to increase to 15669 hectares by 2011, representing a significant increase of around 70 % over the total area in 2001. The city's growth in the recent years has been skewed towards southern Mysore. Around 40% of the present landuse is allocated to Residential land use while 16% is demarcated for transportation and 14% for Parks and Open Spaces. Currently, the city is undertaking GIS mapping to update land-use data and property details, and the Comprehensive Development Plan (master plan) is also being currently updated.

4.6.3.3. Access to basic infrastructure

85% of the households are covered by piped water supply system. Quantum of water supplied by the Corporation is about 135 lpcd. Unaccounted for water (UFW) is estimated to range around 50%; and it is estimated that there are over 20,000 unauthorized connections. 128 MLD of waste water is generated daily. 57% of the households are connected to the sewerage system. The total quantity of municipal sold waste generated in Mysore city ranges around 220 tonnes per day. The collection efficiency is estimated to be 80%.

4.6.3.4. Roads and Transportation

The network of roads and streets in Mysore follows a hub and spoke mechanism with arterial roads originating from the centre of the city i.e., the Palace area. Arterial roads start from the Palace area and run radially leading to towns and cities outside. The road network of the city includes three ring roads viz. outer ring road, intermediate ring road and inner ring road besides the arterials roads, subarterial roads, collector roads and others.

According to a survey, 25% of the households do not have vehicles, 28% have cycles, 48% have two-wheelers and cars are limited to 4% of the households. Intercity passenger trips indicate nearly two thirds of travelers on a work trip, while tourist and recreation trips constitute 12%. Nearly 36, 000 tourists travel in and out of the city each day.

4.6.3.5. Urban poverty

There are a total of 80 slums (declared and undeclared) in Mysore. The current population of declared slums in Mysore is estimated at 81,000. The number of BPL persons in Mysore comprises 19% of the total population of Mysore. 40% of the slum dwellers have easy access to water supply (within 50 metres) while 34% of slum dwellers have access to sanitation. 50% of the population is covered by Waste collection service.

4.6.3.6. Heritage

There are several palatial buildings originally built for the royal family, which now house the art gallery, Museums, luxury hotels, educational and research institutions and Government offices. Mysore is also famous for temples. There are few churches in Mysore built by the Europeans and St. Philomena's Cathedral, built in gothic style is notable among them. Mysore also houses a few mosques. The Kutchi Moimen mosque built by the traders from Kutch (Gujarat) is one of the more important ones. Some of the issues plaguing heritage in the city are land developments on

all sides, which have encroached upon the lung space and huge commercial constructions that are a threat to the heritage structures.

4.7 NAYA RAIPUR

4.7.1. Relief and Topography

In general, the region has a gentle topography with slopes ranging between 0 to 5%. The maximum elevation in the Region occurs close to Abhanpur in the south (320m) whereas the lowest areas in the Region are along the Kharun and Mahanadi rivers (260m). The drainage pattern in the region can be described as dendritic. The Region is flanked by the Kharun River on the west and the Mahanadi River on the east. The region is devoid of any substantial forest stretches.

4.7.2. Regional Landuse

The Region principally consists of agricultural lands of intensive use followed by uplands and barren lands. By and large, agricultural lands are found along the rivers and numerous streams that have better soil and moisture conditions.

4.7.3. Environmental Concerns and pressure areas

There are no pristine natural habitats within the Region. The only areas of concern are small forest patches to the north and northeast and the two major rivers of the region as these are the most important sources of water supply and source of irrigation. Controlling pollution is the most important concern in this case. Limestone mining activities in the area are also an environmental concern as it gives rise to land, water and air pollution. This Region is therefore, an ecologically sensitive zone.

4.7.4. Road Transport System

Three National Highways namely NH-6, NH-43 and NH-200 pass through the capital city region and these are the busiest highways of the state. Most of the goods traffic within the state moves on these highways. With the formation and full functioning of the new capital city, the traffic flow intensity on these corridors is expected to grow further. Mode wise distribution of the traffic shows that the percentage share of goods vehicle varies from 47% to 50% on National highways where as the percentage share of passenger vehicles varies from 71% to 79% on other roads.

With the coming up of administrative functions in the new capital city it is estimated that the new capital city will have high interaction with other district headquarters. On the other hand with the location of High court at Bilaspur and other administrative functions in the new capital city interactions between these two urban centres are expected to grow manifolds. Thus, it is important to enhance the connectivity of these areas, through a combined strategy of construction of new links and upgradation of existing corridors.

4.7.5. Rail network

The South-Eastern railway operates on the rail network in Chhattisgarh and the nearest rail head to the new capital city is at Raipur.

4.7.6. Air transport

The air transport in the State is quite limited. There is only one major airport in the State, connecting the city of Raipur. The airport connects Raipur with New Delhi and Nagpur by daily flights and with Mumbai and Bhubaneshwar by tri-weekly flights.

4.8 PIMPRI-CHINCHWAD

Details to be obtained from project DPR – expected by end of Jan09

4.9 PUNE

4.9.1. Physical Environment

4.9.1.1. Physiography

Pune is situated near the Western margin of the Deccan Plateau. It lies on the leeward side of the Sahyadri ranges and Western Ghats, 560 m above the sea level, at the confluence of the Mula and Mutha rivers. The total length of the Mutha River within the city limits is approximately 8 km. Two more rivers, Pavana and Indrayani, traverse the Northwestern outskirts of the urban area. The Sinhagad - Katraj - Dive Ghats range forms the southern boundary of the urban area. Pune lies in the seismically active zone of Koyna Region, which is located about 100 km south of Pune.

4.9.1.2. Environmental Degradation

In Pune, the main cause of air pollution is large vehicle ownership. Nearly 34% of the daily emission of CO is contributed by the growing two-wheeler vehicular population. Water pollution is also a major concern. The high level of pollution in Mula - Mutha River is due to the disposal of untreated domestic sewage and other activities like the washing of clothes, animals and vehicles; the release of foam, alkaline and other detergents also accounts for the deterioration in the quality of water.

4.9.2. Socio-Economic Environment

4.9.2.1. Demography and Economy

The population of Pune city as per Census 2001 is close to 25 lakhs. The city has a population density of 10,412/sq.km as per the 2001 census. Pune has a literacy rate of 77% as per the last Census. The workforce participation rate (main and marginal workers) in Pune Municipal Corporation (PMC) is 34%. Of the total workforce, over 30% is employed in other services indicating the strong presence of the service sector in Pune, which includes the IT sector. The manufacturing and processing industry, which employs about 25% of the workforce, is again a strong indicator of manufacturing economic activity. The sectors that are vibrant in Pune are auto, auto components, forgings, mechanical components, food processing and service industries like IT and IT enabled services.

4.9.2.2. Land use

The current area of Pune Municipal Corporation jurisdiction is 243.96 sq km. The combined land use distribution as per both the Development Plans indicates that about 42 % is allocated for

residential use. The land use plan indicates that about 13 % of the area is allocated for transport, and 12 % is for reserved and forest areas. Haphazard development, both for residential and industrial purposes, is a problem in the newly added areas.

4.9.2.3. Access to basic infrastructure

The service levels with regard to water supply are fairly good in Pune (a gross supply of over 260 lpcd and a net supply of 182 lpcd accounting for 30% distribution loss). In terms of coverage about 85–88% of the population has access to the piped water supply system. The areas, which are not covered, are the fringe areas like Kharadi, Kondhwa, Bavdhan and other far-flung areas. The quantity of sewage generated is in the range of 416-448 MLD. The sewer network covers about 54% of road length and 80% of the present population. Almost one-third of the total sewerage generated remains untreated and is disposed off into the Mula-Mutha River. With respect to solid waste management, the total quantity of waste generated per day is about 1000-1200 tonnes out of which nearly 600 tonnes is further composted. The key issues with regard to the storm water drainage system in Pune are its inadequate tertiary drains. There is significant silting and obstructions in the primary and secondary drains, hampering natural flow channels.

4.9.2.4. Roads and Transportation

NH-4 passes through the city along with other State Highways. The road network in the city is primarily radial and rectilinear/ circumferential. Narrow roads in the central and core areas of the city with restricted capacity add to congestion problems. Poor road surface quality and absence of appropriate safety and visibility enhancement parameters like signage, markings, channel islands, street name boards and other street furniture endanger the safety of the commuters. Only 40% of the roads have footpaths and most of the existing ones are encroached upon by informal activities and street hawkers.

In the last four decades, the population of the city has increased four times whereas the vehicle population has increased 87 times and the road length has increased by only five times. The vehicular composition indicates that 75% of the total vehicles are two-wheelers, followed by four-wheelers at 13% and three-wheelers at 6% of the total registered vehicles in the city. 53% of the work trips are performed by two-wheelers and bicycles. The existing public transportation system falls short while catering to the rising demand. Only 15% of the vehicle kilometers travelled in the city is accounted for by public transportation.

4.9.2.5. Urban poverty

The urban poor population (slum population) in Pune is estimated at about 30-35% of the total population of the city. There are 564 slums in Pune city, of which 353 are declared and 211 undeclared slums. This growth in the composition of slum population could be attributed to non-availability of housing stock at affordable costs, leading to the emergence of a large number of slums. A substantial number of slums are located along the riverbed, hills tops and other environmentally sensitive areas. Most of the slum households either have direct access to services or access them through community or common facilities. Over 58% of the households have individual water supply connections. The rest are dependent on public stand post (PSP). In terms of sanitation facilities, person dependent on each seat is around 84; at overall level, the

service level is marginally poor. Access to electricity connections is fairly good. 93 % of households have access to some form of electricity connection.

4.9.2.6. Heritage

Pune was under the rule of the Peshwas as well as the Britishers for a long time. Thus the heritage structures in Pune can be broadly divided into those of the Peshwa period and the British period. Within the PMC area, the core city is dominated by heritage precincts. A heritage precinct is a distinct urban pattern consisting of open spaces, streets, trees, platforms, shrines, groups of buildings etc. A few important heritage precincts are Tulshibagh, Shaniwarwada, Tambat Ali, Shimpi Ali, Parvati, Mahatma Phule Mandai, Gosavipura, parts of Sadashiv Peth and Ravivar Peth. The individual buildings of heritage importance fall into varied categories such as wadas (Vishrambaug, Nana, Raste), temples (Tulsibagh Ganapati, Belbaug, Kasba Ganapati, Bhavani), institutions (Panch Houd Mission, Hari Mandir, Kanya shala, Nagar Wachan Mandir) and public utilities (City Post Office, Gokhale hall). The various natural/manmade streams (Ambil Odha, Nagzari), water supply systems (Katraj, Raste, Ambegaon aqueduct) and the river Mutha form an intrinsic part of the heritage.

4.10 THIRUVANANTHAPURAM

4.10.1. Physical Environment

4.10.1.1. Physiography

Thiruvananthapuram is a city of hills and valleys, the ground level varying from 0 to 76 m above mean sea level. The city region consists of a number of rivers and canals, both natural and man made. Karamana and Killi are the major rivers passing through the city. Both the rivers run from north-east to south-west skirting the city and before meeting the sea form some islands, mainly Edayar Island and water lagoons.

4.10.1.2. Environmental Degradation

The quality of air is broadly satisfactory in the city as measured by Kerela State Pollution Control Board. However the Respirable Suspended Particulate Matter (RSPM) & Suspended Particulate Matter (SPM) occasionally exceeds the quality limits. The trend shows that the concentration of the pollutants is steadily increasing mainly due to increase in the density of vehicular population.

The three main surface water bodies in Thiruvananthapuram are the Karamana River, Killi River and the Parvathy Puthanar, a man made canal. All these water bodies are contaminated with coliform indicating contamination due to sewage. The river banks are encroached and solid waste is dumped indiscriminately in the rivers. Raw sewage from the individual plots and occasionally from the City Sewerage System is let off into these rivers. Ground water is the primary source for domestic consumption in the newly developed areas but over extraction has resulted in brackish water, especially along the coastal belt. In Thiruvananthapuram, one of the main reasons for coastal pollution is the discharge of untreated domestic wastes due to lack of treatment facilities.

4.10.2. Biological Environment

Most of the public and semi-public spaces are concentrated in and around the central area of the city. There is lack of adequate organised open spaces at zonal levels.

4.10.3. Socio-Economic Environment

4.10.3.1. Demography and Economy

As per 2001 Census, the population of Thiruvananthapuram City Region (TRIDA Area) is 11.3 lakhs. The average population density in TRIDA area is 3026 persons per sq. km and that of the Thiruvananthapuram Corporation Area(TCA) is 5256 persons per sq. km. The literacy rate in TCA is 84%, which is less than the State average of 91%. The Work Participation Rate for the city was around 32% in 2001. In the recent past, the State has made serious efforts to identify new opportunities and equip it to meet the emerging challenges. The industrial infrastructure & facilities offered by the State include industrial parks and industrial estates. About 50 ha of land was developed under this category in the TRIDA area, of which 25 ha have been allotted, creating employment for 3,500 persons. Though Kerela is an important tourist destination, Thiruvananthapuram, functions mostly as a transit point for domestic and foreign tourists.

4.10.3.2. Land use

Maximum area is under residential land use (38%) followed by agricultural land use (30%). Around 7% of area is under transportation land use. Areas like Sreekariyam, Kazhakuttom and Kudappanakunnu are under pressure for further urban growth but do not have a sufficient level of infrastructure and development control. This has resulted in the conversion of agricultural land and filling / reclamation of water bodies for urban use. One of the major areas of concern is that individual plots are being developed into multi-storied apartment / commercial buildings, thereby exerting lot of strain on the existing infrastructure.

4.10.3.3. Access to basic infrastructure

Karamana River is the source of water for the Thiruvananthapuram water supply scheme. It is estimated that the consumers of Thiruvananthapuram are supplied water @174 lpcd. The present scheme area covers the entire Thiruvananthapuram City.

Thiruvananthapuram Sewerage Scheme [TSS] covers the old city area, with an extent of 74.93 sq. km with 50 wards area. Sewage disposal methods from the households in un-sewered areas of the Corporation include septic tanks, borehole latrines and community toilets. There are also many houses without any sanitation facilities. Presently the sewage generated in the city is carried through a number of gravity mains and pumping mains to the stilling chamber at Muttathara. From the stilling chamber, the sewage flows by gravity to the sewage farm on the other bank of Parvathy Puthanar Canal and is let off into open drains for use in fodder cultivation.

About 270 MT of Municipal solid waste is generated in Thiruvananthapuram Corporation every day. The per capita waste generation is estimated to be 350 g/cap/day. Collection efficiency is around 60%.

4.10.3.4. Roads and Transportation

The city has five major regional roads namely NH-47 (Kanyakumari-Salem), SH 1- M.C. Road (Main Central Road), State Highway to Shenkottah (in Tamil Nadu border), Thiruvananthapuram-Kattakada road, Thiruvananthapuram-Vizhinjam-Poovar road. All these five regional roads radiate from the city and the other major roads of the city connect these roads as ring roads. The Thiruvananthapuram city by-pass for NH-47 is aligned along the coast from Kazhakuttam Junction to Kovalam-Vizhinjam and Parasala meeting NH-47 at Parasala. The total road length in TMC area is 2586 km of which 56% are surfaced. Problem of congestion on main roads and intersections is a result of a combination of factors. Most of the arterial roads have inadequate capacity, substandard road geometry and carry a significant amount of intercity traffic in addition to the local traffic. Inadequate parking facilities, absence of pedestrian facilities, poor road geometry, and absence of by-pass or ring roads, absence of delineated hawker zones are some of the prime issues.

The modal distribution of the trips performed by the residents show a heavy dependence on personalized vehicles inside the city area. The city bus service is mainly operated by the Kerala State Road Transport Corporation (KSRTC) and supplemented by private bus operators. The mode split of KSRTC is 9% and the modal split share caters to more than 35%. This indicates that the existing bus system is unable to cater to the peak hour passenger demand, resulting in overcrowded buses, long waiting time and slower speeds. Lack of efficiency in intra-city Public Transport System has forced people in the middle and lower income groups to opt for IPT. The most popular mode of IPT is the three-wheeler (auto rickshaw). However, increasing use of auto rickshaws within the city area tend to increase traffic congestion and accidents.

4.10.3.5. Urban poverty

The number of BPL persons in Thiruvananthapuram comprises 26% of the total population of Thiruvananthapuram. 355 un-notified slums and slum like housing areas within the city have been identified. Other dimensions of urban poverty include lack of access to basic amenities and services, unsanitary living conditions, overcrowding and exposure to various risks of disease. Nearly 50% of the slum population does not have access to piped water while 14% do not have access to private toilets.

4.10.3.6. Heritage

Thiruvananthapuram the capital city of Kerala State has a continuous cultural heritage of more than thousand years. It was an important town during the period of the kingdom of Venad (between the 12th century and 18th century) and later it became the capital of Travancore state from 1800 AD. The heritage of the city covers traditional residential streets, planned fortified settlement, temples, churches (during the colonial period), historic palaces, ponds/sacred tanks, educational institutions, historic public buildings, historic public gardens and remains of old cantonment. Among the areas of heritage significance, the Fort area, Palayam area, Shanghumughom area and Thycaud area are the noted ones. The issues are: a) Lack of adequate regulatory mechanism to conserve heritage structures and precincts and to notify them as protected. b) Making available the traditional building materials for the maintenance of heritage structures and also services of skilled traditional craftsmen c) Threat due to climatic variation, termite attack, fire etc. d) In order to maintain the heritage value of the city, owners of

private heritage buildings are often not permitted to build and earn in tune with the development trend in that area which calls for incentives as compensatory measures. e) Sensitisation on the need for conservation of Heritage buildings and precincts.

Chapter 5. Potential Environment and Social Impacts

This section details out the potential environmental impacts of the projects funded by GEF under the Sustainable Urban Transport Project. The environmental impacts identified at this stage are preliminary in nature and will need to be further elaborated and potential for occurrence has to be ascertained during further stages of project design and implementation. The potential impacts are identified during various stages of the project location, design, construction and operation as their potential nature, extent, duration and severity differs between the nature of projects and stages.

Having categorised the potential impacts by the stage of the project, which are mostly generic to various projects under GEF, impacts that are specific to a project type are further elaborated in the appropriate stage of their occurrence.

5.1 INTRODUCTION

Screening for identification of environmental and social impacts is undertaken. The significance of environmental and social impacts is ascertained at this stage. While environmental impacts identified are preliminary in nature, potential for occurrence has to be ascertained during further stages of project design and implementation. The potential impacts are identified during various stages of the project location, design, construction and operation.

5.2 SCREENING AND IDENTIFICATION OF IMPACTS

Environmental and social screening conducted as part of the ESMF is intended to provide inputs into identification of potential impacts with the implementation of the GEF-SUTP project interventions. Identified potential impacts were further analysed and likelihood of management of these impacts is identified. Screening is conducted by identifying the interaction of environmental components on the project activities for various project cities. Screening conducted for the identified subprojects and respective impacts identified are presented in the **Table 5-1**. The impacts identified for the project components in the GEF-SUTP are presented in the **Table 5-2**.

Table 5-1: Environmental and Social Screening of Potential Impacts

City	Component	Environmental impacts				Resettlement impacts		
		No impacts	Construction impacts	Cultural resources	Sensitive areas	No impacts	LA Impacts	Non-titleholder impacts
Ajmer-Pushkar	Pedestrian facilities	x	√	√	x	x	x	√
	Vehicle Parking facilities	x	√	x	x	√	x	x
	Pedestrian subway	x	√	x	x	x	x	√
	Pedestrian Signals and junction improvement	x	√	x	x	x	x	√
	Road markings and signages	√	x	x	x	√	x	x
	Street Lighting	√	x	x	x	√	x	x
Ahmedabad	Supply & Installation of ITS for GPS control of AMTS Buses	√						
	Control Centre Development	x	√	x	x	√	x	x
Hyderabad	Footpaths	x	√	√	x	x	x	√
	Pelican signals	√	x	x	x	√	x	x
	Road markings and signages	√	x	x	x	√	x	x
	FOB	x	√	x	x	x	x	√
	Vehicle Parking facilities	x	√	x	x	√	x	x
Indore	Bus signal prioritization	√	x	x	x	√	x	x
	Automatic Fare Collection	√	x	x	x	√	x	x
Jalandhar	Footpaths	x	√	√	x	x	x	√
	Cycle Tracks	x	√	√	x	x	x	√
	Road Markings and Signage	√	x	x	x	√	x	x
Mysore	ITS for City services	√	x	x	x	√	x	x
	Retrofit for Biofuel and storage depots	√	x	x	x	√	x	x
Naya Raipur	Bus lanes for BRTS	x	√	x	√	x	√	√
	FOBs	x	√	x	x	x	√	√
	Terminals	x	√	x	x	x	√	√
	Bus Fleet	√	x	x	x	√	x	x
	Bus Shelters	x	√	x	x	x	√	√
	PIS	√	x	x	x	√	x	x
Pune	Cycle network	x	√	√	x	x	x	√
	NMT network as feeder to BRTS	x	√	√	x	x	x	√
	NMT underpasses	x	√	√	x	x	x	√
Pimpri - Chinchwad	Bus lanes for BRTS	x	√	x	√	x	√	√
	FOBs	x	√	x	x	x	√	√
	Terminals	x	√	x	x	x	√	√
	Bus Fleet	√	x	x	x	√	x	x
	Bus Shelters	x	√	x	x	x	√	√
	PIS	√	x	x	x	√	x	x

City	Component	Environmental impacts				Resettlement impacts		
		No impacts	Construction impacts	Cultural resources	Sensitive areas	No impacts	LA Impacts	Non-titleholder impacts
Trivandrum	Chalai Pedestrian Precinct and peripheral parking facility	x	√	√	x	x	√	√
	Elevated pedestrian walkway	x	√	√	x	x	√	√

	Projects with environmental and resettlement impacts
	Projects with environmental impacts and impact on non-titleholders but does not involve land acquisition
	Projects with only generic construction impacts and no R&R impacts
	Projects with no impacts on either environment or resettlement

Table 5-2: Impacts identified in the subprojects of SUTP

Broad Project Category	Activities / Sub-components	Cities	Impacts
Pedestrian / NMT Infrastructure Improvement	Reconstruction of footpaths	Ajmer, Pune, Jalandhar, Hyderabad, Pimpri – Chinchwad	a. Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times b. Temporary increase of noise levels due to idling and traffic snarls c. Removal of squatters and encroachers from the footpaths causing livelihood losses – even though they are illegal d. Loss of shelter for temporary shops / residences for squatters and encroachers e. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
	Provision of Sub-ways / FoBs	Ajmer, Trivandrum, Hyderabad, Pimpri – Chinchwad	a. Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times b. Temporary increase of noise levels due to idling and traffic snarls c. Alternate traffic diversion routes increasing route length and consequently emissions d. Alternate traffic diversion routes exposing previously low traffic routes to higher urban traffic and increasing air / noise pollution e. Removal of squatters and encroachers from the footpaths causing livelihood losses at approaches to the sub-ways / FOBs f. Loss of shelter for temporary shops / residences for squatters and encroachers at approaches to the sub-ways / FOBs g. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
	Pedestrian Prioritization measures through traffic signals, pelican lights, road marking etc.	Ajmer, Pune, Jalandhar, Hyderabad, Pimpri-chinchwad	a. Increase in signal time for red causing increase in idling and emissions from vehicles / noise b. Improvement in safety of pedestrians due to measures proposed
	Construction of new footpaths	Ajmer, Pune, Jalandhar, Hyderabad, Pimpri – Chinchwad	a. Acquisition of land for footpaths causing resettlement impacts and loss of livelihood b. Relocation of road appurtenances and utility lines c. Temporary interruption to traffic causing air and noise pollution d. Loss of adequate frontage to commercial / residential establishments e. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
	Paving and Delineation of areas as pedestrian friendly	Ajmer, Pune, Jalandhar, Hyderabad, Trivandrum,	a. Contamination of runoff from paving areas with construction material as sand / cement / silt from stacked excavated earth b. Improvement in pedestrian safety

Broad Project Category	Activities / Sub-components	Cities	Impacts
	precincts	Pimpri – Chinchwad	c. Loss of usual transport routes due to delineation of pedestrian routes to NMT – bicycles / cycle rickshaws forcing them onto other roads increasing risk of accidents
	Peripheral Vehicular Parking	Ajmer, Trivandrum	a. Increased safety of pedestrians b. Improvement of air / noise quality in the core areas of cities c. Increased land requirement for parking – causes removal of squatters and encroachments and loss of livelihood / shelter d. Land acquisition causing R&R issues – loss of livelihood, loss of shelter, severance of community / social links e. Increase in traffic – noise and air pollution in the periphery of core city areas
	Construction of cycle lanes	Jalandhar, Pune, Pimpri – Chinchwad	a. Land acquisition for cycle lanes will cause R&R issues b. Use of existing pavement width for delineation of cycle lanes will cause removal of squatters and encroachments from roadsides causing loss of livelihood and loss of shelter c. Paving of cycle lanes with bitumen will be causing construction issues as: 1. Generation of noxious gases during construction – increasing air pollution 2. Temporary increase in noise pollution during construction 3. Contamination of road runoff with construction material stacked on road side 4. Traffic safety during construction 5. Traffic diversions causing lengthening of routes increasing air emissions and exposing previously unexposed neighborhoods' to noise d. Reduction of additional lane width for motorized vehicular traffic if existing road width is used for demarcating the cycle lanes
	Street Furniture-Lighting, Bollards etc	Ajmer, Jalandhar, Hyderabad, Trivandrum, Pune, Pimpri – Chinchwad	a. Minor construction issues only. Improves safety of precincts with introduction of bollards and adequate street lighting
	Bus-Stops, Signage etc	Naya Raipur, Pune, Pimpri - Chinchwad	a. Improvement in safety of pedestrians
Public Transport Infrastructure	Dedicated Bus-lanes	Naya Raipur, Pimpri – Chinchwad	a. Land acquisition for dedicated lanes will cause R&R issues b. Use of existing pavement width for dedicated bus lanes will cause removal of squatters and encroachments from roadsides causing loss of livelihood and loss of shelter c. Construction / reconstruction / improvement of bus lanes will be causing construction issues as: 1) Generation of noxious gases during construction – increasing air pollution

Broad Project Category	Activities / Sub-components	Cities	Impacts
			2) Temporary increase in noise pollution during construction 3) Contamination of road runoff with construction material stacked on road side 4) Traffic safety during construction 5) Traffic diversions causing lengthening of routes increasing air emissions and exposing previously unexposed neighborhoods' to noise d. Reduction of additional lane width for other traffic if existing road width is used for demarcating the dedicated bus lanes e. Reduction in private vehicles causing reduction in air / noise pollution
	Terminals/Depots/ Commuter Amenity Centers	Naya Raipur, Pimpri – Chinchwad	a. Acquisition of land for the facilities causes – R&R issues as loss of livelihood, loss of shelter, severance of community & social ties b. Increase of noise and air pollution in the areas of terminals and depots c. Improvement in approaches to the terminals and depots causing impacts on adjacent landuses and land acquisition d. Additional land acquisition, if any for the approach road improvement will lead to R&R issues along the roads and cause impacts on livelihood and shelter e. Construction stage impacts include the increase in air and noise pollution f. Contamination of road runoff with stacked construction materials g. Improvement of traffic conditions during operation stage causing reduction in air and noise pollution
	Bus-Stops and FOBs/Sub-ways	Naya Raipur, Hyderabad, Ajmer, Pimpri – Chinchwad	a. Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times b. Temporary increase of noise levels due to idling and traffic snarls c. Alternate traffic diversion routes increasing route length and consequently emissions d. Alternate traffic diversion routes exposing previously low traffic routes to higher urban traffic and increasing air / noise pollution e. Removal of squatters and encroachers from the footpaths causing livelihood losses at approaches to the sub-ways / FOBs f. Loss of shelter for temporary shops / residences for squatters and encroachers at approaches to the sub-ways / FOBs g. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
	Procurement of Bus Fleet	Naya Raipur, Pimpri – Chinchwad	a. Improvement in urban air quality

Broad Project Category	Activities / Sub-components	Cities	Impacts
	Traffic Signal Prioritization	Naya Raipur, Pune, Pimpri – Chinchwad	a. Pedestrian safety issues from reduction of signal times for pedestrians
ITS application to Public Transport	Traffic Signal Improvements	Indore, Mysore, Pimpri – Chinchwad	a. Improvement in traffic flow and reduction of air / noise emissions
	Automatic Fare Collection	Indore, Mysore	a. Minor construction issues in erecting the necessary infrastructure for fare collection
	Public Information System-Plasma Screens, Display boards at bus stops etc	Indore, Mysore	a. No impacts anticipated
	Control Rooms	Indore, Mysore, Ahmedabad,	a. Acquisition of land for construction of control rooms may cause R&R issues
Others	Retrofitting of Bus Fleet	Mysore	a. Would improve air / noise quality in the urban areas
			a. No negative impacts anticipated
			a. Aids in reduction of air emissions
Others-Road Infrastructure	Junction/Rotary Improvements	Jalandhar, Ajmer, Pimpri – Chinchwad	a. Additional land requirement for junction improvements will cause R&R impacts as loss of livelihood and loss of shelter b. May cause removal / displacement of squatters & encroachers c. Air and noise pollution from construction impacts d. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
	Rail Over Bridges	Ajmer	a. Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times b. Temporary increase of noise levels due to idling and traffic snarls c. Alternate traffic diversion routes increasing route length and consequently emissions d. Alternate traffic diversion routes exposing previously low traffic routes to higher urban traffic and increasing air / noise pollution e. Removal of squatters and encroachers from the footpaths causing livelihood losses at approaches to the sub-ways / FOBs f. Loss of shelter for temporary shops / residences for squatters and encroachers at approaches to the sub-ways / FOBs g. Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth

5.3 LOCATION IMPACTS

The location Impacts being analysed are associated with site selection and project location on environment and resettlement or livelihood related impacts on communities. Some of the generic

impacts associated with location of project facilities that involves construction activities either by acquiring additional land and / or public land encroached by residents are as below:

- Major environmental features as lake fronts, parks etc., in the urban areas would generally be avoided and hence environmental impacts on these areas would be minimal to absent
- Project cities do not have any major environmental features that are sensitive to acquisition of land as it is nominal in case of the conceived projects
- Removal of encroachments and squatters leading to loss of livelihood and / or shelter
- Vulnerable PAP within the encroachers would be further impacted by the pressure of relocation as well as loss of income and their removal
- Breakup of established social fabric and cause severance of established relationships amongst the community
- Temporary loss of services provided by the encroaching PAPs due to their removal

Some of the specific impacts associated with construction of FoB / RoB involves disruption to existing traffic flow, especially, if located in the congested urban stretches. These would also involve land acquisition (either temporary or permanent) and would also impact the squatters and encroachers affecting residences and / or livelihood.

Construction of the FoB / RoB would cause traffic congestion and delays and may also involve changes in the project design and alternatives. Project interventions as ITS application, improvement in public transport infrastructure would only improve the environment rather than causing pollution though resettlement impacts would be present to a limited extent.

5.4 DESIGN IMPACTS

Design impacts arise due to the intrinsic nature of project design, including the technology used, scale of operations, discharge standards etc. Design impacts in case of the project interventions are usually positive in nature causing reduction of air and noise emissions leading to general improvement in the environment. Designs generally are intended to provide optimum environmental benefits but would also involve environmental and social impacts due to the project. Specific environmental and resettlement impacts associated with the project designs are presented in the paragraphs below.

Positive design impacts are anticipated on the environment with several NMT infrastructure developments as reconstruction of footpaths, provision of subways, paving / delineation of areas as pedestrian friendly precincts, street furniture and lighting. Similar positive impacts are anticipated in case of provision of feeder services as procurement of low emission vehicles, ITS and provision of bus stops. Limited or positive design impacts on environment are likely from the improvements in public transport fleet by retrofitting or reorganization of cycle rickshaw etc.

Design impacts on environment and resettlement aspects are anticipated in case of active measures as construction of new footpaths, provision of parking facilities, and construction of exclusive cycle lanes. The impacts would mostly be limited to unavoidable impacts as increased traffic movements in the areas surrounding the parking facilities causing emissions and elevated noise levels. Due to general lack of adequate space in urban precincts, it is conceived to allocate designated parking spaces to avoid congestion in the whole area. This would involve relocation of few PAPS who are otherwise continuing with their livelihood or residential activities.

Construction of cycle lanes through designation of dedicated lanes for use of cycles is an environment friendly option for intra city movements and is effective for short trips. Relocation impacts on titleholders are likely with the necessity for space in urban areas to undertake their construction. However, in case of designation of available RoW as exclusive cycle lane would involve fewer resettlement impacts and will mostly be limited to non-titleholders. Hence, finalisation of the design option would provide necessary inputs into impact determination on environment and resettlement aspects in this sub-project.

Planning for terminals, minor road improvements and junction / rotary improvements would involve design impacts as any of these activities would require land and consequently environment and resettlement impacts are likely. Some of the typical design impacts due to such project interventions are:

- Speculation of land prices, more specifically in case of terminals and road improvements is an identified impact which is both beneficial as well as harmful – induced impacts is an intrinsic benefit of the development projects however, speculation of land prices causes undue rise in project costs if land is to be acquired and hence a harmful affect
- Environmental impacts from design of the project components would mainly be due to design inconsistencies, if any as the proposed project designs would consider optimal environmental solutions to environmental impacts. Design optimization towards cost and environment would mostly involve minor impacts on environmental resources of the project areas a acquisition of part of a water body towards construction of foot paths
- Psychological distress to potential PAPs is considered a major impact during or due to design. This is especially due to the ground works as undertaking surveys and investigations while PAPs are not fully equipped to assimilate the ongoing improvement programme.

Analysis of alternative design options have to explored to minimise design impacts and bring about an environmentally friendly and socially acceptable option for the interventions proposed.

5.5 CONSTRUCTION IMPACTS

Impacts resulting from pre-construction and construction activities including site clearance, earthworks, civil works, etc are identified in this section. Pre-construction and construction impacts arise due to dismantling of existing facilities, use of heavy construction machinery, spillage / disposal of construction debris, runoff from construction site, inadequate or inappropriate drainage of the construction site, inadequate safety measures etc. These are some of the direct impacts of construction in the project area.

In addition to the above, there are few indirect impacts or impacts that result from construction activities though not causing the impacts, support to cause the impacts. Some of these impacts include, generation of vectors and vector borne diseases, spread of STD / HIV amongst the construction workers and within the community in the vicinity of construction activities etc. The above environmental impacts are generic in nature occurring along all the project activities where civil works are involved. Impacts that are specific to the construction activities in a project intervention are presented below.

- Construction activities in case of reconstruction of footpaths or construction of new foot paths would cause temporary interruption to traffic and increase of emissions from vehicles due to higher idling times apart from temporary increase of noise levels due to idling and traffic snarls
- Alternate traffic diversion routes in case of construction of exclusive bus lanes, cycle tracks would cause increase in route lengths and consequently emissions. Providing alternate traffic diversion routes

also expose previously low traffic routes to higher urban traffic increasing air and noise pollution on these routes

- Loss of adequate frontage in few cases of foot path construction or provision of additional cycle lanes and bus lanes
- Relocation of utilities in the pre-construction stage causing temporary disruption to services. These impacts would be more severe in case of construction of exclusive bus lanes and foot paths
- Safety of pedestrians and traffic in the area is likely to be affected due to the progress of construction activities
- Safety of labour working in the construction sites as well as working with construction equipments as hot mix plants, batching plants, cranes etc., especially in cities where extensive construction works are being undertaken as in Ajmer, Hyderabad, Jalandhar, Pune, Pimpri – Chinchwad, Naya Raipur and Thiruvananthapuram.
- Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
- Construction activities elevate the air pollution and noise pollution in the project area temporarily. Air pollution is due to generation of noxious gases emanating from asphalt plants, construction equipment, crushers etc., while noise pollution is due to operation of various types of construction equipment
- Stacking of construction waste causing interruption to traffic and pedestrian movements
- Runoff from staked construction waste entering the water bodies and existing drainage systems causing clogging of drain outlets as well as the drains themselves

Project interventions as procurement of low emission vehicle fleets, traffic signal prioritization, ITS, provision of signage etc., involve minimal construction activities and hence, environmental and social benefits from these activities will outweigh any minimal impacts that may occur.

5.6 OPERATION IMPACTS

These are the Impacts associated with the operation and maintenance of the infrastructure built in the project. The project interventions are conceived to provide maximum benefits to the community with the implementation of the project. The project interventions as could be judged from the discussion so far involve environmental and resettlement impacts during pre-construction and construction stages of the project and appropriate mitigation and management measures would be undertaken to avoid the same.

Negative environmental / social impacts in the operation stage would mostly be limited to air and noise pollution along the improved road infrastructure as well as the parking areas. While there would be loss of usual transport routes for provision of pedestrian routes or NMT, overall improvement in environmental quality is anticipated in the operation stage. With the no project scenario, mix of NMT and motorised traffic would emit greater emissions due to higher number of start and stop cycles as well as higher idling of engines. Project interventions are anticipated to reduce the negative impacts while enhancing positive environmental impacts.

While in previously polluted and congested core city areas / heritage areas would be experiencing better environmental quality than before the project implementation due to pedestrianisation and encouraging NMT. Pedestrian safety would also be improved with the implementation of the project. Implementation of ITS and traffic signal prioritization interventions would also aid in better management of traffic leading to improvements in air and noise quality.

Chapter 6. Environment and Social Management Measures

6.1 ENVIRONMENTAL MANAGEMENT

Environmental and social impacts identified through screening and impact analysis are to be mitigated and / managed to reduce their impacts. Generic management measures applicable to the impacts discussed in the preceding section are presented in the sections below. The Environmental Management Framework for implementation of the management measures discussed below indicating the timing and applicability for various sub-project components and for the cities where applicable is indicated in the **Annex - 6**. This framework institutionalizes the measures discussed below through assigning implementation responsibilities and contractualises the measures through formulation of contract clauses for incorporation into contract documents.

6.1.1. Location

As discussed earlier section on impact analysis, location impacts on environment and resettlement or livelihood are associated with site selection. The impacts generated out of project site selection in a sensitive environmental area due to its location being unavoidable are to be mitigated.

- Location impacts arise during construction and operation stages and hence mitigation measures to avoid the impacts are to be undertaken during the appropriate stage of the project. If construction of public facilities as footpaths, parking lots, bus terminals etc., are undertaken near water bodies or parks in the urban area, measures to prevent construction debris from entering them is to be undertaken in the construction stage.
- A rigorous analysis of alternative locations for the project interventions has to be undertaken to arrive at environmentally and socially best fit locations. The facilities as bus terminals, parking terminals should be located on government lands as far as possible to avoid private land acquisition.
- In case of operation stage, runoff from the parking lots / bus terminals shall be avoided from entering the water body through appropriate drainage and disposal methods. In case parking lot / bus terminals are located nearer to a park, care shall be taken that noise generated shall not disturb the peaceful environment that needs to be maintained in the park. Adequate green belt or noise screens are to be installed to avoid noise from entering the parks.
- Acquisition of land from sensitive environmental areas shall be avoided to the extent possible and minimised in case it is unavoidable. Measures to mitigate impacts arising from such acquisition shall be undertaken early in the project cycle. In case of acquisition of forest land, measures to safeguard the precincts shall be borne by the project promoter in both construction and operation stage of the project. The Net Asset Value of forest land shall be paid to the Forest Department towards developing equivalent area of land into forest land.
- Acquisition of land from lakes and other water bodies, if unavoidable, shall be compensated with alternate water body of equivalent area at the nearest location to the affected water body.

Project interventions as ITS application and improvement of public transport network would bring in positive impacts on environment and hence, no mitigation / management measures were devised. However, if these activities require site clearance and construction activities, then

generic construction management measures would be applied to offset negative environment and social impacts.

6.1.2. Construction

Environmental management measures for impacts resulting from pre-construction and construction activities including site clearance, earthworks, civil works, etc are presented in this section. Project interventions involving construction activities include site clearance prior to initiation of construction activities. Some of the project interventions that induce such impacts are construction / reconstruction of footpaths, construction of bus terminals, bus stops, parking terminals and bus lanes etc. The environmental management measures for impacts associated with the activities are as below.

Trees need to be retained in the project area as long as they do not present a safety hazard. If trees are to be removed from the Corridor of Impact and / or construction sites, it would be done before commencement of Construction with prior intimation to the Forest Department. Necessary afforestation measures would be taken up as per the Forest Act. The trees cut will be disposed off through auction (inclusive of tree stumps). This disposal will be done immediately to ensure that the traffic movement is not disrupted.

Construction equipment and machinery as crushers, hot-mix plants & batching plants would be located away from sensitive environmental areas and from town / city precincts to avoid air and noise impacts. Specifications of the machinery need to comply with the requirements of the relevant current emission control legislations. In case of other construction vehicles, equipment and machinery, the discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to and shall conform to the relevant Bureau of Indian Standard (BIS) norms. Noise limits for construction equipments to be procured such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one metre from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.

Debris generated due to the dismantling existing facilities shall be suitably reused in the proposed construction. Unutilized debris material shall be disposed off at pre-designated disposal locations. Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.

Detailed Traffic Control Plans need to be prepared prior to commencement of works. The traffic control plans shall contain details of temporary diversions, details of arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for transport of hazardous material and arrangement of flagmen. Special consideration will be given to the preparation of the traffic control plan for safety of pedestrians and workers at night. It needs to be ensured that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.

All vehicles delivering materials to the site will be covered to avoid spillage of materials. All existing roads used by construction vehicles need to be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles. The unloading of materials in town areas will be restricted to daytime only.

All workers employed on mixing asphaltic material, cement, concrete etc., will be provided with protective footwear and goggles. Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. The use of any herbicide or other toxic chemical will be strictly in accordance with the manufacturer's instructions. A register of all herbicides and other toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor. The register will include the trade name, physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product. No man below the age of 14 years and no woman will be employed on the work of painting with products containing lead in any form. No paint containing lead or lead products will be used except in the form of paste or readymade paint. Face masks will be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped (**Annex – 12** provides the guidelines for Occupational Safety and Health).

Spillage of oil, bitumen or other chemicals needs to be remedied immediately as an emergency in case of occurrence. An Emergency Preparedness Plan while working in urban areas needs to be prepared to implement necessary measures to overcome the impacts in the event of an emergency. Personnel working on site need to be adequately trained to implement such measures proposed.

6.1.3. Operation

Major impacts envisaged in the operation stage are mostly the air and noise pollution due to increase of vehicular traffic over the project period. Environmental monitoring is to be conducted in the operation stage to keep track of the pollution levels in the project area. If they are found to exceed the prescribed standards, it is necessary to introduce measures to reduce the pollution levels through air quality management measures. These measures usually being at the policy level, should involve the city administration. The measures include:

- utilization of clean fuel in the public transport
- in case of excessive congestion and air pollution, avoidance of vehicular traffic either completely or in specific times of the day or specific days of a week.
- Planting of pollution absorbing species where space is available will be identified in the DPRs and appropriately budgeted in the DPR
- Locations for installation of noise screens in case of excessive noise pollution have to be identified during the DPR stage so as to reduce the noise during operation stage. These need to be appropriately budgeted in the DPR and phased for implementation

While in previously polluted and congested core city areas / heritage areas would be experiencing better environmental quality than before the project implementation due to pedestrianisation and encouraging NMT. Pedestrian safety would also be improved with the implementation of the project. Implementation of ITS and traffic signal prioritization interventions would also aid in better management of traffic leading to improvements in air and noise quality. Pedestrianisation of certain precincts to protect from air and noise pollution or shifting to NMT is also another option.

6.2 INVOLUNTARY RESETTLEMENT

Location of facilities has to be planned so as to have least impact on the community. If a particular location is suitable for all factors except for limited resettlement, necessary

compensatory measures as per the resettlement framework needs to be worked out. Resettlement impacts due to these interventions would be managed through appropriate compensation and rehabilitation measures as per the entitlements of the PAP. A resettlement action plan to this effect would be prepared to address the impacts. Compensation and rehabilitation measures will be carried out in accordance with the entitlement framework for the project.

It needs to be ensured that all R&R activities are to be completed before the construction activity starts, on any sub-section of project roads. If any resettlement is required for project interventions, resettlement sites required are to be taken up for construction prior to the contractor mobilization at site. Suitable locations for resettlement sites are to be identified in consultation with the PAPs to be relocated.

The participating states have experience of implementing World Bank projects under different initiatives but a Resettlement policy is already in place along with an Entitlement Matrix. The entitlement matrix needs to be adapted to the project initiatives to arrive at appropriate entitlements for identified impacts. These entitlements should have special privilege to vulnerable people affected by the project. As major resettlement impacts in the GEF-SUTP would mostly be on encroachers and squatters, they need to be rehabilitated at appropriate location and provided with training for livelihood support.

6.2.1. Entitlement Framework

Table 6-1 presents the Entitlement framework for the proposed project. State level variations wherever, have been given as footnotes. Impacts on vulnerable groups, non-titleholders and shifting business that are common in urban areas have also been addressed as part of the proposed entitlement framework.

Table 6-1: Entitlement Framework- GEF

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
A. Title Holders					
1A	Private Property	Land and assets (non-agricultural)	Household	Compensation at "replacement cost" or "actual market value".	**Compensation** • Cash compensation for the land and structure at replacement cost shall be given to the titleholder as decided by the Competent Authority[5]. • If the replacement cost is more than the compensation (at "market price" as determined by the land acquisition authority), then the difference is to be paid by the project in the form of "assistance". • Stamp duty and other fees payable for registration shall be borne by the project. • Assistance • Each AF shall get financial

[5] The concerned authorities for states include; a) Gujarat- District Land Price Committee, b) Punjab- CSR, c) Andhra Pradesh- Circle Rates prevailing in District.

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
					assistance as transportation cost for shifting of building materials, belongings etc. • For partially affected structures, compensation at replacement cost for loss of affected area shall be provided. EPs whose structures are partially affected shall be eligible for assistance for repairing/ strengthening cost of remaining structure. The repairing cost for the partially affected portion will be 25% of the replacement value of affected area as estimated per latest CSR of PWD. • A 2 months notice shall be given for the removal of structures. • The owner/tenant (in cases where a tenant occupies the structure) shall be given the right to salvage material from the structure.
1B	Private Property	Agricultural Land and Assets	Household	Compensation at "replacement cost" or "actual market value".	**Compensation** • The compensation for the land shall be given to the titleholder as decided by the as decided by the Competent Authority. If the value is not updated/less than the prevailing market value (for the year of payment of compensation), they it should be increased by the prevailing inflation rate for each year upto the year of acquisition. For delayed payments, an additional 9% per annum as interest shall be paid. • If the replacement cost is more than the compensation (at "market price" as determined by the land acquisition authority), then the difference is to be paid by the project in the form of "assistance". • In case of partial acquisition of land or severance of agricultural, If the residual plot (s) is (are) not viable (i.e, less than 0.4 ha in the case of irrigated land and less than 1 ha in case of non-irrigated land), then an additional grant of 10% of the amount paid for land acquisition shall be given. • Stamp duty and other fees payable for registration shall be borne by the concerned project. • Assistance • Each AF shall get financial assistance as transportation cost for shifting of building materials, belongings etc.

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
					• A four months advance notice shall be given to salvage crops.
2A	Livelihood	Wage earning	Individual - Titleholder	Income Restoration	• Financial assistance for loss of livelihood • Financial assistance for a period of 6 months will be given to the PAPs losing livelihood. This will be calculated based on the average wage rates prevailing in the state. • If affected person is an agricultural labourer (not applicable if the labourer is a family member) he/she shall get a monthly subsistence allowance equivalent to 20 days minimum agricultural wages per month for a period of one year. • One family member (male/female) of the affected family shall be provided necessary training facilities for development of entrepreneurship skills to take up self-employment projects as part of R&R benefits.
2B		Non-perennial crops	Household	Notice to harvest standing crops. Compensation and Assistance.	• They are entitled to be given a notice four months in advance. • Grant towards crop lost before harvest due to forced relocation, equal to market value of crop lost plus cost of replacement of seeds for the next season's harvest.
2C		Perennial crops such as fruit trees	Household	Compensation at "market value"	• Market value will be calculated as equal to the capitalized value. • Capitalised value is the net present value of production of such crops, at a discount rate of 9% per annum.
B. Non-Titleholders					
3A	Non-Titleholders	Encroachers	Household		• Will receive no compensation for land but assistance for shifting assets to the vulnerable groups (SC, ST, Women Headed Households and poor). Such assistance shall be given only to residential and commercial properties; • Encroachers will be notified a time in which to remove their assets; • Right to salvage materials from the demolished structure.
		Squatters	Household	Assistance/Rehabilitation	**Assistance** • Assistance for housing with rental assistance as prevailing in the state for a maximum of 3 months.
4A	Additional support to vulnerable	Housing	Household	Assistance	• Additional assistance for vulnerable groups has been provided as part of the entitlement

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
	groups.				framework.
5A	Shifting business	Mobile and ambulatory vendors	Household	Not eligible for compensation or assistance	Ambulatory vendors licensed for fixed locations will be considered as kiosks.
5B		Kiosks	Household	Assistance	• The assistance will be paid as a flat sum for three months • Where numerous vendors (50 or above) are displaced, provision of a "vendor's market", rent free for first six months, thereafter they would be collectively encouraged to purchase their market site would be explored.
C. Others					
6A	Community infrastructure, cohesion and amenities	Common property resources	Community	Conservation, protection, compensatory replacement	• The common property resources and the community infrastructure shall be relocated in consultation with the community
6B		Host Communities	Community	Enhancement of community resources, replacement of likely to be depleted resources	• Compensation/assistance will be provided in the form of provision of community, recreational, infrastructure facilities, and help in organizing income generating schemes, in consultation with the host community.
7	Disruption	Temporary construction related impacts	Household	Assistance may be considered in special cases.	• Access to be maintained and when disruption occurs, losses can be substantiated, "assistance" will be considered for business losses and crop/seed losses on a case to case basis.
8	Any other impact not yet identified, whether loss of asset or livelihood			Mitigation	• Unforeseen impacts shall be documented and mitigated based on the principles agreed upon in this policy framework.

6.3 CULTURAL PROPERTY RESOURCES

All utilities and common property resources likely to be affected due to the project will be relocated with prior approval of the concerned agencies before start of construction. Similarly, cultural properties within the Corridor of Impact (CoI)[6] whose structure is likely to get affected, will be relocated at suitable locations, as desired by the community before construction starts. Local community need to be contacted and discuss relocation aspects, siting as well as their maintenance.

All necessary and adequate care shall be taken to minimize impact on cultural properties (which includes cultural sites and remains, places of worship including temples, mosques, churches and shrines, etc., graveyards, monuments and any other important structures as identified during

[6] The distance from the project interventions within which the properties are likely to experience direct impacts.

design and all properties/sites/remains notified under the Ancient Sites and Remains Act). No work shall spill over to these properties, premises and precincts.

There is a likelihood of chance find of archaeological and cultural properties during excavation works especially in cities that involve extensive construction works as in case of Ajmer, Hyderabad, Jalandhar, Pune, Pimpri-chinchwad and Naya Raipur. In case of chance find it is necessary to suspend work at the site and intimate the State Archaeological Department at the earliest for necessary action. Alternative locations for undertaking the project works should be identified unless the State Archaeological Department gives clearance for resuming project works at the site.

6.4 INDIGENOUS PEOPLES

“Indigenous Peoples” as defined for the purposes of the OP 4.10, are members of distinct indigenous cultural group, collective attachment to geographically distinct habitats or ancestral territories, customary cultural, economic, social or political institutions that are separate from those of dominant society and culture and have an indigenous language different from the official language of the country or the region. Under Article 342 of the Indian Constitution, the following characteristics define indigenous peoples [Scheduled Tribes (STs)], (i) tribes’ primitive traits; (ii) distinctive culture; (iii) shyness with the public at large; (iv) geographical isolation; and (v) social and economic backwardness before notifying them as an ST. IPs have a social and cultural identity distinct from the ‘mainstream’ society that makes them vulnerable to being overlooked or marginalized in the development processes.

All sub-projects are being implemented in the urban areas which consist of SC / ST population. However, these population groups have got absorbed into the mainstream population and do not have distinct practices and customs that qualify them to be classified as indigenous population. Hence, no specific management measures as IPDP is required. However impacts on these groups would be addressed through the entitlement framework specified for the project inline with the ESMF requirements.

Chapter 7. ESMF Implementation and Management

7.1 PROCESS DESCRIPTION

The project cycle for ESMF implementation and management comprises of the following stages as:

- Project Identification
- Project Screening & Prioritisation
- Project Preparation and
- Project Implementation & Monitoring

Sub-projects under each of the project priority areas have been identified by the respective project cities for funding under the GEF. Project outlines provided by the project implementing agencies necessarily includes a brief of the environmental and social implications likely. The first three stages of the project cycle as the project identification, screening and project preparation will be undertaken by the Project Implementation Unit (PIU) assisted by the Project Management Consultants (PMC) established for undertaking SUTP. While the project implementation will be undertaken by the PIU, PMC and Contractors who would be hired for construction works under the supervision of PIU or its PMC as the case may be.

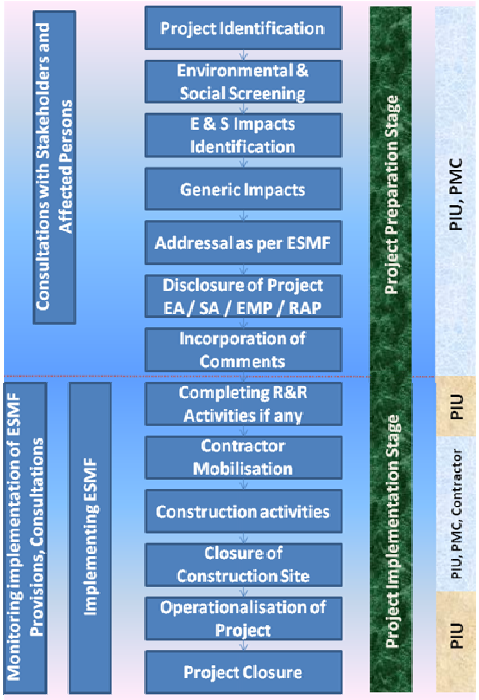


Figure 7-1: Process Map for Ahmedabad, Indore and Mysore Sub-projects

The sub-projects proposed needs to be screened as part of the project screening and prioritisation stage of the project. Environmental and social aspects that are vital for consideration of as part of the screening of sub-projects include presence of Natural Habitats, Cultural properties, other environmentally sensitive areas, contribution to greenhouse gas emissions, involuntary land acquisition, vulnerable PAP, impact on titleholders & non-titleholders.

Screening so carried out provides an overview of sub-projects that are likely to involve impacts and those that have no / minimal impacts, thus providing inputs into phasing of the sub-projects. The sub-projects that have minimal or no impacts may thus be considered in Phase I of the project as documentation and clearance requirements can be fulfilled with the project preparation duration for Phase I, while the sub-projects that require more rigorous environmental or social assessments could be placed under Phase II as these documents need time for preparation[7]. The cities that

[7] However, based on the readiness of the documents for any of the project cities, phasing will be decided. As in case of Hyderabad, Naya Raipur, Pune and Pimpri Chinchwad, completion of preparation of project documents would enable their consideration under Phase I of GEF-SUTP.

require minimal environmental and social documentation based on the envisaged subprojects are Ahmedabad, Indore and Mysore. The process map for implementation of the ESMF provisions in these cities throughout the project cycle is presented in **Figure 7-1**.

The documentation requirements for EA/EMP and SA/RAP need to be integrated into the Detailed Project Reports for further project processing. At the stage of detailed project preparation, any significant environmental and social issues that may arise need to be addressed and mitigated through an EMP / RAP. The cities that require detailed EA / SA are identified to be Ajmer, Hyderabad, Jalandhar, Pune, Pimpri-Chinchwad, Naya Raipur and Thiruvananthapuram. A process map of implementation of the Environmental and social provisions throughout the project cycle is presented in the **Figure 7-2**.

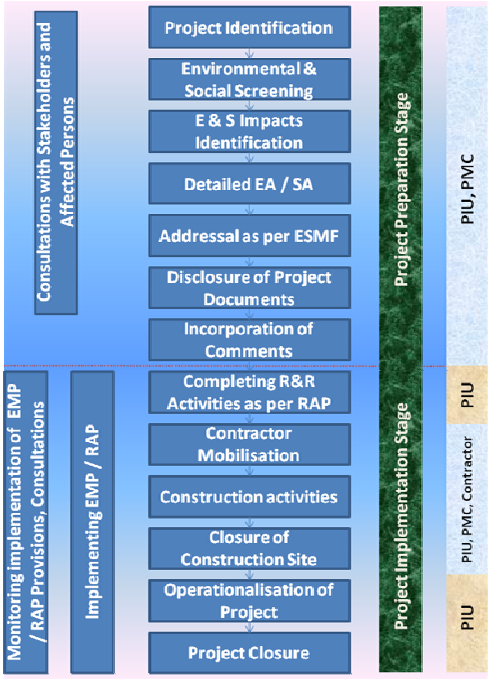


Figure 7-2: Process Map for Ajmer, Hyderabad, Jalandhar, Pune, Pimpri – Chinchwad, Naya Raipur and Thiruvananthapuram

The environmental management measures through the EMP should be included as part of the specifications and codified in the bidding documents to ensure implementation. These documents need to be prepared by the DPR consultant in accordance with the typical ToR presented in **Annex - 8** and **Annex – 9** for Environmental Assessment and Social Assessment. Draft form of RAP is provided in the **Annex – 10.**

RAP should be implemented by the implementation agency either by building the capacity of its implementation in house in case of minor impacts or by engaging a third party who has experience in implementation of the RAP prior to start of civil works. Progress of implementation activities for both these provisions is to be monitored through a monitoring plan providing the monitoring indicators and implementation schedule. Necessary budgetary provisions for all these measures need to be included as part of the DPR. Inclusion of these provisions and any other specific measures that may be required shall be assessed based on a generic checklist of items required to be included into DPR for environmental and social aspects. The DPRs for respective sub-projects would be checked for inclusion of these provisions and finalised.

In case of presence of R&R impacts in the project, it will be ensured that Affected Persons are compensated, resettled and / or rehabilitated as per the provisions of the project entitlement framework prior to initiation of civil works. This shall be ensured by the PIU environmental and social officer and certified for start of civil works.

Implementation arrangements are discussed in detailed in the paragraphs below. A training plan is also devised to ensure the environment and social officer of the PMU and the PIU would be able to follow up the implementation of these documents.

The monitoring plan so prepared in the DPR stage needs to be ensured that it caters to all stages of project implementation. As in the operation / implementation stage of the project,

performance indicators are to be monitored to provide inputs for assessing the extent of expected outcomes achieved.

7.2 INSTITUTIONAL ARRANGEMENTS

A three-tier management structure is envisaged to enable effective communication and distribution of responsibilities between the three primary stakeholders namely the GoI, State Government and the Implementing Agency. The SUTP is to be implemented and monitored by the steering committee and the MoUD, GoI by a Project Management Unit (PMU). The project management structure has been envisaged to enable effective communication and distribution of responsibilities amongst different participants of the SUTP at all the different levels and has been discussed in detail in the Operations Manual prepared for the project. The PMU will involve Environmental Safeguard Expert and Social Safeguard Expert to guide the PIU setup by the Implementing Agencies in the respective project cities. The PIU will also have an Environment and Social Officer nominated to address the environmental and social issues arising in the project design and implementation as per the ESMF and Project EA/SA. Constitution of the PIU in project cities is presented in the **Annex – 11**. Roles and responsibilities of the respective environment and social officers in the PMU and PIU are discussed in detail in the sections below.

A PMC shall be selected and appointed by the NPD, PMU for the project term. The terms of reference (TOR) for the PMC are also provided in the project document. The project management consultants would necessarily involve in their team an environment and resettlement / social officer to design, recommend and implement environment and resettlement activities as per the regulations of the World Bank, GEF and Government of India.

Environmental & Social Experts of PMU: Two members of the PMU will be designated as Environmental Safeguard Expert & Social Safeguard Expert to oversee the implementation of ESMF as well as any other environmental and social provisions as deemed fit for project implementation as per the regulations of the World Bank and Government of India. The Terms of Reference for Environmental and Social Officers to be appointed shall be as indicated in the Boxes below.

PMU'S ENVIRONMENTAL SAFEGUARD EXPERT

The Environmental Safeguard Expert should have a Masters degree or equivalent in Environmental Science, Engineering, Applied Sciences or another relevant field and should be conversant with the GoI and World Bank policies on the subject. A minimum of 5 years of professional experience and experience in implementing atleast one World Bank funded project during the last five years will be necessary. Following are the roles and responsibilities of the expert.

Roles & Responsibilities

- Co-ordinate application, follow up processing and obtain requisite Environmental Clearances required for the project, if required
- Advise PIU for compliance with statutory requirements.
- Develop, organize and deliver training programme for the PIU staff, the contractors and others involved in the project implementation, in collaboration with the Project Director / Environmental Expert of the PIU where exists
- Liaise with various Central Government agencies on environmental and other regulatory matters
- Review environmental performance of the project, Compile periodically environmental monitoring reports submitted by the PIU and provide a summary of the same to the National Project Director for necessary follow-up actions
- Provide support and assistance to the Government Agencies and the World Bank to supervise the implementation of the EMP during the construction as well as operation stages of the project
- Document the good practices in the project on incorporation and integration of environmental issues into engineering design and on implementing measures in the construction and maintenance programs of urban infrastructure projects, and dissemination of the same with the assistance of Environment & Social Officer of PIU

PMU'S SOCIAL SAFEGUARD EXPERT

The Social Safeguard Expert should have a Masters degree or equivalent in Social Science or another relevant field and should be conversant with the GoI and World Bank policies on the subject. A minimum of 5 years of professional experience and experience in implementing atleast one World Bank funded project during the last five years will be necessary. Following are the roles and responsibilities of the expert. Roles & Responsibilities

- Co-ordinate application, follow up processing and obtain requisite clearances for the project, if required
- Advise PIU for compliance with statutory requirements.
- Develop, organize and deliver training programme for the PIU staff, the contractors and others involved in the project implementation, in collaboration with the National Project Director / Environment and Social Officer t of the PIU
- Review and monitor the performance of the project through an assessment of the periodic social monitoring reports submitted by the PIU; provide a summary of the same to the National Project Director, and initiate necessary follow-up actions
- Provide support and assistance to the Government Agencies and the World Bank to supervise the implementation of the RAP / LAP during the construction as well as operation stages of the project
- Document the good practices in the project on incorporation and integration of social and resettlement issues into engineering design and on implementing measures in the construction and maintenance programs of urban infrastructure projects, and dissemination of the same with assistance of Environment & Social Officer of PIU

Environmental & Social Officer of PIU: Project Implementation Unit setup for assisting the implementation agency would require an Environment and Social Officer to assist the Environment and Social Safeguard Experts at the Project Management Unit especially for project cities that have potential issues. Interventions in Phase I cities - Hyderabad, Pune and Pimpri - Chinchwad would require an Environmental and social officer at the PIU. The Environmental & Social Officer shall oversee the implementation of ESMF as well as any other environmental and social provisions as deemed fit for project implementation as per the regulations of the World Bank and Government of India. The Terms of Reference for Environmental and Social Officer shall be as indicated in the Box below.

PIU'S ENVIRONMENTAL & SOCIAL OFFICER

The Implementing Agency shall nominate one officer with relevant experience in infrastructure projects as Environmental and Social Officer to undertake the following responsibilities.

Roles & Responsibilities

- Review the EA / SA Documents prepared by the consultants and ensure adequacy under the World Bank Safeguard policies including the OP4.01.
- Ensure that the project design and specifications adequately reflect the recommendations of the EIA / SIA
- Co-ordinate application, follow up processing and obtain requisite clearances required for the project, if required
- Prepare compliance reports with statutory requirements.
- Develop, organize and deliver training programme for the PIU staff, the contractors and others involved in the project implementation, in collaboration with the PMU
- Review and approve the Contractor's Implementation Plan for the environmental measures, as per the EIA and any other supplementary environmental studies that may need to be carried out by the PIU
- Liaise with the Contractors and the PIU / State Implementing agency on implementation of the EMP / RAP
- Liaise with various State Government agencies on environmental, resettlement and other regulatory matters
- Continuously interact with the NGOs and Community groups that would be involved in the project
- Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project
- Review the performance of the project through an assessment of the periodic environmental monitoring reports submitted by the PMC; provide a summary of the same to the Project Director, and initiate necessary follow-up actions
- Provide support and assistance to the Government Agencies and the World Bank to supervise the implementation of the EMP / RAP during the construction as well as operation stages of the project

In rest of the cities where potential impacts are not significant, an Engineer of the PIU shall be given an additional charge of overseeing the implementation of ESMF.

7.3 PARTICIPATION / CONSULTATION FRAMEWORK AND INFORMATION DISCLOSURE

7.3.1. Participation / Consultation Framework

The Participation Framework envisages involvement of all the stakeholders' at each stage of project planning and implementation. The PIU / state level nodal agency will be responsible for ensuring participation of the community at sub-project level. Involvement of the community is not limited to interactions with the community but also disclosing relevant information pertaining to the project tasks. Community participation shall be undertaken at the following stages:

- Prioritization Stage - to sensitize the community about the project and their role;
- Planning Stage - for disseminating information pertaining to the project, work schedule and the procedures involved; finalisation of project components with identification of impacts, entitled persons, mitigation measures; and Grievance Redressal; and
- Implementation Stage - for addressing temporary impacts during construction and monitoring for transparency in the project implementation

7.3.1.1. Prioritisation Stage

Dissemination of project information to the community and relevant stakeholders is to be carried out by the PIU at this stage of the project initiative. The community at large shall be made aware of the project alternatives and necessary feedback is to be obtained. This should include the process being followed for prioritisation of the identified sub-projects. Community and other stakeholders should be involved in the decision making to the extent possible. Information generated at this stage should be documented for addressal of queries arising out of the Right to Information Act, 2005.

7.3.1.2. Project Planning Stage

Sub-project information is to be distributed amongst the community towards increasing their awareness and their roles and responsibilities. Planning stage is intended to be an interactive process with the community atleast in two stages. Initially while finalizing the best fit alternative to a sub-project and second at the finalisation of the detailed designs. This would be joint responsibility of the consultants undertaking the design if not carried out by the PIU in house and the PIU itself.

Consultations with Project Affected Persons and their profiling are mandatory as per the requirements of preparing a RAP. This needs to be done as socio-economic and census surveys as part of the detailed designs. Consultations with respect to environmental and cultural aspects are to be carried out as part of the Environmental Impact Assessments / Preliminary Impact Analysis studies for all alternatives and the selected alternative sub-project option.

7.3.1.3. Implementation Stage

Consultations as part of the implementation stage would be direct interactions of the implementation agency with the Project Affected Persons. These would comprise of consultations towards relocation of the PAPs, relocation of cultural properties, and towards addressal of impacts on environmental resources as water bodies, trees etc.

With the implementation of the EMP and R&R provisions in progress, consultations and information dissemination is to be undertaken to let the affected persons informed of the progress.

Implementation stage also involves redressal of grievances in case of R&R aspects as well as relocation of common property resources through the grievance redressal mechanisms. These would usually be one to one meeting of PAP or community representatives with the grievance redressal committees established for the project.

7.3.2. Information Disclosure

The mechanism of information dissemination should be simple and be accessible to all. Two of the important means that have been followed until now include briefing material and organization of community consultation sessions. The briefing material (all to be prepared in local language) can be in the form of a) brochures (including project information, land acquisition and details of entitlements including compensation and assistance to be given to the PAPs) that can be kept in the municipal office; b) posters to be displayed at prominent locations and c) leaflets that can be distributed throughout the length of the project corridors. Consultation meetings should also be organized at regular intervals by the PIU to acquaint the PAPs of the following:

- Timeline and progress of the project;
- Information on compensation and entitlements;
- Information on land acquisition and market valuations of property;
- Time line for acquisition.

Also, opinion and consensus of the community needs to be sought for common and cultural property relocation. Information disclosure procedures are mandated to provide citizen centric information as well as all documentation necessary for addressing any queries under Right to Information Act that came into effect from October 2005. A computer based information management systems shall be employed to disseminate information pertaining to the project on the MoUD and various IA's website. Disclosure of information will enhance governance and accountability specifically with respect to strengthening of monitoring indicators to help MoUD and the World Bank monitor compliance with the agreements and assess impact on outcomes.

This Information Disclosure Policy is intended to ensure that information concerning the SUTP activities will be made available to the public in the absence of a compelling reason for confidentiality. Information shall be provided in a timely and regular manner to all stakeholders, affected parties, and the general public. Access by the public to information and documentation held or generated by MoUD and implementing agencies will facilitate the transparency, accountability, and legitimacy as well as operations overseen by it. As a part of its disclosure policy, all documents shall be made available to the public in accordance with relevant provisions of the RTI Act, except when otherwise warranted by legal requirements. A designated Information Officer shall be responsible for ensuring timely and complete dissemination in accordance with this policy.

7.3.2.1. Information to be disclosed

The **Table 7-1** specifies the type of additional information and frequency of dissemination for projects which are financed either from domestic or donors' funds. In addition to the information

specified in the table, the following information shall also be displayed / disseminated, wherever applicable.

- Project specific information need to be made available at each contract site through public information kiosk
- Project Information brochures shall be made available at all the construction sites as well as the office of implementation agency and the office of Engineer in charge.
- Reports and publications, as deemed fit, shall be expressly prepared for public dissemination e.g., English versions of the EA, EMP, SA, RAP, Executive Summary of project documents, Executive summary of the project documents in local language etc.,

Table 7-1: Information to be Disclosed

Topic	Documents to be disclosed	Frequency	Suggested Media(s)
Resettlement, Rehabilitation and Land Acquisition	Resettlement Action Plan (RAP)	Once in the entire project cycle. But to remain on the website and other disclosure locations throughout the project period.	World Bank's Infoshop MoUD / Implementation Agency's website. Deputy Commissioner's Office State and District Libraries Offices of Project Management Unit & Project Implementation Units (PIU)
	Resettlement & Rehabilitation Policy translated in Hindi / local language	Once in the entire project cycle.	Distributed among Project Affected Persons (PAP)
	Information regarding impacts and their entitlements	Once at the start of the project and as and when demanded by the PAP.	Through one-to-one contact with PAPs. Community consultation List of PAPs with impacts and entitlements to be pasted in the ULB office and website of MoUD / Implementing Agencies
	R&R and LA monthly progress report.	10th day of every month	MoUD / Implementation agency's website. Offices of Project Management Unit & Project Implementation Units (PIU)
	RAP Impact Assessment Report	After substantial completion of each phase	MoUD / Implementation agency's website.
	Land Acquisition notifications	As required under the LA Act	MoUD / Implementation agency's website.
	Grievance redressal process.	Continuous process throughout the project cycle.	World Bank's Infoshop. MoUD / Implementation agency's website. Deputy Commissioner's Office State and District Libraries Offices of Project Management Unit & Project Implementation Units (PIU) One to one contact with PAPs.
Public Consultation	Minutes of Formal Public Consultation Meetings	Within two weeks of meeting	MoUD / Implementation agency's website. Deputy Commissioner's Office State and District Libraries Offices of Project Management Unit & Project Implementation Units (PIU)

Topic	Documents to be disclosed	Frequency	Suggested Media(s)
Environment Management	Environment Assessment Report along with Hindi/local language translation of Executive Summary & Environment Management Plans along with Hindi/local language translation of Key Actions	Prior to awarding works and to remain on website until end of Defect Liability Period	MoUD / Implementation agency's website. Deputy Commissioner's Office State and District Libraries Offices of Project Management Unit & Project Implementation Units (PIU)

7.3.3. City Level Consultations and Disclosure

The Participation / consultation framework and information disclosure prepared for GEF-SUTP is applicable for all cities considered under the project. In case of project cities where detailed EA and SA are not required, the provisions of ESMF integrated into the project DPR will be disclosed. This is incase of cities as Ahmedabad, Indore and Mysore. While in rest of the cities, the provisions of EA and SA will be disclosed as per the framework. Presently Draft ESMF prepared for GEF-SUTP is being disclosed by the IA on their respective websites and consultations are conducted with NGO and other stakeholders.

7.4 MONITORING AND REPORTING

Implementing agency in each of the states where there is a single project and the corresponding agency for each project in case of multiple projects will be responsible for monitoring and reporting at project level to the state level implementing agency or the Project Implementation Unit. The PIU would in turn report to the Project Management Unit at the centre.

An officer in PIU shall be designated as the Environment & Social Safeguards officer to ensure compliance of the project activities with the World Bank safeguards as well as oversee implementation of environment and social provisions as per the ESMF, EMP and RAP where applicable.

The objectives of Monitoring and Evaluation include:

- Project management and timely completion;
- Successful completion of Environmental management, R&R activities identified in the EMP and R&R plan as per the implementation schedule;
- Compliance with the Environmental policy, R&R policy and entitlement framework.

The safeguards officer shall play a key role in reporting the progress of implementation as well as compliance to the PIU, PMU and the World Bank. Reporting system recommended in the **Annex - 10** shall be adopted with due modifications specific to the project. The reports to be given are detailed in **Table 7-2** for R&R activities and **Table 7-3** for environmental management.

Table 7-2: Mechanism for Monitoring of R&R activities

S.No.	Format No.	Format Name	Frequency of Reporting	Responsible Agency	Monitoring Agency
1	1	Verification of land to be Acquired	One time	Environment and Social Officer, PIU	PMC under the PIU
2	2	Status of Land Acquisition	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
3	3	Progress on Census Survey	Quarterly	Environment and Social Officer, PIU	PMC under the PIU

S.No.	Format No.	Format Name	Frequency of Reporting	Responsible Agency	Monitoring Agency
4	4	Progress on Socio-Economic Survey	Quarterly	Environment and Social Officer, PIU	PMC under the PIU
5	5	Verification of PDFs	Quarterly	Environment and Social Officer, PIU	PMC under the PIU
6	6	Verification of Squatters	One time	Environment and Social Officer, PIU	PMC under the PIU
7	7	Verification of Encroachers	One time	Environment and Social Officer, PIU	PMC under the PIU
8	8	Distribution of Entitlements and Assistances	To be synchronised with Civil Works	Environment and Social Officer, PIU	PMC under the PIU
9	9	Progress of Relocation of CPRs	–do-	Environment and Social Officer, PIU	PMC under the PIU
10	10	Progress of Relocation of Cultural Property	–do-	Environment and Social Officer, PIU	PMC under the PIU
11	11	Progress of Relocation and Site Clearance	–do-	Environment and Social Officer, PIU	PMC under the PIU
12	12	Community Consultations	Quarterly	Environment and Social Officer, PIU	PMC under the PIU
13.	13.	Progress of Grievance Redressal	Quarterly	Environment and Social Officer, PIU	PMC under the PIU

Table 7-3: Mechanism for Monitoring of Environmental Management

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard	Applicability	Responsibility
1	Air Quality at Sensitive Receptors	Design, Construction and Operation stages	SPM & RPM	Along sensitive areas and peripheral residential areas	Thrice a year (once in each season except monsoons) for the entire construction period	IS: 2296	All projects excluding NMT interventions that do not require civil construction works	Contractor through Monitoring Agency
2	Noise Levels at Sensitive Receptors	Design, Construction and Operation stages	Equivalent Day & Night Time Noise Levels	Along sensitive areas and peripheral residential areas	Thrice a year (once in each season except monsoons) for the entire construction period	Noise Quality Standards, CPCB	All projects excluding NMT interventions that do not require civil construction works	Contractor through Monitoring Agency
3	Surface Water Quality Rivers in the vicinity of project areas	DPR & Construction Stage	TDS, TSS, pH, Hardness	Upstream and downstream of Material Stockyards	Twice a year (pre monsoon and post monsoon) for the entire period of construction	IS: 2296	All projects involving civil construction works	Contractor through Monitoring Agency
4	Benefits	Operation	Level of satisfaction of beneficiaries, Creditable ER	Whole Project	Annual		For all Project interventions under GEF	PIU
5	Survival Rate of Plantation	Operation Stage	Survival Rate of Proposed Afforestation / compensatory plantation	Where replantation is carried out	Twice a year till the trees reach a minimum height of 2 m	-	For all Project interventions involving tree cutting	PIU

7.5 GRIEVANCE REDRESSAL MECHANISM

Grievance redressal mechanism is an important aspect in projects involving land acquisition. The redressal of grievance is important to avoid unnecessary legal delays and cost overrun of the project. Also, this is a forum for people to express their dissatisfaction over compensation and R&R provisions.

A Rehabilitation and Resettlement Committee shall be constituted within the PIU to monitor and review the progress of implementation of the scheme or plan of rehabilitation and resettlement of the affected families and to carry out post implementation social audits wherever resettlement activities are to be undertaken. The committee shall be formed including the following members:

- Municipal Commissioner as the Chairman
- Social officer of the PIU;
- Environment and social officer in PMU;
- A representative of a voluntary organization;
- Representative/s of the affected community(or communities)

The functions of the Rehabilitation and Resettlement Committee are:

- to publicize within the District the list of affected persons and the functioning of the grievance redressal procedure established hereby;
- to evaluate grievances from affected persons concerning the application to them of the Entitlement Policy;
- to recommend to the Social Officer, PIU as the case may be, solutions to such grievances from affected persons;
- to communicate the decisions to the Claimants;
- to hear appeals from persons, households or groups who, not being affected persons, believe that they are qualified to be recognized as affected persons, to recommend to the PIU whether such persons should be recognized as affected persons, and to communicate the decision of the PIU in that regard to the Claimants;
- To ensure that all notices, forms, and other documentation required by Claimants are made available Local language.

The Grievance Redressal Mechanism devised is applicable for all the project cities considered under the GEF-SUTP. The committees are to be set up at city level with the representatives as mentioned above. In case of cities where no major environmental and social impacts as in Ahmedabad, Indore and Mysore, the PIU itself will handle the grievances if any instead of the Grievance Redressal Mechanism.

7.6 CAPACITY BUILDING AND TRAINING

The Environmental and Social Officers involved in the project need to be provided the basic training required for environmental awareness followed by specific aspects of Urban Sector Projects along with Environmental implications in the project. Specific modules customized for the available skill set would need to be devised after assessing the capabilities of the members of the Training Programme and the requirements of the project. The entire training would cover basic principles of environmental assessment and management; mitigation plans and programmes, implementation techniques, monitoring methods and tools. Specific issues of

Urban Environmental Management would need to be undertaken in separate sessions. Typical modules that would be present for the training session are:

- Sensitization of the project implementing agencies on environment and social aspects
- Introduction to Environment, Social and Resettlement Aspects
- Environment, social and resettlement Considerations in Urban Development Projects
- Review of EIA/IEE/EMP & SIA/RAP/LAP and Integration into Design
- Improved co-ordination within Nodal Departments
- Special Issues in SUTP
- Role during construction
- Monitoring & Reporting System

Target groups for training would be the environment and social officers of PMU and PIU for all the sessions and engineers / planners / managers for orientation sessions. The training sessions should be followed with site visits to have a 'hands on' approach to the program. Suggested modules for the training sessions the mode of training and duration is presented as **Annex-13**.

7.7 GHG BENEFITS OF SUTP

The Sustainable urban transport projects (SUTP) financed by the GEF, has its primary focus in reducing the traffic congestion observed normally in the urban transportation system by adopting Public transport improvement, Non Motorized Transport and Pedestrian Facilities, Integrated land use and Transport Facilities, Intelligent Transport system and City centre traffic and Environmental Improvements.

The growing energy needs, especially in urban transport present major challenges in terms of energy security and the environmental externalities associated with GHG emissions. A moderate increase in per capita vehicle ownership could lead to a long commute time, changes in land use, and more transport-related air pollution. The trend toward increased motorization, in all its forms, leads to longer travel times for surface public transport (buses) —which in turn induces more auto and taxi use — and to poor traffic safety, the economic inefficiency of increased fuel use, and degradation of the urban quality of life.

Studies show that large GHG benefits could be achieved through a shift from small and private vehicles to large-capacity vehicles for personal transportation. This modal shift is expected to avoid the GHG emissions that would have resulted from the small vehicles. A shift to public transportation is expected to reduce CO2 emissions by 9.6 percent, while emissions of particulate matter (PM10 and PM2.5) would drop by 8 percent, assuming the implementation of urban land use policies regarding housing and commercial real estate development, along with transportation planning to avoid congestion (World Bank 2003c).

The GHG reductions (benefits) thus achieved could be sold to countries with reduction commitments as per the UNFCCC. Thus these projects are the potential Clean Development Mechanism (CDM) projects to achieve Creditable Emission Reductions. The methodology to be followed for preparing projects for CDM is available for BRT networks at present. Many methodologies are under preparation for the transport projects and are standing approval of the CDM Board. The projects under GEF with the preparation of DPR should also be prepared for CDM following the approved methodologies to reduce time for approval. If approved

methodologies are not available, methodology should be evolved and presented to the CDM board for approval.

7.8 COST ESTIMATES FOR ESMF

In view of the environmental and social management measures suggested above to be implemented necessary budgetary provisions should be made in the DPRs for the individual projects. Budget for each of the project should include the environmental management costs other than the good engineering practices, cost of environmental and resettlement monitoring. Block cost estimates for fulfilling the project requirements as per ESMF indicate the cost for environmental and social management to be about INR 5.8 crores. Out of which about INR 3.25 crores is estimated to be for RAP i.e., towards assistance / compensation. Remaining is estimated towards environmental management & capacity building. It is assumed that each of the sub-projects involving civil works will involve environmental and resettlement costs. These costs do not involve administration costs of environment and social staff at PMU / PIU. Details of cost estimates are provided in **Table 7-4**.

Table 7-4: Block Cost Estimates for Environment and Social Management as per ESMF

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
Ajmer-Pushkar	Pedestrian facilities	Pushkar, Ajmer Dargah and Ajmer City	324000	300000	100000	1000000	2500000	
	Vehicle Parking facilities	Ajmer City	324000	300000	100000	2000000		
	Pedestrian subway	Ajmer City	324000	300000	100000	2500000		
	RuB	Ajmer City	324000	300000	100000	2000000		
	Pedestrian Signals and junction improvement	Ajmer City						
	Road markings and signages	Ajmer City						
	Street Lighting	Ajmer City						
	Grade Separated Pedestrian Facilities	Pushkar						
	TA for preparation of pedestrian / cycle plan							
	City Sub-Total INR		**1296000**	**1200000**	**400000**	**7500000**	**2500000**	
Ahmedabad	**Service improvements to planned BRT system**	Ahmedabad City						
	Fare integration between existing AMTS service and new BRT	Ahmedabad City						
	Automatic Fare Collection & control center for BRTS system	Ahmedabad City						
	Automatic Traffic Control System (ATC)	Ahmedabad City						
	Training for	Ahmedabad City						

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
	planning unit in BRTS organization							
	Bicycle Plan & Bicycle Rental Scheme	Ahmedabad City						
	TA for transit oriented development	Ahmedabad City						
	City Sub-Total INR		**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	
Hyderabad	Pedestrian infrastructure improvement near MMTS		324000	300000	100000	1000000	2500000	
	Footpath Improvements	Around MMTS Stations						
	Pelican Signals	Around MMTS Stations						
	Zebra Crossings & Signages	Around MMTS Stations						
	FOBs	Around MMTS Stations						
	Others	Around MMTS Stations						
	Incentivizing multi-modal travel							
	Transit oriented development study							
	Multi-modal transfer site study							
	City Sub-Total INR		**324000**	**300000**	**100000**	**1000000**	**2500000**	
Indore	Bus signal prioritization	Along BRTS Corridor						
	Automatic Fare Collection	Along BRTS Corridor						
	City Sub-Total INR		**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	
Jalandhar	Construction of Foot over Bridge	City Wide	324000	300000	100000	1000000	2500000	
	Construction of Underpass	City Wide	324000	300000	100000	2000000		
	Construction of Parking Facilities	City Wide	324000	300000	100000	1000000		
	Misc.Works (improvement of roads &junction geometry)	City Wide	324000	300000	100000	2500000		
	Sustainable Urban Transport Study							
	Development Plan							
	City Sub-Total INR		**1296000**	**1200000**	**400000**	**6500000**	**2500000**	
Mysore	ITS for City Bus services	City Wide						
	Retrofit for Bio fuel and storage depots	City Buses						
	TA for sustainable							

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
	transport plan							
	City Sub-Total INR		**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	
Naya Raipur	Additional lanes on proposed road networks for providing dedicated roads for BRTS	N-S and E-W Corridor	324000	300000	100000	1000000	2000000	
	BRT Buses	Along BRTS Corridor						
	Buses (Feeder Service -Mini Buses)	Along BRTS Corridor						
	Bus Stops / Bus Shelters	Along BRTS Corridor						
	Bus Terminals	Along BRTS Corridor						
	Bus Depots	End of BRTS Corridor	324000	300000	100000	2000000		
	GPS/PIS System	Along BRTS Corridor						
	Ticketing System	For BRTS Buses						
	Transit Oriented Development							
	City Sub-Total INR		**648000**	**600000**	**200000**	**3000000**	**2000000**	
Pune	Cycle & Footpath Tracks		324000	300000	100000	5000000	2500000	
	Cycle Stands							
	Underpasses		324000	300000	100000	2500000		
	City Sub-Total INR		**648000**	**600000**	**200000**	**7500000**	**2500000**	
Pimpri - Chinchwad	Road Infrastructure and Structures		324000	300000	100000	1000000		
	Bus Terminals		324000	300000	100000	1000000		
	ITS							
	City Sub-Total INR		1296000	1200000	400000	4000000	2500000	
Trivandrum	Chalai Pedestrian Precinct	East Port to Killipalam						
	Elevated pedestrian walkway	Central Area and Thampanoor Area	324000	300000	100000	3000000	2500000	
	Parking Area Development	Near Chalai Vegetable Market	324000	300000	100000	1000000		
	Preparation of pedestrian / cycle plan		324000	300000	100000	3000000		
	City Sub-Total INR		**972000**	**900000**	**300000**	**7000000**	**2500000**	
		Total INR	**5,184,000**	**4,800,000**	**1,600,000**	**32,500,000**	**14,500,000**	**58,584,000**

7.9 UPDATION AND REVISION OF ESMF

The ESMF would be utilized for screening of projects as well as implementation of the specified environmental and social provisions in the sub-projects of SUTP and is considered to be a 'living document' enabling revision where necessary. During the course of its preparation also the document has been thoroughly reviewed by the MoUD, the participating Implementing Agencies, The World Bank and various other stakeholders including the public. Comments issued on the draft document have been addressed appropriately in the document and accordingly finalised. The comments received and their addressal in the document is presented in the **Annex – 14**. It is imminent that certain factors that would have been overlooked or not considered due to the preparation of this document upstream in the project cycle, with minimum ground verification would crop up during project implementation. The factors that would have implications on compliance to World Bank, Government of India or respective state government environmental regulations would be addressed through updation of the ESMF.

ANNEXURES

Annex – 1

SUB-COMPONENTS IN SELECTED CITIES

City	Component	Subcomponent/Location
Ajmer-Pushkar	Pedestrian facilities	Pushkar and Ajmer City
	Vehicle Parking facilities	Ajmer City
	Pedestrian subway	Ajmer City
	ROB	Ajmer City
	Pedestrian Signals and junction improvement	Ajmer City
	Road markings and signages	Ajmer City
	Street Lighting	Ajmer City
	Grade Separated Pedestrian Facilities	Pushkar
	TA for preparation of pedestrian / cycle plan	
Ahmedabad	**Service improvements to planned BRT system**	
	Supply and Installation of ITS for GPS Control of AMTS Buses	Ahmedabad City
	Control Center Development	Ahmedabad City
	Bike Infrastructure and Bicycle Rental Scheme	Ahmedabad City
	Training for planning unit in BRTS organization, AMTS & Associated Agencies	Ahmedabad City
	Design of Bicycle Plan	
	TA for transit oriented development	
	TA for transit Integration Study	
Hyderabad	**Pedestrian infrastructure improvement near MMTS**	
	Footpath Improvements	Around MMTS Stations
	Pelican Signals	Around MMTS Stations
	Zebra Crossings & Signages	Around MMTS Stations
	FOBs	Around MMTS Stations
	Street Lightings	Around MMTS Stations
	Others	Around MMTS Stations
	Incentivizing multi-modal travel	
	Transit oriented development study	
	Multi-modal transfer site study	
Indore	Bus signal prioritization	Along BRTS Corridor
	Automatic Fare Collection	Along BRTS Corridor
Jalandhar	Construction of Foot over Bridge	City Wide
	Construction of Underpass	City Wide
	Construction of Parking Facilities	City Wide
	Misc. Works (improvement of roads &junction geometry)	City Wide
	Sustainable Urban Transport Study	
	Development Plan	
Mysore	ITS for City Bus services	City Wide
	Retrofit for Bio fuel and storage depots	City Buses
	TA for sustainable transport plan	

City	Component	Subcomponent/Location
Naya Raipur	Additional lanes on proposed road networks for providing dedicated roads for BRTS	N-S and E-W Corridor
	BRT Buses	Along BRTS Corridor
	Buses (Feeder Service -Mini Buses)	Along BRTS Corridor
	Bus Stops / Bus Shelters	Along BRTS Corridor
	Bus Terminals	Along BRTS Corridor
	Bus Depots	End of BRTS Corridor
	GPS/PIS System	Along BRTS Corridor
	Ticketing System	For BRTS Buses
	TA on ransit Oriented Development	
Pune	Cycle & Footpath Tracks	
	Cycle Stands	
	Underpasses	
Pimpri - Chinchwad	Road Infrastructure and Structures	BRTS Corridor
	ITS	For BRTS Buses
	Bus Terminals	Along BRTS Corridor
Trivandrum	Chalai Pedestrian Precinct	East Port to Killipalam
	Elevated pedestrian walkway	Central Area and Thampanoor Area
	Parking Area Development	Near Chalai Vegetable Market
	Preparation of pedestrian / cycle plan	
	TA for preparation of TIMTS	

Annex – 2

CHECKLIST OF ENVIRONMENTAL PROVISIONS IN THE DPR

(A) Environmental Concerns to be addressed while preparing DPR

Sl. No.	Activity	Items to consider	Measures to address	
1	Preliminary Project Information	Trees	(i)	Inventorisation of environmental features
		Forests	(ii)	Avoidance, design modifications to minimize adverse environmental impacts
		Drainage lines / Rivers / water crossings	(iii)	Incorporating community concerns into finalizing designs
		Water bodies		
		Cultural properties		
		Utilities		
		Community facilities		
		Major junctions		
2	Detailed Surveys	Air Quality	(i)	Establish baseline air quality of the project area
		Noise Quality	(i)	Establish baseline noise quality of the project area
		Water Quality	(i)	Establish baseline water quality of the project area
3	Identification of material sources	Borrow material	(i)	Utilizing alternative materials
			(ii)	Minimize requirements through design modifications
			(iii)	Location criteria to be applied for selection of borrow areas
		Quarry material	(i)	Use of alternative materials to be encouraged
			(ii)	Material extraction from existing quarries
		Water availability	(i)	Identification of perennial/community/private sources
			(ii)	Scheduling construction to suit water availability in case of water scarce areas
			(iii)	Utilizing community water sources without conflict of uses
4	Assessment of environmental impacts	Climatic factors	(i)	Scheduling construction considering the special weather phenomena
		Water bodies	(i)	Provision of silt fencing
			(ii)	Rehabilitation of water bodies
		Land use changes	(i)	Land use control measures adjacent to the road
			(ii)	Development regulations to avoid unplanned developments induced by implementation of the project interventions
		Cultural properties	(i)	Avoidance through design modifications
			(ii)	Planning for Relocation & rehabilitation
		Common Property Resources	(i)	Avoidance through design modification
			(ii)	Planning for Relocation of consultation with community
		Drainage	(i)	Provision of adequate number of CD Structures
		Trees	(ii)	Compensatory plantation
		Forest areas	(i)	Avoidance through design modifications
			(ii)	Environment Management measures during construction

Sl. No.	Activity	Items to consider	Measures to address	
		Natural Habitats	(iii)	Avoidance through design modification or formulating additional measures for avoiding impacts
5		Construction sites	(i)	Provision of pollution control measures
			(ii)	All measures to ensure public & worker's health/safety
			(iii)	Water Management
		Construction camps	(i)	Criteria for identification of sites and Infrastructure arrangements
			(ii)	Safe disposal of all wastes
			(iii)	Enforcement of pollution control measures
		Borrow areas	(i)	Arrangements with land owners to include redevelopment
		Quarry areas	(ii)	Rehabilitation of quarry areas if new quarries are opened
		Public/workers health & safety	(i)	Personal Protective Equipment to be provided
			(ii)	Public safety at construction sites to be undertaken
			(iii)	Measures for worker's health & hygiene at construction camps
6	Consultations with community	Land for borrowing	(i)	Agreement to include borrow area rehabilitation
		Water for construction	(i)	Agreements with owners/community for utilizing water
		Site for construction camps	(i)	Rehabilitation of the land after construction
		Removal of trees	(i)	Compensation for the trees cut
		Cultural properties	(i)	Avoidance through design modifications
			(ii)	Relocation costs to be covered in the project, if needs relocation
		Common property resources	(i)	Avoidance through design modifications
			(ii)	Relocation costs to be covered in the project, if needs relocation
		Traffic during construction	(iii)	Provision of alternate routes or prior notice to the users
7	Finalization of alignment	Concerns of community	(i)	Community concerns to be incorporated
		Environmental impacts identified	(ii)	Impacts identified are to be mitigated by incorporation of provisions as per ESMF and EMP for subprojects in SUTP
		Design aspects	(iii)	Impacts that can be mitigated through design modifications should be incorporated
8	Preparation of detailed drawings	All concerns/impacts identified	(i)	Designs for enhancements and mitigation measures including cost provisions
9	Monitoring of Progress	All environmental aspects identified	(i)	Monitoring implementation of Environmental measures

(B) Environmental Concerns during project implementation – to be identified in DPR

Sl.No	Activity and Sub Activity	Impact/s	Measure/s	
A	Pre – Construction Activities			
A1.0	Project site identification	-Nil-	(i)	Co-ordination with Revenue Department
A2.0	Relocation of utilities	Impact on current usage	(i)	Identification of relocation site in advance
			(ii)	Scheduling the activity in consonance with the community usage pattern

Sl.No	Activity and Sub Activity	Impact/s	Measure/s	
A3.0	Tree Felling	Compliance with Forest Act in case trees are on forest land	(i)	Prior clearance from Forest Department
		Loss of canopy	(i)	Compensatory plantations & landscape designs
A4.0	Clearance of land	Affect on livelihood	(i)	Will be addressed in the DPR in line with ESMF and the State Policy.
		Affect on cultural properties	(ii)	Design modifications or Relocation of the cultural properties
		Affect on natural habitats	(iii)	Constraining construction activities to construction site only with adequate physical barriers while constructing close to natural habitats
A5.0	Diversion of forest land	Compliance with Forest Act	(i)	Activity scheduling to avoid delays, conformance to legal requirements
		Affect on flora	(ii)	Constraining construction activities to construction site only with adequate physical barriers while constructing close to natural habitats
		Pollution from construction activities	(iii)	Precautions while operating equipment/machinery
A6.0	Transfer of land ownership	Grievances from community	(i)	Addressal through Grievance Redressal Mechanisms & Consultations as per ESMF. A state having WB approved R&R policy shall utilise the existing grievance redressal mechanism based on consultations with affected parties, applied in already implemented/under implementation projects, which will be used with any necessary modifications due to the WB ESMF.
		Affect on livelihood	(ii)	Provision of entitlements as per resettlement framework
A7.0	Location of Storage Yards, labour camps, and construction sites	Pollution from construction camps, storage yards & labour camps	(i)	Location criteria to be adopted
			(ii)	Obtain clearances from SPCB
		Pressure on local infrastructure	(iii)	Contractor has to arrange for infrastructure required as per requirements of the construction activity himself to avoid pressure on local resources
			(iv)	Measures suggested to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.
A8.0	Procurement of equipments and machinery	Machinery likely to cause pollution at settlements and natural habitats	(i)	Machinery to be procured shall be in conformance with emission standards of CPCB
		Safety concerns in machinery operation	(ii)	Safety equipment for workers
			(iii)	Measures suggested to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.
A9.0	Identification and Selection of Material Sources	Conflict of uses in case of water	(i)	Consultations and arrangements at contractor-individual levels, documentation of agreement
		Borrowing causes depressed lands	(ii)	Consultations and arrangements at contractor-individual levels, documentation of agreement
		Pollution due to material extraction from borrow and quarry areas to surrounding environment	(iii)	Precautionary measures during siting of borrow areas and quarry areas
		Disturbance to Natural Habitats	(iv)	Avoidance of location of material sources in

Sl.No	Activity and Sub Activity	Impact/s	Measure/s	
				Natural Habitats
			(v)	Measures suggested to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.
A10.0	Waste disposal	Pollution due to location close to settlements, water bodies & other sensitive areas	(i)	Waste to be disposed off at predesignated disposal sites and should be located away from habitation, natural habitats, catchment areas of waterbodies and arrangements should be made to avoid leachate entering ground water.
			(ii)	Measures suggested to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.
B	Construction Activities[8]			
B1.0	Site Clearance			
B1.1	Clearing and Grubbing	Effect on vegetation	(i)	Restricting movement of machinery/equipment
		Debris generation creating unsightly conditions	(ii)	Disposal / storage of grubbing waste and possible reuse
B1.2	Dismantling of existing facilities / structures	Generation of Debris creating unsightly conditions	(i)	Disposal of waste and likely reuse
		Flooding due to interception to drainage paths	(ii)	Provision of diversion channels and/or scheduling construction of culverts in dry months
B2.0	Planning Traffic diversions and Detours	Inconvenience to public	(i)	Activity scheduling, identification of alternative track
B3.0	Material Procurement	Formation of stagnant water pools due to borrowing/quarrying	(i)	Rehabilitation plan for borrow areas & quarry areas
		Illegal quarrying / sand mining	(ii)	Conformance of quarries selected to the SPCB requirements, including quarry rehabilitation plans
		Uncontrolled blasting at quarries	(iii)	Controlled blasting to the extent required. Conformance to blasting rules as per the Indian Explosives Act
B4.0	Materials handling at site			
B4.1	Storage of materials	Contamination to water sources, leaching into ground water	(i)	Provision of impervious base to storage areas
B4.2	Handling of earth	Dust rising and increase in particulate concentration in ambient air	(i)	Use of dust suppressants
B4.3	Handling of fly ash	Increase of particulate concentration and contamination of nearby areas	(i)	Use of dust suppressants
B4.4	Handling of granular material	Risk of injury to workers	(i)	Use of Personal Protective Equipment
B4.5	Handling of bituminous materials	Leaching of materials, contamination of water sources	(i)	Provision of impervious base at bitumen storage areas
		Air pollution	(ii)	Control of emissions from mixing
B4.6	Handling of oil/diesel	Contamination from accidental spills	(i)	Prevention of accidental spills, affecting cleaning immediately after spill
		Pollution due to incomplete burning	(ii)	Ensure complete combustion of fuel through regular maintenance of equipment
B4.7	Waste management	Littering of debris at construction site	(i)	Waste to be disposed at disposal locations only
		Contamination of surroundings	(ii)	Prevention of runoff from entering water

[8] Annexure – 6 provides the contract clauses to be built into the procurement documents.

Sl.No	Activity and Sub Activity	Impact/s	Measure/s	
		due to runoff from construction site		bodies
B4.8	Operation of construction equipments and machinery	Air & Noise pollution	(i)	Conformance to Emission standards and norms
		Operational safety of workers	(ii)	Conformance to Safety concerns of the road users and workers in operation, first aid provision and mandatory provision of Personal Protective Equipment
B4.9	Movement of Machinery	Trampling of vegetation	(i)	Restriction of movement to constuction site
		Damage to flora & natural habitats	(ii)	Minimizing impact on vegetation
		Damage to road side properties	(iii)	Minimizing impacts on private and common properties, including religious structures
B5.0	Earthworks	Waste generation	(i)	Safe disposal of waste & possible reuse
		Dust Rising	(i)	Dust suppression with water
		Contamination of water bodies/ water courses	(i)	Control measures as silt fencing, vegetative barriers etc
			(ii)	Avoiding disposal of liquid wastes into natural water courses
B5.1	Maintenance at construction camp	Collection of rainwater in construction camps	(i)	Temporary drains during construction
		Waste water from labour camps	(i)	Disposal of waste water into soak pits
		Contamination of soil	(i)	Removal of oil / other chemical spills & wastes
B6.0	Construction Material Use	Extensive extraction of quarry materials	(i)	Use of locally available materials
		Extensive water requirement	(i)	Scheduling the activity in wet months
			(ii)	Avoiding conflict of uses due to water extraction from construction
		Pollution of water channels during construction	(i)	Control of sediment runoff
		Safety of Workers	(i)	Mandatory use of Personal Protective Equipment
B7.0	Bitumen works	Worker's safety during handling of hot mix	(i)	Mandatory use of Personal Protective Equipment
		Damage to vegetation (burning/ cutting)	(ii)	Avoiding use of wood as fuel for heating bitumen
			(iii)	Hot mix plant location on waste lands
		Contamination due to bituminous wastes	(iv)	Reuse or Land filling of bituminous wastes
		Impacts on Air quality	(v)	Ensuring compliance of hotmix plants with the CPCB emission standards
B8.0	Concrete works	Contamination of surroundings due to concrete mixing	(vi)	Mixing concrete at designated locations away from habitation and agriculture lands
B9.0	Enhancements	-Nil-	(i)	To be included in DPR
B10.0	Monitoring environmental conditions	-Nil-	(i)	To be as per the codes of environmental practice
C	Post Construction Activities[9]			
C1.0	Clearing of construction camps			
C1.1	Campsite restoration	Change of landuse due to setting up of construction camp	(i)	Campsite to be restored to its original condition as per the rehabilitation plan

9 The data compiled from these activities has to be reported during project implementation in appropriate project reports

Sl.No	Activity and Sub Activity	Impact/s	Measure/s
C1.2	Dismantling of campsite	Waste generation at the construction site	(iii) Disposal of waste at designated locations
C2.0	Clearing of Water Channels, side drains and culverts	Generation of debris & silt	(i) Removal of Debris and disposal
C3.0	Rehabilitation of borrow areas	-Nil-	(i) Top soil restoration, revegetation
C4.0	Clearing of encroachments	Loss of livelihood	(i) Precautionary measures to avoid encroachments

(C) Social Concerns in DPR Preparation

Sl. No.	Activity	Items to consider	S.No.	Measures to Address
1	Preliminary Project Information	Land Acquisition	(i)	Estimation of land requirement by ownership for the project
		Structures Lost	(i)	Estimate likely number of loss
		Assets Lost		
		Cultural properties		
		Community facilities		
2	Detailed Surveys	Census Survey	(i)	Conduct census and socio-economic survey to identify number of PAPs, structures, assets lost, vulnerable groups impacted, squatters and encroachers.
		Socio-Economic Survey		
		Cultural property surveys	(i)	Inventory of cultural property impacted
		Common property resources	(i)	Inventory of common property resources impacted
4	Assessment of Social Impacts	Loss of land	(i)	Estimate extent of loss of land by PAPs
		Loss of property	(i)	Estimate number of structures impacted including partial and total impacts
		Loss of livelihood	(i)	Estimate number of livelihoods lost including employees/workers in commercial/industrial establishments
		Impacts on squatters	(i)	Number of squatters and encroachers to be identified
		Impacts on encroachers	(ii)	Separate lists for mobile/ambulatory vendors to be compiled
		Impacts on vulnerable groups	(i)	Estimate number of vulnerable groups impacted
		Impacts on cultural properties	(i)	Estimate number of cultural properties impacted
		Impacts on community properties	(i)	Estimate number of community properties impacted
6	Consultations with community	Socio-Economic Survey	(i)	Conduct consultations with community informing survey timings and purpose
		Census Survey		
		Cultural properties	(i)	Avoidance through design modifications
			(ii)	Relocation costs to be covered in the project, if needs relocation
		Common property resources	(i)	Avoidance through design modifications
			(ii)	Relocation costs to be covered in the project, if needs relocation
		Compensation and Assistance	(i)	Information dissemination on entitlement matrix and the provisions for compensation and assistance
		Grievance Redressal	(i)	Sort grievances related to compensation amount for land, valuation of structure and payment of compensation and assistances
7	Finalization of alignment	Concerns of community	(i)	Identify concerns of community regarding project outcomes
		Social Impacts	(i)	Consultations to identify any other social impacts as seen by the community
		Design aspects	(i)	Explore possible changes in design in order to reduce social impacts to minimum
8	Preparation of detailed drawings	All concerns/impacts identified	(i)	Designs for enhancements and mitigation measures including cost provisions
9	Monitoring of Progress	All social aspects identified	(i)	Monitoring implementation of social measures

(D) Social Concerns in Implementation – to be identified in DPR

Sl.No.	Activity and Sub Activity	Impact/s	Measure/s	
A	**Pre – Construction Activities**			
A1.0	**Project site identification**	-Nil-	(i)	Co-ordination with Revenue Department
A2.0	**Relocation of utilities**	Impact on current usage	(i)	Identification of relocation site in advance
			(ii)	Scheduling the activity in consonance with the community usage pattern
A3.0	**Clearance of land**	Loss of Land	(i)	As per provisions in Entitlement Framework
		Loss of Structure and Assets	(i)	As per provisions in Entitlement Framework
		Affect on livelihood	(i)	As per provisions in Entitlement Framework
		Affect on cultural properties	(i)	Design modifications or Relocation of the cultural properties
		Affect on community properties	(i)	Design modifications or Relocation of the community properties
B	**Construction Activities**			
B1.0	**Site Clearance**	Affect on assets	(i)	A 2 months notice shall be given for the removal of structures (Included as part of provisions in Entitlement Framework).
			(ii)	The owner/tenant (in cases where a tenant occupies the structure) shall be given the right to salvage material from the structure (Included as part of provisions in Entitlement Framework).
		Affect on Squatters (including mobile and ambulatory vendors)	(i)	Benefits and assistances to be provided as per the Entitlement Framework
		Affect on Encroachers	(i)	Encroachers will be notified a time in which to remove their assets (Included as part of provisions in Entitlement Framework).
			(ii)	Right to salvage materials from the demolished structure (Included as part of provisions in Entitlement Framework).
		Affect on agricultural crops	(i)	A four months advance notice shall be given to salvage crops.
		Affect on perennial crops such as fruit trees	(i)	Compensation as per Entitlement Framework
		Temporary loss of access	(i)	Alternative access to be provided
B2.0	**Dismantling of existing facilities / structures**	Temporary loss of usage of facilities	(i)	Scheduling the activity in consonance with the community usage pattern
B3.0	**Planning Traffic diversions and Detours**	Inconvenience to public	(i)	Activity scheduling, identification of alternative track
		Temporary loss of access	(i)	Alternative access to be provided
B4.0	**Materials handling at site**	Construction workers health impacts	(i)	Provision of first aid faciliteis in construction camp
			(ii)	Emergency health care in the form of ambulances to be made available
		Construction workers and host population health concerns	(i)	Awareness programmes on HIV/STDs
			(ii)	Free health check ups and distribution of condoms
			(iii)	Periodic checking of drinking water quality, sanitation and waste disposal mechanism
B5.0	**Operation of construction equipments and machinery**	Operational safety of workers	(i)	Conformance to Safety concerns of the road users and workers in operation, first aid provision and mandatory provision of Personal Protective Equipment
B6.0	**Construction Material Use**	Safety of Workers	(i)	Mandatory use of Personal Protective Equipment
C	**Post Construction Activities**			
C1.0	**Rehabilitation activities**	Relocation site	(i)	Ensure compliance with Entitlement

Sl.No.	Activity and Sub Activity	Impact/s	Measure/s
			Framework provisions

Annex-3

STAGES AND CATEGORISATION IN PRIOR ENVIRONMENTAL CLEARANCE PROCESS

A) Stages of Prior Environmental Clearance

Sl. No	Stage	Project Category	Authority responsible for EC	Purpose of the Stage	Forms Used
1	Screening	Category B		To check whether the project requires environmental impact assessment or not If EIA required: Category B1 If EIA not required: Category B2	1
2	Scoping	Category A	Expert Appraisal Committee	To decide the Terms of Reference (TOR) addressing all relevant environmental concerns for EIA.	
		Category B1	State level Expert Appraisal Committee	To decide the Terms of Reference (TOR) addressing all relevant environmental concerns for EIA.	
3	Public Consultation	Category A and Category B1	State Pollution Control Board (SPCB) or the Union territory Pollution Control Committee (UTPCC)	Public hearing at the site or in its close proximity- district wise, to be carried out as prescribed in the notification. obtain responses in writing from other concerned persons	
4	Appraisal	Category A and Category B1	Expert Appraisal Committee or State Level Expert Appraisal Committee	Detailed scrutiny of the documents submitted by the applicant for grant of environmental clearance.	Final EIA report, outcome of the public consultations including public hearing proceedings
		Projects not requiring Public Consultation (excluding Item 8 of the schedule)	Expert Appraisal Committee or State Level Expert Appraisal Committee	Detailed scrutiny of the documents submitted by the applicant for grant of environmental clearance.	Form 1, and Pre-feasibility Report
		Item 8 of the schedule: Building and Construction projects, Townships and Area Development projects	Expert Appraisal Committee or State Level Expert Appraisal Committee	Detailed scrutiny of the documents submitted by the applicant for grant of environmental clearance.	Form 1, Form 1A and the conceptual plan

Scoping is not required for Projects Construction / Township / Commercial Complexes / Housing only (Category B). They are appraised by the State Expert Appraisal Committee based on the Form 1 / Form 1A & conceptual plan.

Public Consultation is not required for following projects:

1. Modernization of irrigation projects (item 1(c) (ii) of the Schedule)
2. All projects or activities located within industrial estates or parks (item 7(c) of the Schedule) approved by the concerned authorities, and which are not disallowed in such approvals

3. Expansion of Roads and Highways (item 7 (f) of the Schedule) which do not involve any further acquisition of land
4. All Building /Construction projects/Area Development projects and Townships (item 8)
5. All Category 'B2' projects and activities
6. All projects or activities concerning national defence and security or involving other strategic considerations as determined by the Central Government

The infrastructure projects which require prior environmental clearance as per the Schedule under section 2 of this notification are as below:

B) Categorization of Urban Infrastructure Projects

Project or Activity		Category with threshold limit		
		A	B	Conditions if any
7		Physical Infrastructure including Environmental Services		
7(a)	Air ports	All projects	-	-
7(c)	Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes.	If at least one industry in the proposed industrial estate falls under the Category A, entire industrial area shall be treated as Category A, irrespective of the area. Industrial estates with area greater than 500 ha. And housing at least one Category B industry.	-Industrial estates housing at least one Category B industry and area <500 ha. -Industrial estates of area> 500 ha. and not housing any industry belonging to Category A or B.	Special condition shall apply Note: Industrial Estate of area below 500 ha and not housing any industry of category A or B does not require clearance.
7(d)	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	All integrated facilities having incineration &landfill or incineration alone	All facilities having land fill only	General Condition shall apply
7(e)	Ports & Harbours	≥ 5 million TPA of cargo handling capacity (excluding fishing harbours)	< 5 million TPA of cargo handling capacity and/or ports/ harbours ≥10,000 TPA of fish handling capacity	General Condition shall apply
7(f)	Highways	i) New National High ways; and ii) Expansion of National High ways greater than 30 KM, involving additional right of way greater than 20m involving land acquisition and passing through more than one State.	i) New State High ways; and ii) Expansion of National / State Highways greater than 30 km involving additional right of way greater than 20m involving land acquisition.	General Condition shall apply

Project or Activity		Category with threshold limit		
		A	B	Conditions if any
7(h)	Common Effluent Treatment Plants (CETPs)		All projects	General Condition shall apply
7(i)	Common Municipal Solid Waste Management Facility (CMSWMF)		All projects	General Condition shall apply
8		**Building / Construction projects / Area Development projects and Townships**		
8(a)	Building and Construction projects		≥ 20000 sq.m and <1,50,000 sq.m. of built-up area#	#(built up area for covered construction; in the case of facilities open to the sky, it will be the activity area)
8(b)	Townships and Area Development projects		Covering an area ≥ 50 ha and or built up area ≥1,50,000 sq .mtrs ++	++All projects under Item 8(b) shall be appraised as Category B1

General conditions will be applicable if any project or activity specified in Category 'B' will be treated as Category A, is located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Annex – 4

OTHER APPLICABLE ENVIRONMENTAL LEGISLATIONS

(a) The Environment (Protection) Act, 1986

The Environment (Protection) Act was conceived as an "umbrella legislation" seeking to supplement the existing laws on the control of pollution (the water Act and the Air Act) by enacting a general legislation for environment protection and to fill the gaps in regulation of major environmental hazards. The Ministry of Environment & Forests (MoEF), Government of India under the Act has passed notifications regulating siting of industry and operations. The relevant provisions of act are as follows:

- Section 6 of the act empowers Central government to
  - Make rules to regulate environmental pollution by prescribing standards for the quality of air, water, soil for various areas and purposes.
  - Set the maximum allowable limits of concentration of various environmental pollutants (including noise)
  - Prohibit and restrict location of industries and carrying of process in various environmentally sensitive areas
  - Set the procedures and safeguards for prevention of accidents which may cause environmental pollution
- Section 7 prohibits carrying out of any industry, operation or process which discharges or emits environmental pollution in excess of standards
- Section 8 of the act regulates handling of hazardous substances
- Section 9 states, the persons responsible for discharges, bound to prevent or mitigate environmental pollution and intimate any accidents due to any occurrences.

(b) Water (Prevention and Control of Pollution) Act, 1974 - As Amended In 1978 & 1988

The Act vests regulatory authority on the State Pollution Control Boards and empowers them to establish and enforce effluent standards for industries and local authorities discharging effluents. This act also assigns responsibilities to the State Pollution Control Boards which include: prevention, control or abatement of pollution of streams and wells in the State; to organize mass education programmes relating thereto; lay down, modify annul effluent standards for the sewage and trade effluents and for the quality of receiving waters (not being water in an inter-state stream) resulting from the discharge of effluents and to classify waters of the State; to evolve economical and reliable methods of treatment of sewage and trade effluents, etc. Provisions of this act are not relevant to the SUTP.

(c) Noise Pollution (Regulation and Control) Rules, 2000

These rules are meant to regulate and control the ambient noise in public places from various sources inter alia industrial activity, construction activity, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices. Under rule 3(i) and 4(i), four different zones are designated for maintaining maximum level of ambient noise. These zones are residential, commercial, industrial and silence zones.

The State Government designates an authority, which includes District Magistrate, Police Commissioner or any other officer designated for the purpose of maintaining ambient air quality standards as per the rules in force any time. The project attracts provisions of these rules in case of construction and operation activities towards regulation of noise.

(d) Forest (Conservation) Act, 1980 - As Amended In 1988

The Central Government enacted The Forest (Conservation) Act in 1980 to stop large-scale diversion of forestland for non-forest use. As amended in 1988, as per the Act, no State Government or any authority shall make, except with the prior approval of the Central Government order directing:

- Reserved forest or any portion thereof shall cease to be reserved;
- Any forest land or any portion thereof may be used for any non-forest purpose;
- Any forest land or any portion thereof may be assigned by way of lease or otherwise to any private person to any authority corporation, agency or any other organization not owned, managed by Government; and
- Any forest land or any portion thereof may be cleared of trees, which have grown naturally in that land or portion for the purpose of using it for re-forestation

Restrictions and clearance procedure proposed in the Forest (Conservation) Act applies wholly to the natural forest areas, even in case the protected/designated forest area does not have any vegetation cover.

(e) Wild Life Protection Act, 1972

An act to provide for the protection of wild animals birds and plants and for matters connected therewith. The provisions under this act are:

- Section 9 of the Act mentions that no person shall hunt any wild animal specified in Schedule I;
- The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forestland;
- It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife in a sanctuary;
- No alteration of the boundaries of a National Park shall be made except on a resolution passed by the Legislature of State; and
- Destruction or damaging of any wildlife property in national Park is prohibited.

(f) CRZ Regulations of MoEF, 1991

All coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action up to 500 m from the High Tide Line and the land between the Low Tide Line and the High Tide Line comes within the jurisdiction of Coastal Regulation Zone. (HTL is defined based on the spring tides). However, the distance from the HTL to which the proposed regulations will apply in the case of rivers, creeks and backwaters may be modified on a case to case basis for reasons to be recorded while preparing Coastal Zone Management Plans by the competent authority. However, in this latter case, the distance from the HTL will not be less than 100 meters or width of the creek, river or back water, whichever is less. For regulating development activities, the coastal stretches within 500 metres of High Tide Line on the landward side are classified into four categories, namely:

- CRZ-I: (i) Areas that are ecologically sensitive and important, such as national parks/marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/historically/heritage areas, areas rich in genetic diversity, areas likely to be inundated due to rise in sea level consequent upon global warming and such other areas, and (ii) Area between Low Tide Line and the high Tide Line
- CRZ-II: The areas that have already been developed upto or close to the shoreline. For this purpose, "developed area" is referred to as that area within the municipal limits or in other legally designated urban areas which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains
- CRZ-III: Areas that are relatively undisturbed and those, which do not belong to either CRZ-I or CRZ-II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas which are not substantially built up
- CRZ-IV: Coastal stretches in the Andaman & Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III

The development or construction activities in different categories of CRZ area shall be regulated by the concerned authorities at the State/Union Territory level, in accordance with norms stipulated in the CRZ regulation and in the state / UT coastal zone management plan. This act is applicable to the project interventions in Thiruvananthapuram as it is the only coastal city considered amongst the project cities.

Annex – 5

WORLD BANK SAFEGUARD POLICIES

A) Environmental Assessment (OP 4.01)

The World Bank environmental assessment (EA) requirements are based on a three-part classification system such as Category A, Category B and Category C as defined by the World Bank OP 4.01. A project designated as Category A, requires a full environmental assessment (EA) Category B projects require a lesser level of environmental investigation. Category C projects require no environmental analysis beyond that determination.

If any of the sub-projects are Category 'A', they would require full environmental analysis. However, emphasis of the World Bank is in the integration of mitigation measures into the project design and mainstreaming environment in all stages of project planning, implementation and operation.

The EA ensures that appropriate levels of environmental and social assessment are carried out as part of project design, including public consultation process, especially for Category A and B projects. The OP 4.01 is applicable to all components of Bank financed projects, even for co-financed components.

B) Involuntary Resettlement (OP/BP 4.12)

The Policy on Involuntary Resettlement is intended to assist displaced people arising from development projects, in order not to impoverish any affected people within the area of influence of projects. An action plan that at least restores the standard of living must be instituted, in cases where resettlement is inevitable or loss of assets and impacts on livelihood occurs. Public consultation of "re-settlers" as well as the host communities is significant for the successful resettlement process and implementation of the action plan, in order to incorporate appropriate choices.

C) Forestry (OP/BP 4.36)

The OP/BP 4.36 aims at enhancing the environmental and social contribution of forested areas, and the need to reduce deforestation. The protection of forests through the control of forest-related impact of all investment operations is a concern of the policy. It promotes the restriction of operations affecting critical forest and conservation areas, while requiring that the sector and other relevant stakeholders should be consulted as appropriate.

D) Management of Cultural Property (OPN 11.03)

The policy is premised on the need to investigate and take inventory of cultural resources likely to be affected. Mitigations are provided for in cases of adverse impacts on physical cultural resources. Mitigation measures should be undertaken in conjunction with the appropriate authorities, organizations and institutions who are also required to be consulted and involved in the management of cultural property. The Bank does not support development actions likely to significantly damage nonreplicable cultural property, and does assist only those projects sited or designed to prevent such damage.

C) Bank's Policy on Disclosure

The Bank's policy on disclosure currently under review requires that all the people residing in the given areas of a project have the right to be informed of the proposed development project in their respective areas. Prior to project appraisal therefore, the summary of the study of the development action along with other relevant information should be disclosed to or at the level of the Bank and the project area.

Annex – 6

ENVIRONMENTAL MANAGEMENT FRAMEWORK

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
Location / Design / Pre-construction	**Environmental Impacts**														
	Location of project facilities and infrastructure near environmentally sensitive areas as parks, ponds, lakes, urban forests etc., likely to contaminate the precincts	Others-Road Infrastructure[10]		✓			✓		✓		✓		Project design shall inventorise environmental features in the influence area of the project area and avoid location of these sub-components near these features. Pollutants from construction sites will not be allowed to flow into the precincts of these areas during any of the subsequent project implementation stages by design and development of appropriate pollution control infrastructure. Examples of such measures include (i) erection of silt fencing to avoid flow of pollutants during construction and operation stages into water bodies. (ii) Developing buffer plantations along / around project facilities to avoid dust and air pollutants entering these precincts (iii) construction of noise screens to avoid noise pollution in these areas etc.,	PIU / Design consultant	These provisions will form part of the Terms of Reference for preparation of EA / SA for subprojects which should be in line with the provisions of ESMF
		Public Transport Infrastructure[11]							✓		✓				
		Pedestrian / NMT Infrastructure Improvement[12]		✓			✓			✓					
	Location of project facilities in heavily trafficked areas will induce traffic snarls for the period of construction and contribute to increase in air pollution levels and noise pollution	ITS application to Public Transport[13]	✓			✓		✓			✓		A Traffic Management Plan that ensures smooth flow of traffic during construction time and if necessary planning of road diversions will be undertaken	PIU / Design Consultant	This provision will be covered as part of the Terms of Reference provided to the Design Consultants who would be preparing the Detailed Design Report.
		Others-Road Infrastructure		✓	✓		✓		✓	✓					
		Public Transport Infrastructure							✓		✓	✓			
	Location of borrow areas and quarry areas close to environmentally sensitive areas would induce environmental	Others-Road Infrastructure		✓			✓		✓				Identification and location of borrow and quarry areas will avoid their location near environmentally sensitive areas	PIU / Design consultant / Contractor	The contractor shall identify and seek prior approval of the engineer for quarrying and borrowing operations. Quarry and borrowing

[10] Others – Road Infrastructure: Retrofitting of Bus Fleet, Minor Road improvements, Junction/Rotary Improvements, Rail Under Bridges

[11] Public Transport Infrastructure: Dedicated Bus-lanes, Terminals/Depots/Commuter Amenity Centres, Procurement of Bus Fleet, Traffic Signal Prioritization

[12] Pedestrian / NMT Infrastructure Improvement: Reconstruction of footpaths, Provision of Sub-ways / FoBs, Pedestrian Prioritization measures through traffic signals, pelican lights, road marking etc., Construction of new footpaths, Paving and Delineation of areas as pedestrian friendly precincts, Peripheral Vehicular Parking, Construction of cycle lanes, Street Furniture, Lighting & Bollards

[13] ITS Application to Public Transport: Traffic Signal Improvements, Automatic Fare Collection, Public Information System-Plasma Screens, Display boards at bus stops etc, Control Rooms

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
		Public Transport Infrastructure							✓		✓				
	Social / Resettlement Aspects														
	Speculation of land prices, more specifically in case of terminals and road improvements is an identified impact which is both beneficial as well as harmful	Others-Road Infrastructure		✓			✓						Cut-off date in case of likelihood of land acquisition should be established early in the project cycle to reduce influence of price rise speculations	PIU / Design consultant	These provisions will form part of the Terms of Reference for preparation of EA / SA for subprojects which should be in line with the provisions of ESMF
		Public Transport Infrastructure		✓			✓		✓		✓				
	Psychological distress to potential PAPs is considered a major impact during or due to design	Others-Road Infrastructure		✓	✓		✓			✓			Information dissemination on the project proposals and likely alternatives needs to be carried out as soon as possible in the project area. This is best done through community consultation sessions. Opinion of the community and potential PAP should be considered in the design process and feedback should be provided to the concerned PAPs	PIU / Design consultant	These provisions will form part of the Terms of Reference for preparation of EA / SA for subprojects which should be in line with the provisions of ESMF
		Public Transport Infrastructure					✓		✓		✓				
	Acquisition of land for the facilities causes – R&R issues as loss of livelihood, loss of shelter, severance of community & social ties	ITS application to Public Transport	✓ [14]					✓	✓		✓		Conducting Social Assessment (SA) and prepare a Resettlement Action Plan (RAP) to address these issues in accordance with the ESMF. All R&R activities shall be completed prior to start of civil works and the contractor will be provided project area that is free from encumbrances	PIU / Design consultant	Provisions for conduct of SA and RAP will be covered as part of the ToR provisions for Design Consultant. RAP implementation is to be carried out by the PIU with the help of Revenue Department and / or an external consultant whose ToR would cover the R&R implementation provisions with necessary time frame.
		Others-Road Infrastructure		✓	✓		✓			✓					
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓			✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Relocation of road appurtenances and utility lines	Pedestrian / NMT Infrastructure Improvement		✓	✓		✓			✓	✓	✓	Prepare a Utility Relocation Plan in accordance with the clear land requirements for the project	PIU / Design Consultant / Supervision Consultant / Contractor	(i) Utility relocation plan is to be prepared by the Design Consultant. (this is to be covered as part of the ToR for Design Consultant) (ii) The contractor shall carry out relocation of utilities with in the project area and areas that are likely to be temporarily impacted. This relocation shall be in accordance with the Utility Relocation Plan and with the approval of the Engineer under the Supervision Consultant. All relocation works should be completed prior to start of civil works
		Public Transport Infrastructure						✓	✓		✓				
	Use of existing pavement widths that are encroached will cause removal of squatters and encroachments from roadsides causing loss of livelihood and loss of shelter	Others-Road Infrastructure		✓			✓			✓			Appropriate measures as per the Resettlement Action Plan / Entitlement Matrix are to be undertaken	PIU / Supervision Consultant	Entitlements as per the RAP and entitlement matrix shall be calculated and disbursed as per the schedule provided in RAP
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
C	**Environmental Impacts**														

[14] Land for setting up of control centre if located on private land

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
	Minor construction issues in erecting the necessary infrastructure for fare collection	ITS application to Public Transport	✓				✓	✓			✓		Environmental management measures as per the EMP prepared for specific sub-projects and / or Environmental and Social Management Framework need to be implemented. If no major construction equipment is involved, measures for offsetting impacts shall be as per the ESMF and will be included as part of the DPR.	Supervision Consultant / Contractor	All environmental provisions in the applicable specifications for the works should be adhered to as part of the good engineering practices while adhering to the provisions of the EMP for the specific sub-projects where applicable. For projects where no major construction equipment is involved, all provisions as per ESMF shall be followed and included in the DPR
	Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times	Others-Road Infrastructure		✓	✓		✓			✓	✓		A traffic management plan to address the traffic congestion issues that are likely to be encountered during the construction time is to be implemented	Supervision Consultant / Contractor	Necessary arrangements for diversion of traffic in the project areas shall be completed prior to initiation of civil works as per the Traffic Management Plan with prior approval of the Engineer of Supervision Consultant
		Pedestrian / NMT Infrastructure Improvement	✓	✓	✓		✓			✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Temporary increase of noise levels due to idling and traffic snarls	Others-Road Infrastructure		✓	✓		✓			✓			Traffic management measures to be undertaken in accordance with the traffic management plan will avoid traffic snarls as well as idling traffic during construction	Supervision Consultant / Contractor	Necessary arrangements for diversion of traffic in the project areas shall be completed prior to initiation of civil works as per the Traffic Management Plan with prior approval of the Engineer of Supervision Consultant
		Pedestrian / NMT Infrastructure Improvement	✓	✓	✓		✓			✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Air and noise pollution from construction activities	Others-Road Infrastructure		✓	✓		✓			✓			All construction machinery shall be complaint with the air and noise pollution norms of CPCB for construction equipment. Construction activities causing high ambient noise during night time will be avoided and such activities will be restricted to day time. All vehicles plying for construction activities will strictly adhere to emission norms prevailing in the country. Dust suppression measures as watering of construction site shall be carried out to reduce dust pollution.	Supervision Consultant / Contractor	The contractor shall ensure compliance of all construction machinery and equipment with the emission standards of CPCB. All vehicle shall regularly be checked for emissions and ensured that they have a PUC Certificate
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Alternate traffic diversion routes increasing route length and consequently emissions	Others-Road Infrastructure		✓			✓		✓		✓		A traffic management plan to divert and / or manage the traffic flow along the project roads or circumvent project sites shall be notified to the residents through display signs as well as newspaper advertisements	Supervision Consultant / Contractor	The contractor shall notify the residents through appropriate medium in vernacular on the traffic diversions undertaken prior to implementation
		Pedestrian / NMT Infrastructure Improvement		✓			✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Construction / reconstruction / improvement will result in minor construction issues as: (i) Generation of noxious gases during construction – increasing air pollution (ii) Temporary increase in noise pollution during	Others-Road Infrastructure		✓	✓		✓			✓			(i) All concrete used in the construction works will be manufactured at centralised locations in Batching plants which will be located away from habitations and environmentally sensitive areas. Similarly, all bitumen mix will be at Hot Mix plants only. All construction vehicles will	Supervision Consultant / Contractor	The contractor shall implement the EMP in its sprit of offsetting any environmental impacts that may arise from implementation of the project
		Pedestrian / NMT Infrastructure Improvement	✓	✓	✓		✓		✓	✓	✓	✓			

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
		Public Transport Infrastructure					✓		✓		✓				
	Safety and health of construction workers	Others-Road Infrastructure		✓	✓		✓		✓	✓			Workers undertaking road furniture installation will be provided with adequate safety gear while working at higher ground. Workers installing electrical equipment will be provided with insulating equipment and necessary protective gear Ground personnel will be provided with helmets, gloves, boots and other protective gear as necessary	Supervision Consultant / Contractor	The contractor shall provide all necessary Personal Protective Equipment as necessary for avoidance of occupational hazards. Contractor shall ensure that the workers wear them while conduct of such activities contrary to which there will penalisation proceedings against the worker and will be strictly prohibited from conducting such activity.
		ITS application to Public Transport	✓			✓		✓	✓		✓				
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓	All workers engaged in batching and hot mix plants will be provided with Personal Protective Equipment as protective masks, helmets, gumboots All welding workers will be provided with protective eye wear	Supervision Consultant / Contractor	The contractor shall provide all necessary Personal Protective Equipment as necessary for avoidance of occupational hazards and ensure that the workers wear them while on construction site at all times without which entry / conduct of such activities will be strictly prohibited.
		Public Transport Infrastructure					✓		✓		✓				
	Indiscriminate disposal of construction debris in and around construction sites will cause unhygienic conditions in the area	Others-Road Infrastructure		✓	✓		✓			✓	✓		Disposal sites are to be identified prior to start of dismantling or construction activities in the project area. The sites are to be located away from environmentally sensitive areas and ground water recharge areas. The disposal site should be prepared for collection of leachate in case of disposal of hazardous material as bitumen wastes to avoid contamination of ground and surface water sources. The selected sites should be approved by the supervision consultant and consent to dispose should be provided in writing. Necessary permissions and clearances from the local government and the public should be obtained by the contractor and scrutinised subsequently by the Supervision Consultant.	Supervision Consultant / Contractor	The contractor shall prior to start of construction and dismantling operations identify potential sites for disposal of hazardous construction debris, sites for general construction wastes and domestic wastes from construction camps. The contractor has to obtain approval on identified sites from the Engineer of Supervision Consultant and disposal shall be only after consent letter from the Engineer
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Alternate traffic diversion routes exposing previously low traffic routes to higher urban traffic and increasing air / noise pollution	Others-Road Infrastructure		✓			✓						A traffic management plan to address the traffic congestion issues that are likely to be encountered during the construction time needs to be prepared. All construction machinery shall be complaint with the air and noise pollution norms of CPCB for	Supervision Consultant / Contractor	Contractor shall adhere to the provisions of the EMP and the traffic management plan.
		Pedestrian / NMT Infrastructure Improvement		✓			✓			✓	✓	✓			

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
		Public Transport Infrastructure					✓		✓		✓				
	Social / Resettlement Aspects														
	Accidental spillage of construction activities to adjacent lands result in temporary relocation and loss of access	Others-Road Infrastructure		✓	✓		✓						Accidental spillages to adjacent lands shall be prevented by barricading the construction site to avoid visual blight. Adequate care as to provide bunds and silt fencing to avoid contaminated flows entering the adjacent lands. Any accidental spillages and trampling shall be made good by the contractor. Adjacent lands required for ease of construction or for facilitating construction during the construction period would be temporarily acquired and compensation as per entitlement matrix is to be paid to the owner / occupant as the case may be. Return of the site to the owner / occupant should be in condition prior to its temporary acquisition or in a condition that is to the satisfaction of the owner / occupant	Supervision Consultant / Contractor	Contractor shall undertake necessary precautionary measures for avoidance of accidental spillage of construction material and debris outside the construction site. Any accidental spillages and impacts on the adjacent lands shall be made good by the contractor. Any temporary acquisitions shall be returned to the owner in its original condition or to the satisfaction of the owner
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Construction activities may cause accidental damages to utilities in the project area	Others-Road Infrastructure		✓	✓		✓			✓			Necessary and adequate care shall be taken by the contractor to avoid accidental impacts on the nearby utilities. Any potential utility that is likely to be damaged or impacted during the construction period should be shifted / relocated prior to start of construction or necessary alternate arrangements in consultation with the community is to be undertaken	Supervision Consultant / Contractor	The contractor shall take necessary and adequate care to avoid accidental impacts to nearby utilities. Any accidental impacts shall be made good by the contractor.
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
	Influx of construction workers in the project areas has the potential to increase spread of HIV/AIDS and other STDs	Others-Road Infrastructure		✓			✓		✓				Adequate HIV / AIDS and STD awareness campaigns are to be conducted regularly in the construction camps to educate the construction workers on the transmission of the disease and precautionary measures towards prevention.	Supervision Consultant / Contractor	The Contractor shall organise HIV / AIDS and STD awareness campaigns in the construction camps. The contractor shall as necessary and as directed by the Supervision Consultant provide for Condom Vending machines in the construction camps. All necessary provisions for hygeine of the workers shall be taken in the construction camps
		Pedestrian / NMT Infrastructure Improvement		✓	✓		✓		✓	✓	✓	✓			
		Public Transport Infrastructure					✓		✓		✓				
Operation Stage	Improvement in safety of pedestrians	Feeder Services	✓						✓				No measures required. This is a positive impact		
		Others		✓	✓		✓		✓						
		Pedestrian / NMT Infrastructure Improvement	✓	✓	✓		✓			✓	✓	✓			

Project Stage	Impact	Type of Project Intervention / GEF Priority	Ahmedabad	Ajmer	Hyderabad	Indore	Jalandhar	Mysore	Naya Raipur	Pune	Pimri - Chinchwad	Trivandrum	Management Measure	Responsibility	ToR Items (Design Stage) / Contract Clause (Construction Stage)
	Improvement in traffic flow and reduction of air / noise emissions and Improvement in urban air quality	ITS application to Public Transport	✔			✔		✔			✔		No measures required. This is a positive impact		
		Feeder Services	✔				✔								
		Others – Road Infrastructure		✔	✔		✔		✔						
		Pedestrian / NMT Infrastructure Improvement	✔	✔	✔		✔			✔	✔	✔			
		Public Transport Infrastructure					✔		✔		✔				
	Increase in signal time for red causing increase in idling and emissions from vehicles / noise	Pedestrian / NMT Infrastructure Improvement	✔	✔	✔		✔		✔	✔	✔	✔	Display of signal times will be considered to inform road users and encourage switching off engines if waiting time is longer	PIU / PMU	
	Pedestrian safety issues from reduction of signal times for pedestrians	Public Transport Infrastructure				✔		✔					Periodic pedestrian counts will be conducted to ascertain the signal times	PIU / PMU	
	Loss of usual transport routes due to delineation of pedestrian routes to NMT – bicycles / cycle rickshaws forcing them onto other roads increasing risk of accidents	Pedestrian / NMT Infrastructure Improvement	✔	✔	✔		✔			✔	✔	✔	Planning of the NMT / pedestrian routes will take necessary care to avoid such encroachments.	PIU / PMU	
	Loss of adequate frontage to commercial / residential establishments	Pedestrian / NMT Infrastructure Improvement		✔	✔		✔			✔	✔	✔	Planning of the NMT infrastructure will take necessary care to avoid such situations	PIU / PMU	
	Reduction of additional lane width for motorized vehicular traffic if existing road width is used for demarcating the cycle lanes	Pedestrian / NMT Infrastructure Improvement		✔	✔		✔			✔	✔	✔	Planning of the NMT infrastructure will take necessary care to avoid such situations	PIU / PMU	
	Increase in traffic – noise and air pollution in the periphery of core city areas	Pedestrian / NMT Infrastructure Improvement		✔								✔	Minimum exit and entry times will be ensured at the vehicular parking areas along with stream lining of the traffic flow in these areas. These would ensure low emissions and reduce noise pollution.	PIU / PMU	

Annex – 7:

TYPICAL TOR / SCOPE FOR ENVIRONMENTAL ASSESSMENT IN SUTP

A) BACKGROUND

As one of the objective of SUTP being adoption of energy efficient modes of transport in the present urban scenario, various such alternatives are being explored and proposed as part of the SUTP. Integration of environmental concerns in the project conceptualization stage would eliminate any major environmental impacts that may arise due to implementation of proposals down the project cycle. Project level decisions that may be necessary at this stage may as well be considered towards enabling energy efficient modes of transport being brought to the mainstream of implementation.

The environmental assessment document assists managers and leaders take conscious decisions to avoid environmental and social impacts. EA in this context is seen as an impact assessment tool the concerns to be addressed would go far beyond environmental issues. This would incorporate decision making tools to interface the scope of application of Project EIAs for identified sub-projects in the SUTP.

The SUTP being administered by the Government of India through the MoUD and concerned state governments, the SEA so prepared would take into account the environmental policy implications of the central and state governments apart from the environmental policies and regulations of multilateral funding agencies agreed to fund for the project. The SEA would thus serve as a guidance manual for addressing environmental concerns at various levels of project conceptualization, planning and project preparation.

B) OBJECTIVE OF THE SERVICES

The main objective of Environment Assessment (EA) is to ensure that the project design and implementation are environmentally sound and sustainable. Further, the objective of EA shall be to provide inputs for selection of sub-projects, preliminary and detailed design of the project. The environmental management plans to be developed as part of the EA is to be used during the implementation of the project for executing the environmental mitigation, enhancement and monitoring measures. In the preparation phase, the EA shall achieve the following objectives:

- Establish the environmental baseline in the study area, and to identify any significant environmental issue;
- Assess impacts of the project, and provide for measures to address the adverse impacts by the provision of the requisite avoidance, mitigation and compensation measures;
- Integrate the environmental issues in the project planning and design; and
- Develop appropriate management plans for implementing, monitoring and reporting of the environmental mitigation and enhancement measures suggested.

C) SCOPE OF WORK

The EA shall comprise of 2 stages – (i) Environmental Assessments (EA) for the individual sub-projects, as required; and (ii) Environmental Management Plans (EMPs) for these individual sub-projects.

The environmental assessment studies and reporting requirements to be undertaken under these TOR must conform to the GOI and the Bank guidelines and regulations, which comprise of, inter alia: The Environmental Impact Assessment Notification, MOEF, 1994 with subsequent amendments; the operational policies, guidelines and the reference materials of the World Bank listed in Annex.

The following section gives the detailed scope of work in each of these stages.

a) Inception

The Consultants shall use the inception period to familiarize with the project details. The Consultants shall recognize that the remaining aspects of the project, such as engineering and social, are being studied in parallel, and it is important for all these aspects to be integrated into the final project design to facilitate their successful implementation. The Consultants should also recognize that due care and diligence planned during the inception stage helps in improving the timing and quality of the EA reports.

During the inception period the Consultants shall (a) study all the project information to appreciate the context within which the EA should be carried-out, (b) identify the sources of secondary information on the project, on similar projects and on the project area, (c) carry out a reconnaissance survey in the urban areas where the subproject interventions are being undertaken, and (d) undertake preliminary consultations with selected stakeholders.

Following the site visits and stakeholder consultations, as well as a review of the conditions of contract between the consultant and the Client, the consultant shall analyse the adequacy of the allocated manpower, time and budgets and shall clearly bring out deviations, if any. The Consultants shall study the various available surveys, techniques, models and software in order to determine what would be the most appropriate in the context of this project on the basis of the best practice examples available with the Bank.

The Consultants shall interact with the social consultants and engineering consultants to determine how the EA work fits into the overall project preparation cycle; how overlapping areas are to be jointly addressed; and to appropriately plan the timing of the deliverables of the EA process. These shall be succinctly documented in the Inception Report. The Consultant shall also specify what support and inputs the Consultant will require from and provide to the implementing agency, social consultant and Engineering consultant.

b) Environmental Assessment (EA)

The EA shall identify all potential environmental issues in the project; and shall develop a management measures for addressing all these issues. To this end, the EA shall consist of (i) overall environmental baseline; (ii) Stakeholder Identification & Consultation (iii) project and regional level environmental issues that would need to be considered in the analysis of alternatives, planning and design of the sub-projects and establish their criticality in the context of the proposed project; (iv) a plan to address the identified project and regional environmental issues; (v) a plan for building adequate environmental management capacity in the implementing agency (or Client). Each of these is described below:

a) Overall Environmental Baseline

All regionally or nationally recognised environmental resources and features within the project's influence area shall be clearly identified, and studied in relation to activities proposed under the project. These will include all protected areas (national parks, wildlife sanctuaries, reserved forests, RAMSAR sites, biosphere reserves, wilderness zones), unprotected and community forests and forest patches, all wetlands, rivers, rivulets and other surface water bodies. In the context of each project city, sensitive environmental features will include the elephant and wildlife corridors if any, all meandering rivers, all flood-prone areas, all areas of severe landslide and river erosion, all flood embankments (some of which are also used as roads). Consultants shall consolidate all these information in a map of adequate scale (1:50,000 minimum), superimposed with the city's circulation network.

b) Stakeholder Identification & Consultation

Consultation with the stakeholders shall be used to improve the plan and design of the project rather than as project information dissemination sessions. The consultants shall carry out consultations with Experts, NGOs, forest department and other selected Government Agencies and other stakeholders to (a) collect baseline information, (b) obtain a better understanding of the potential impacts and (c) appreciate the perspectives/concerns of the stakeholders, and (c) secure their active involvement during subsequent stages of the project as appropriate. Consultations shall be preceded by a systematic stakeholder analysis, which would

- identify the individual or stakeholder groups relevant to the project and to environmental issues
- include expert opinion and inputs
- determine the nature and scope of consultation with each type of stakeholders, and
- determine the methods to be used in contacting and consulting each type of stakeholders.

A systematic consultation plan with attendant schedules will be prepared for subsequent stages of project preparation as well as implementation and operation, as required. Consultant will prepare full documentation of the entire consultation process undertaken by them as well as all relevant consultations under taken by the implementation agency at the state level. The Consultant shall review the on-going consultation process being done by the state level implementing agency or its consultants with various stakeholders; identify further consultation required; and integrate those requirements in the on-going consultation process and/or carry additional consultation required.

c) Identification of Relevant Macro/Regional Level Environmental Issues

Consultants shall determine the Valued Environment Components (VECs) considering the baseline information (from both secondary and primary sources), the preliminary understanding of the activities proposed in the project and, most importantly, the stakeholder (and expert) consultations, which would need to be carefully documented. Use of iterative Delphi techniques is recommended. Based on the identification of VECs, Consultants shall identify information gaps to be filled, and conduct additional baseline surveys, including primary surveys. The consultants shall conduct analysis of the nature, scale and magnitude of the impacts that the project is likely to cause on the environment, especially on the identified VECs, and classify the same using established methods.

d) a plan to address the identified project and regional environmental issues

For the negative impacts identified, alternative mitigation/management options shall be examined, and the most appropriate ones suggested. The measures should be cost-effective, easy to implement by both the state implementing agency and the contractors – the consultant also need to review the experiences available worldwide and in India including the local knowledge available with the Central and state implementing agency.

The Consultant would also require reviewing the CPHEEO, MORTH, MoUD and other relevant specifications to identify as to what extent the construction related issues are already included in the specifications and if any further modification is required. The assessment should clearly identify aspects where the consultants shall also analyse indirect and cumulative impacts during all phases and activities of the project. For the positive measures identified, alternative and preferred enhancement measures shall be proposed.

The EA consultants shall make design recommendations, related to project interventions and alternatives including the location of project facilities, alignment of road / metro / BRT, alternative alignments, cross-sections, construction material use, and mitigation & enhancement measures. The EA consultants shall interact regularly with the Clients and familiarize themselves with the project's overall feasibility analyses models, so that the EA inputs are in conformity to the needs of the overall feasibility study (for all the different alternative improvement proposals under consideration).

In the cases of very significant environmental losses or benefits, the consultants shall estimate the economic/financial costs of environment damage and the economic/financial benefits the project is likely to cause. In the cases, the impacts or benefits are not too significant, qualitative methods could be used. In addition, wherever economic and financial costs of the environmental impacts cannot be satisfactorily estimated, or in the cases of significant irreversible environmental impacts, the consultants shall make recommendations to avoid generating such impacts.

e) a plan for building adequate environmental management capacity in the implementing agency (or Client)

Based on the findings of the environmental screening conducted as part of the earlier SEA studies, stakeholder consultations, and institutional analysis of the institutional capacity to manage environmental issues, consultants shall prepare a Capacity Building Plan to mainstream environmental management in the agencies activities by the end of project implementation period. Earmarking staff for environmental management and improving their skill-sets would be simultaneously pursued during project preparation and implementation. In addition, recommendations should be made concerning any changes to guidelines, standards and regulations, which would improve medium and long term environmental management in the implementing agency and the Line Departments' works within the overall capacity building plan of implementing agency and by integrating the study out-put with the bidding document to be used for implementation.

A training plan shall be prepared by the consultant to leave enough material for the regular use of the implementing agency which should ensure that they should be capable to prepare projects of its own which are of acceptable quality from the environment point of view. Under institutional

aspects the consultant should give how the implementing agency could expedite the statuary clearance from GOI in future. A detailed training plan shall be prepared, (a) to ensure that the environmental management framework can be implemented; and (b) to develop and strengthen environmental capacities in the implementing agency. The strategy should include a mix of hands-on training for key staff involved in project preparation, site visits to similar projects, and whenever required, full-fledged academic programs on environmental management at well-recognized institutions. The Consultants shall conduct training for the client at various levels to ensure that the knowledge, skills and perspectives gained during the current assignment are transferred to the Client and are utilized effectively during project implementation.

c) Environmental Management Plan

Based on suggestions of the EA, it is recommended to prepare separate EMPs for each subproject subjected to environmental assessment. Subprojects involving local, limited and construction level environmental issues identified using standard or pre-defined environmental screening checklists could be addressed through generic good engineering practices that were built into the construction codes. Special issues identified in the EA should be addressed through the management plan. For each of these issues, Consultants shall prepare a menu of alternative avoidance, mitigation, compensation, enhancement and mitigation measures. This could also be done through a careful review of the environmental management plans (EMPs) of the recent Bank-supported projects. Consultants shall organize consultations with the client and implementing agency before finalizing the EMP, its provisions and the budget.

The EMP should necessarily include but not limited to: (a) description of how feasible and appropriate mitigation and environmental enhancement measures would be identified and implemented; (b) institutional, training and monitoring requirements associated with the environmental impacts, mitigation measures and enhancements; and (c) effective monitoring, inspection and environmental auditing measures to be followed by the borrower; and, (d) the estimated budget for all the above, sufficiently detailed.

The environmental monitoring, inspection and audit shall specify parameters, the responsible agencies, reporting procedures, budget and financing, and what other inputs (for example: training) are necessary. In addition, the EMP shall specify what action should be taken and by whom in the event that the proposed mitigation measures fail, either partially or totally, to achieve the level of environmental protection expected. Consultants shall develop and agree with relevant Line Departments (such as the Forest Department) formats or prototypes of agreements or MoUs to be signed with the implementing agency to implement, monitor and report regularly on activities where the participation of the Line Departments is key to their successful implementation. Such activities include, but are not limited to, cutting of trees, shifting of community properties, roadside and compensatory plantation, etc.

d) Public Disclosure

The Consultants are to provide support and assistance to the client in meeting the disclosure requirements, which at the minimum shall meet the World Bank's policy on public disclosure. The consultants will prepare a plan for in-country disclosure, specifying the timing and locations; translate the key documents, such as the EA Summary in local language; draft the newspaper announcements for disclosure; and help the client to place all the EA/EMP reports in the client's

website. The consultants shall prepare a non-technical EA Summary Report for public disclosure including translation of the EA summary report in local language.

e) Co-ordination among the Engineering, Social, Environmental & Other Studies

The consultants, with assistance from the Client, shall establish a strong co-ordination with the other project-preparation studies – engineering, social and/or institutional development. The consultants shall keep in mind the specific requirements of the project in general, and the engineering/design studies in particular, and shall plan their outputs accordingly. It is recommended that some of the consultation sessions may be organised in co-ordination with the social and engineering consultants, as feasible, and when the stakeholders consulted are the same.

Annex – 8

TYPICAL TOR / SCOPE FOR SOCIAL ASSESSMENT IN SUTP

A) BACKGROUND

As one of the objective of SUTP being adoption of energy efficient modes of transport in the present urban scenario, various such alternatives are being explored and proposed as part of the SUTP. Consultations with the community in the urban area and PAP in particular are of paramount importance in undertaking projects of such nature. Any major concern that may arise during the implementation stage should be thought of and measures taken for their addressal in the project preparation phase itself. Project level decisions that may be necessary at this stage may as well be considered towards enabling energy efficient modes of transport being brought to the mainstream of implementation.

The social assessment document assists managers and leaders take conscious decisions to avoid social and resettlement impacts. SA in this context is seen as an impact assessment tool where the concerns to be addressed would go far beyond only social and resettlement issues. This would incorporate decision making tools to interface the scope of application of Project SA for identified sub-projects in the SUTP.

The SUTP being administered by the Government of India through the MoUD and concerned state governments, the SA so prepared would take into account the policy implications of the central and state governments apart from the resettlement policies and regulations of multilateral funding agencies that have agreed to fund the project. The SA would thus serve as a guidance manual for addressing environmental concerns at various levels of project conceptualization, planning and project preparation.

B) OBJECTIVE OF THE SERVICES

The main objective of Social Assessment (SA) is to ensure that the project design and implementation are socially acceptable. Further, the objective of SA shall be to provide inputs for selection of sub-projects, preliminary and detailed design of the project. The Resettlement Action Plans to be developed as part of the SA are to be used during the implementation of the project for executing the resettlement and rehabilitation activities and monitoring measures. In the preparation phase, the SA shall achieve the following objectives:

- Establish the Socio-economic conditions in the study area, and to identify any significant social issues;
- Assess impacts of the project, and provide for measures to address the adverse impacts by the provision of the requisite avoidance and/or compensation measures;
- Integrate the social and resettlement issues in the project planning and design; and
- Develop Resettlement Action Plan for implementing, monitoring and reporting of the social and resettlement compensation measures suggested.

C) SCOPE OF WORK

The SA shall comprise of 2 stages – (i) Social Assessments (SA) for the individual sub-projects, as required; and (ii) Resettlement Action Plan (RAP), Land Acquisition Plan (LAP) and Structure Acquisition Plan (SAP) for these individual sub-projects.

The social assessment shall be based on a census survey and will formulate development strategies in order to assist in determining project impacts on social, economic, cultural, and livelihood activities of potentially project-affected communities. This will establish a social baseline against which changes resulting from the intervention can be measured in the future. The social assessment studies and reporting requirements to be undertaken under these TOR must conform to the GOI and the Bank guidelines and regulations, which comprise of, inter alia: National Policy on Resettlement and Rehabilitation (NPRR) 2007, Land Acquisition Act, 1894 with subsequent amendments; the operational policies, guidelines and the reference materials of the World Bank.

The following section gives the detailed scope of work in each of these stages.

a) Inception

The Consultants shall use the inception period to familiarize with the project details. The Consultants shall recognize that the remaining aspects of the project, such as engineering and social, are being studied in parallel, and it is important for all these aspects to be integrated into the final project design to facilitate their successful implementation. The Consultants should also recognize that due care and diligence planned during the inception stage helps in improving the timing and quality of the SA reports.

During the inception period the Consultants shall (a) study all the project information to appreciate the context within which the SA should be carried-out, (b) identify the sources of secondary information on the project, on similar projects and on the project area, (c) carry out a reconnaissance survey in the urban areas where the subproject interventions are being undertaken, and (d) undertake preliminary consultations with selected stakeholders.

Following the site visits and stakeholder consultations, as well as a review of the conditions of contract between the consultant and the Client, the consultant shall analyse the adequacy of the allocated manpower, time and budgets and shall clearly bring out deviations, if any. The Consultants shall study the various available surveys, techniques, models and software in order to determine what would be the most appropriate in the context of this project on the basis of the best practice examples available with the Bank.

The Consultants shall interact with the environment consultants and engineering consultants to determine how the SA work fits into the overall project preparation cycle; how overlapping areas are to be jointly addressed; and to appropriately plan the timing of the deliverables of the SA process. These shall be succinctly documented in the Inception Report. The Consultant shall also specify what support and inputs the Consultant will require from and provide to the implementing agency, environment consultant and Engineering consultant.

b) Social Assessment (SA)

The SA shall identify all potential social issues in the project; and shall develop management measures for addressing all these issues. To this end, the SA shall consist of (i) Socio economic baseline established through census surveys; (ii) Stakeholder Identification & Consultation (iii) project and regional level social issues that would need to be considered in the analysis of alternatives, planning and design of the sub-projects and establish their criticality in the context of the proposed project; (iv) a Resettlement Action Plan to address the project and regional social

issues; (v) a training plan for building adequate capacity in the implementing agency (or Client) towards implementation of the plans produced. Key tasks in this part of the assignment include:

- Define likely project impact zone (direct/indirect) based on project proposal
- Collect information through desk review and field visits on existing baseline conditions, include all land uses, structures and people (e.g., demography, socio-economic status, vulnerability, status of infrastructure and access to people, livelihood programs, market rate of assets, medical support for sexually transmitted diseases, its prevalence, awareness on HIV/AIDS, legal status of land through revenue records.) within the likely project impact zone.
- Identification of key stakeholders involved in various aspects of the project (project implementing and executing agencies and groups from civil society; description of socio-economic organizations of local communities that may affect project outcomes; carry out public consultation with the likely affected groups, NGOs, district administration and other stakeholders and document the issues raised and outcomes; and assessment of local capacities in terms of participation in planning, implementation and supervision, and evaluation
- Explore viable alternative project designs to avoid, where feasible, or minimize social impacts (displacement, impact on vulnerable community, cultural properties etc.).
- Identify major and minor social impact issues including identification of congested areas, accident-prone zones, loss of assets, livelihood, poverty, gender and health issues and estimate the economic and social impacts on people and land.

c) Resettlement Action Plan

The RAP should fully confirm to all the requirements of the OP 4.12. This will include but not limited to the following tasks:

- Carry out specific consultation with likely affected population for proposed design alternatives, widening options and underpasses and for calculation of replacement cost.
- Visit all identified roads to develop strip map and indicate all information on structures, utilities and land use that is likely to be affected within the project impact zone.
- Information on legal ROW for linear projects and land tenure according to the revenue records;
- Conduct census survey to establish the cut-off date for eligibility criteria and also to establish the likely types of economic and social impact on people including on private land, traditional and customary rights, lease land, common property resources, different usage of legal right of way and livelihood.
- Assess and analyze social costs of all proposed design options.
- Assess various mitigation options available for addressing the adverse social impacts, and propose the most feasible option.
- Estimate a preliminary cost for broad mitigation options to address adverse impacts such as land acquisition, transfer and resettlement and rehabilitation and ensure inclusion in the overall project cost;
- Identify cases of likely impact on indigenous communities & magnitude of involuntary resettlement, to establish the applicability of GOI/State Government/Bank's requirements;
- To carry out market surveys to estimate replacement costs for loss of assets; and define method to arrive at replacement value.
- To carry out meaningful public consultation with project affected people and other stakeholders on (a) the types of R & R measures to ensure (i) that the proposed mitigation measures are feasible to assist people to improve their livelihoods and (ii) provide opportunities to participate in planning and implementing resettlement programs; and (b) on the various design options to avoid or minimize adverse impacts and design the mechanisms to minimize resettlement, to the extent possible.
- In accordance with the R&R policy of the respective states, finalise entitlement framework in close

coordination with the borrower, based on type of losses expected and mitigation measures needed to assist affected people, especially for the vulnerable in accordance with World Bank guidelines and national and state rules and legal framework.

- Prepare livelihood restoration plan for livelihood affected PAPs.
- Develop and test database for social impacts.
- Identify M&E indicators and develop Monitoring and reporting mechanism.
- Assess institutional capacity and propose the institutional arrangement for implementation of framework, addressing grievances, and ensuring gender equity, and identify the roles and responsibilities of each agency and monitoring & evaluating the compliance with the resettlement policy framework and tribal development strategy
- Develop monitoring indicators and formats for physical and financial progress, process monitoring and impact evaluation and indicators to ensure that the objectives of resettlement are achieved, and that child labour is not engaged in the project.
- Prepare an implementation schedule synchronized with time frame of civil works, and that ensures that no civil works will begin until people are fully compensated and adequately rehabilitated.
- Prepare terms of reference for (i) NGOs to implement RAP, (ii) external evaluation consultants for mid and end term evaluations, and (iii) or any other study identified for impact evaluation.
- Conduct risk assessment for proposed mitigation measures.
- Develop detailed budget based on the outcomes of the study.
- Prepare detailed guidelines to be used by the implementing agency staff and consultants to undertake social impact assessment of recurring sub-projects and
- Prepare a training plan for undertaking training session to prepare SIA and RAP

d) Sampling

The consultants should base his study on a representative sample of about 25% of Affected Persons for undertaking socio economic surveys for preparation of social baseline of the project area. All persons likely to be displaced and those partially affected should be consulted and census survey covering 100% of affected persons should be conducted. The sample for socio economic surveys should cover typical pockets of communities in the urban areas and also be representative of situations like roads passing through build-up areas, road crossings, road junctions, roads requiring major widening, road sections encroached by squatters, and others to capture the typical R&R issues involved. Consultant must included detailed sampling plan in the project proposal.

e) Instruments

The instruments to be used for the screening and detailed survey are provided below. However, these are indicative and consultant may provide component wise detailed instruments.

(a) Pre-tested quantitative schedule for social screening.

(b) Guidelines for conducting group discussions including those on HIV/AIDS

(c) Format for information to be collected on land records from revenue department.

(d) Pre-tested quantitative schedule to conduct census and baseline survey

(e) Plans at appropriate scales showing each affected property to identify all project affected households and assets.

(f) Formats and guidelines for consultations at district and state level.

(g) Develop database for Project Affected Households and people to enable monitoring.

Annex – 9

FORMAT FOR RESETTLEMENT ACTION PLAN

1.1 RAP Preparation

The National Policy for Resettlement and Rehabilitation clearly specifies the components of an R&R plan. The following paragraphs describe in detail the components of a resettlement plan.

1.1.1 IDENTIFICATION OF AFFECTED AREA

The first task is to identify the affected area due to the project. Towards this, an inventorisation of existing land available for the project is required to be done. While estimating the need for land acquisition, care should be taken to minimize acquisition of private properties to the extent possible. For this purpose, an inventory of government lands available in the project area or its immediate vicinity may be prepared. Table 4 gives the format for preparation of such an inventory.

Table 1: Format for Government Lands in Project Area

S.No	Locality Name	Survey No	Ownership (Specify Department)	Location with respect to Project Siting	Suitability for Project Purposes

Subsequent to the identification of the land, the same has to be notified in the official gazette. The notification would include area of villages/localities as an affected zone of the project. These areas are to be shown on the map as the affected zone. Also, the same shall be published in at least two daily newspapers with one of them being in Local language. The official notification is to be circulated in each of the affected villages on the notice board of the ULB and or prominent places in the affected zone. The next step is to conduct a socio-economic baseline survey of the affected persons. This is explained in detail in the subsequent sections.

1.1.2 BASELINE SURVEYS

Census and other baseline surveys are to be carried out for the purpose of preparation of the R&R Plan. The surveys shall be undertaken by the authority identified for the same. The surveys to be conducted include:

- Census survey of PAPs;
- Socio-economic survey of PAPs;
- Inventory of cultural properties;
- Inventory of common property resources.

Care should be taken to record the information of the PAPs with respect to categories. The categories of the PAPs are based on the type of loss. The major types of losses likely due to the projects include:

- Loss of Agricultural Land;
- Loss of Structure- Residential and Commercial; and
- Loss of Livelihood.

1.1.3 TIMELINE FOR CONDUCTING SURVEYS

The surveys shall be completed within a period of ninety days from the date of declaration. The survey details shall be published. After 30 days of publication of the draft of the details of the survey, final details of survey shall be submitted to the State Government. Within forty-five days from the date of receipt of the survey details, the State Government shall publish the final details of survey in the Official Gazette.

1.1.4 DRAFT SCHEME/PLAN FOR R&R

THE SOCIAL IMPACT ASSESSMENT SHALL INCLUDE THE ASSESSMENT OF IMPACTS ON THE FOLLOWING:

- Public and community properties;
- Assets and infrastructure, particularly roads, public transport, sanitation, sources of safe drinking water, sources of drinking water for cattle, community ponds, grazing land, plantations, public utilities, such as post offices, fair price shops, etc, food storage godowns, Electricity supply, health care facilities, schools and educational/training facilities, places of worship, land for traditional tribal institutions, burial and cremation grounds, etc.

The SIA report shall be examined by an independent multi-disciplinary expert group constituted for the purpose by the appropriate Government. Two non-official social science and rehabilitation experts, the secretary/secretaries of the department (s) concerned with the welfare of Scheduled Castes and Scheduled Tribes of the appropriate Government or representatives shall be nominated to be part of this expert group. The SIA clearance is mandatory for all projects.

1.1.5 DRAFT SCHEME/PLAN FOR R&R

After completion of base line survey and census of Project Affected Families and assessment of requirement of land for resettlement, a draft scheme/plan for the Resettlement & Rehabilitation of the Project Affected Families in consultation with representatives of Project Affected Families including women, ward councilors in cities, within which the Project area is situated would be prepared. Every draft scheme/Plan of resettlement and rehabilitation prepared is to contain the following information.

- **LAND ACQUISITION PLAN**

The land acquisition plan shall include the following details:

- Extent of land acquisition by village;
- Estimate of government and private land;
- List of titleholders and non-titleholder according to survey numbers and the land area to be acquired;
- Prepare list of PAPs to receive compensation'
- Timeline for land acquisition process; and
- Monitoring formats for land acquisition (filled at regular intervals).

- **SOCIO-ECONOMIC PROFILE**

A socio-economic profile of the affected persons is required to be done in order to ascertain the nature of impacts. The following information of the PAPs needs to be compiled:

- Number of family members by age and sex;

- Number of physically handicapped if any;
- Income level of the household to ascertain whether household is below or above poverty line;
- Whether the household belongs to vulnerable groups- scheduled caste, scheduled tribes, etc;
- Occupational status/type of the family especially the head of the household;
- Assets within the house/property.

❑ ENTITLEMENT FRAMEWORK

A list based on entitlement framework as given in Table 3 is to be prepared. The format for the same is given in Table 5.

Table 2: Entitlements

S.No.	Village Name	Name of PAP	Type of Loss*	Entitlement (Amount)		Total Amount to be given
				Compensation	Assistance	

Note: * Categories include loss of agricultural land, loss of non-agricultural land, loss of residential structure, loss of commercial structure, loss of institutional structure

❑ CONSULTATION PLAN

A consultation plan has to be attached in the R&R report. The R&R report should include the minutes of such meetings held. The format for recording the consultation sessions has been given in Table 6. The stages at which the consultations are to be conducted are given in section on *stakeholder participation and consultation*.

Table 3: Format for Recording Consultations

S.No.	Village Name	Date of Meeting	Stakeholder's Present*	Issues Discussed

*Note: * Attach a list of stakeholder names along with signatures*

❑ RELOCATION PLAN FOR CPRS AND CULTURAL PROPERTY

The relocation plan for the common property resources and cultural property shall be based on consultations with the local community. Based on discussions with the community, a consensus need to be arrived at with respect to the following:

- Classification of properties needing relocation and enhancement;
- Identification of land for relocation, preferably within the village;
- Finalizing the design for the relocation as well as enhancement of the property;
- Estimation of the costs involved.

The above information need to be compiled for every cultural and common property and is to be included as part of the R&R plan.

Annex – 10

TYPICAL REPORTING SYSTEM FOR EMP AND RAP IN SUTP

A) EMP Reporting System

Format 1: Target Sheet for Pollution Monitoring

Construction Stage: Report - Date_____ Month_____ Year_____

(Locations at which monitoring to be conducted as per EMP)

Sl. No	Chainage	Details of Location	Duration of Monitoring	Instruments Used	Completion Target		Reason for Delay if any
					Target Date	Date of Completion if task completed	
Air Monitoring							
1							
2							
3							
4							
5							
Water Monitoring							
1							
2							
3							
4							
5							
Noise Monitoring							
1							
2							
3							
4							
5							

Certified that the Pollution Monitoring has been conducted at all the locations specified in the EMP and as per the directions of the CSC

Contractor

Project Engineer

(Supervision Consultant)

Format 2: Tree Plantation and Landscaping

Post Construction Stage: Report -Date____ Month_____ Year_____

Sl. No	Activity	Physical Target						Financial Target			Completion Target		
		Target (tree/shrubs to be planted in Package) for this Quarter			Target Achieved		% of task completed	Total (lakhs)	Budget Spent	% used	Target Date	Date of Completion/% completed	Reason for Delay if any
		unit			No. of Trees	Survival Rate (%)							
1	Tree Plantation along roadside	km-km											
2	Landscaping of Road Junctions	Nos.											
3	Plantation at Incidental Spaces	Nos.											
4	Plantation at Locations identified for enhancement	Nos.											

Certified that the above information is correct

PIU / Implementing Agency

(B) RAP Reporting System

Format 1: Verification of land to be Acquired

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Agricultural Land (Sq. M)*	Residential Land (Sq. M)	Commercial Land (Sq. M)	Department Land (Sq. M)	Total Land to be Acquired (Sq. M)

Representative of Revenue Department

Environment and Social Officer, PIU

*Note: * Agricultural land so as to cover the presence of any form of urban agriculture present in the project cities.*

Format 2: Status of Land Acquisition

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Name of owner	Type of land (Rese/Comm/Agri*/ department/indust)	Date of publication of section 6 of LA Act	Date of declaration of award	Date of compensation amount transferred	Date of possession taken

Representative of Revenue Department

Environment and Social Officer, PIU

*Note: * Agricultural land so as to cover the presence of any form of urban agriculture present in the project cities.*

Format 3: Progress on Census Survey

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Name of owner	Date of conduct of census survey	Type of loss

Environment and
Social Officer, PIU

Format 4: Progress on Socio-Economic Survey

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Name of owner	Date of conduct of socio-economic survey	Type of loss

Environment and
Social Officer, PIU

Format 5: Verification of PDFs

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Name of Head of household	Number of family members

Environment and
Social Officer, PIU

Format 6: Verification of Squatters

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Type of structure (residential /commercial)	Name of PAP

Environment and
Social Officer, PIU

Format 7: Verification of Encroachers

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Type of structure (agricultural*/residential /commercial)	Name of PAP

Environment and
Social Officer, PIU

*Note: * Agricultural land so as to cover the presence of any form of urban agriculture present in the project cities.*

Format 8: Distribution of Entitlements and Assistances

Report - Date_____ Month_____ Year_____

S.No.	Survey No	Name of PAP	Total amount	Replacement cost	Replacement cost	Replacement cost of crops	Assistance for land	Assistance for	Assistance for livelihood	Signature of PAP	Date

Environment and
Social Officer, PIU

Format 9: Progress of Relocation of CPRs

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Type of CPR	Land Loss (Sq. Mts)	Structure Lost (Sq. Mts)	Construction completion date	Photograph of new structure

Environment and
Social Officer, PIU

Format 10: Progress of Relocation of Cultural Property

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Type of cultural property	Land Loss (Sq. Mts)	Structure Lost (Sq. Mts)	Construction completion date	Photograph of new structure

Environment and Social Officer, PIU

Format 11: Progress of Relocation and Site Clearance

Report - Date_____ Month_____ Year_____

S.No.	Survey No.	Locality Name	Name of Head of household of PDF	Relocation site allotted	Construction completion date at relocation site	Dare of relocation	Date of Physical possession taken	Site Clearance date

Environment and Social Officer, PIU

Format 12: Community Consultations

Report - Date_____ Month_____ Year_____

S.No.	Date of consultations	Number of People Attended*	Issues Raised	Adderssal of Issues	Remarks

Environment and Social Officer, PIU

Note: *: Attached a signature list of people who attended the community consultations

Format 13: Progress of Grievance Redressal

Report - Date_____ Month_____ Year_____

S.No.	Locality	Name of Applicant	Date of grievance received	Issues	Judgement made	Vide GRC meeting date	Persons present

Environment and Social Officer, PIU

Annexure – 11: PIU Setup in the project cities

S. No	City	Post	Name	Email / Phone
1	Ajmer	Project Manager	Mr.B.L.Soni, Exe, Engr, AMC	9929607699
		Transport Specialist	-	
		Environment Officer	Ms.Babita Singh	
		Social Officer	Mr. Vivek Sharma	
		Finance Officer	Mr. J.P.Chejara, AMC Fin. officer	
		Procurement Officer	-	
2	Ahmedabad	Project Manager	Mr. Chirag Panchal, Asst. Manager, BRTS	jnnurm@egovamc.com, 9327555225
		Transport Specialist	Ms.Deepaben Dave	9376984897
		Environmental Officer	Ms. Dhartiben A. Acharya	079 27551861
		Social Officer	Ms. Shilpaben R. Patel	9925024968
		Finance Officer	Mr. Jaswantbhai Shah, officer	079 27551861
		Procurement Officer	Mr. Nitinkumar B. Solanki	9909712096
3	Hyderabad	Project Manager	G.V Ramesh Kumar	9704990961
		Transport Specialist	M.A Sukur	9849165974
		Env./Social Officer	G. Krishna Murthy	9849028506
		Finance Officer	Partha Sarathi	9963199984
		Procurement Officer	D. Anand Rao	9704670170
4	Indore	Project Manager	Mr. S.C.Garg, Technical Advusor, ICTSL	scgarg@citybusindore.com 09425060744
		Transport Specialist		
		Env./Social Officer		
		Finance Officer	Shri Tryambak Sonawane	
		Procurement Officer		
5	Jalandhar	Project Manager	Rahul Gupta, Joint. Commissioner, M.C. J	rahulgupta1914@hotmail.com, 9872888848
		Transport Specialist	V.P. Singh Superintending Engineer (O&M), M.C.J -	9915902828
		Env./Social Officer	Dr. J.S Bilga Corporation Engineer (Hort),M.C.J	sanghera_js@yahoo.com, 9814217069
		Finance Officer	Ravinder Singh, DCFA	9814197853
		Procurement Officer	Kulwinder Singh S.E.	
6	Mysore	Project Manager	Mr. Anand, Chief Mechanical Engineer, KSRTC	anandksrtc@gmail.com, 9980915008
		Transport Specialist	-	
		Env./Social Officer	Mr. P.S.Anandrao, Mech. Engineer.(Env.)	
		Finance Officer	Ms. M.N. Gayatri, Accounts officer	
		Procurement Officer	Mr. Mahadev Prasad, Stores officer	
7	Naya Raipur	Project Manager	Mr. L.K.Panigrahi (GM,Project)	lk_panigrahi@yahoo.com, 9425257357
		Transport Specialist	-	
		Env./Social Officer	Mr. J.P.Sharma (Manager, Env.)	

S. No	City	Post	Name	Email / Phone
		Finance Officer	Mr. P.C. Jain (Manager, Finance)	
		Procurement Officer	Mr. A.R. Gupta (Asst. Engineer)	
8	Pune	Project Manager:	Mr. Vivek Kharwadkar, Addl. City Engineer (Roads)	Vivek.kharwadkar@punecorporation.org , 9823073634
		Transport Specialist	Mr. Srinivas Bonala, Addl. City Engineer (project)	
		Env./Social Officer	Dr. Ajay Ojha, Manager, AQM Cell	
		Finance Officer	Mr. Virendra Jadhavrao, Chief Accountant	
		Procurement Officer	Mr. Surendra Karpe, Junior Engineer	
9	Trivandrum	Project Manager	Ms. Lalithambika, Project Superintending Engineer (Corporation)	piutvmksudp@gmail.com 0471-2332858, 9946487907
		Transport Specialist	-	
		Environment Officer	Ms.P.Geena Prasad, Tech. officer (env.)	0471-2331570, 9946487935
		Social Officer	Ms. P. Indu, Social development officer	0471-2331570, 9946487933
		Finance Officer	Ms. R.Rajit, Accounts manager	0471-2331570, 9946487914
		Procurement Officer	Mr. S. Krishnakumar, Technical officer	0471-2331570, 9946487934
10	Pimpri Chinchwad	Project Manager	Mr. Eknath Ugile, City Engineer	
		Financial expert	Mr. Nilkanth Londhe, Chief Account Officer	
		Procument expart	Mr. Mhaveer Kamble, Executive Engineer	
		Environmental Expe rt	Dr. Kuchnagi Nagkumar, Chief Health & Medical Officer	
		Social Expert	Mr. Sudhir Joshi, Asst. Commissioner	
		Transport expert	Mr. Ajiz Karche, Joint Managing Director	

Annexure – 12: Guidelines for Occupational Safety and Health Hazards

A large number of construction workers are vulnerable to accidents and occupational health problems at workplace. They are exposed to a wide variety of serious OSH hazards as exposure to hazardous substances, which have a potential to cause serious occupational diseases such as asbestosis, silicosis, lead poisoning etc. There is also a serious potential for fires due to storage and use of flammable substances and a potential for disasters due to collapse of the structures and subsidence of the soil on which the construction activity is being carried. The Building and other Construction Workers (Regulation for Employment and Conditions of Service) Act, 1996 was promulgated in 1996 and Central Rules under this Act were notified in 1998 by Kerala, Karnataka and Delhi in 2002. Hence, for the project cities of Trivandrum and Mysore these rules will be followed by the contractor. In case of other project cities the contractor should prepare a Safety Manual in line with the above said act and enforce the same. A summary of practical guidelines that would be required to be incorporated in these documents are presented briefly in the following sections.

Given the nature of work as erection of electrical installations, sign boards and building construction in Ahmedabad, Indore and Mysore, the safety measures that need to be undertaken at are mentioned in Section 12-1 below. In other cities where there is extensive construction works in multiple levels and involves handling of various hazardous and flammable materials as bitumen and fuels the safety measures that are to be followed are presented in Section 12-2.

All workmen should in general be provided with a Personal Protective Kit as it plays a vital role in protecting workmen from injury while executing the work. Some of the safety kits are listed below.

- Safety helmets – for use in work sites where is in progress at different levels
- Safety belts – used by those working at a height, as working on buildings, electric poles etc..
- Hand gloves – used for material handling, gas cutter, welding machine, electric installations etc.
- Safety goggles – used for gas welling, grinding, pavement breaking etc
- Gum boots – used where contact with concrete, bitumen or any other chemical substances are likely to be in contact with skin

12.1 Occupational Safety Measures in Ahmedabad, Indore and Mysore

1. Protection from Sharp Objects: Every worker engaged in handling sharp objects or materials at construction work which may cause hand injury, shall be provided with suitable hand-gloves.

2. Electrical hazards: Before commencement of construction work, the Contractor shall take adequate measures to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment in the construction work.

3. Warning Signs: The Contractor shall display and maintain warning signs of presence of men at work site, presence of live electrical wires, diversion / slow movement of traffic at conspicuous places at construction work in Hindi and in a local language understood by the majority of the workers.

4. Excavation works: In workplaces where the exact location of underground electric power line is not known, the workers using jack hammers, crow bars or other hand-tools which may come in contact with a live electrical line, shall be provided by the contractor with insulated protective gloves and foot-wear.

5. Protection from Water: The Contractor shall ensure that, as far as practicable, no wiring, which may come in contact with water or which may be mechanically damaged, is left on ground or floor at construction site.

6. Earthing: The Contractor shall ensure that all temporary electrical installations at the construction site are provided with earth-leakage circuit breakers.

7. Vehicular Traffic: Whenever construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to the workers or the traffic, the Contractor shall ensure that such construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger.

12.2 Occupational Safety Measures in Construction Sites

1. Noise: The contractor will ensure at construction site that adequate measures are taken to protect workers against the harmful effects of excessive noise or vibration and the noise level in no case exceeds the limits laid down in table below.

Permissible exposure in cases of continuous noise

Total time of exposure (continuous or a number of short-term exposures) per day (in hours) (1)	Sound pressure level (in dBA) (2)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
3/4	107
1/2	110
1/4	115

Notes. - 1. No exposure in excess of 115 dBA is to be permitted.

2. For any period of exposure falling in between any figure and the next higher or lower figure as indicated in column (1), the permissible sound pressure level is to be determined by extrapolation on a proportionate basis.

2. Lifting and carrying of excessive weight: .- The contractor shall ensure that at construction site no worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight the maximum limits set out in the following table:

Person	Weight
Adult -man	55 kg
Adult -female	30 kg
Adolescent - male (15-18 years)	30 kg
Adolescent - female (- do -)	20 kg
Young person-male (14-15 years)	16 kg
Young person-female (- do -)	14 kg

3. Exposure to Exhaust Fumes: When an internal combustion engine exhausts into a confined space or excavation or tunnel or any other workplace where neither natural ventilation nor artificial ventilation system is adequate to keep the carbon monoxide content of the atmosphere below fifty parts per million, adequate and suitable measures are taken at such workplace in order to avoid exposure of the workers to health hazards;

4. Cordoning off Construction Site: The Contractor shall ensure at the construction site that any area exposed to risk of falling material, articles or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of persons other than the workers at work in such area. All such workers should be provided with Safety Helmets to prevent injury from falling objects.

5. Protection from Machinery.- The contractor shall ensure at a construction site that all motors, cogwheels, chains, and friction gearing, flywheels, shaftings, dangerous and moving parts of machinery (whether or not driven by mechanical power) and steam pipes are securely fenced or lagged; and that the fencing of dangerous parts of machinery is not removed while such machinery is in motion or in use; Also, no part of any machinery which is in motion and which is not securely fenced is examined, lubricated, adjusted or repaired except by a person skilled for such examination, lubrication, adjustment or repairs; No machine parts are cleaned when such machine is stopped; When a machine is stopped for servicing or repairs, adequate measures are taken to ensure that such machine does not re-start inadvertently.

6. Fire protection: The Contractor shall ensure at construction site that it is provided with:

(i) Fire extinguishing equipment sufficient to extinguish any probable fire at such construction site;
(ii) An adequate water supply at ample pressure as per national standards;
(iii) Number of trained persons required to operate the fire extinguishing equipment provided

The contractor shall also ensure that fire extinguishing equipment provided is properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspections is maintained;

7. Slipping and Tripping: The Contractor shall ensure that all passageways, platforms and other places of construction work will be kept free from accumulations of dust, debris, oil, grease, water or similar material and from other obstructions that may cause tripping.

8. Eye Protection: The Contractor shall provide suitable personal protective equipment for the protection of eyes and used by the worker engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes at the construction work.

9. Protection from water: Every worker required to work in water or in wet concrete or in other similar construction work, shall be provided with suitable water-proof boots. Similarly, workers required to work in rain or in similar wet conditions, shall be provided with water-proof coat with hat by the Contractor.

10. Protection from Sharp Objects: Every worker engaged in handling sharp objects or materials at construction work which may cause hand injury, shall be provided with suitable hand-gloves.

11. Vehicular Traffic: Whenever construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to the workers or the traffic, the Contractor shall ensure that such construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger.

Annex – 13: Suggested Training Modules Environment and Social Management

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
A. Pre-Construction Stage					
Sensitization Workshop	**Introduction to Environment:** • Basic Concept of environment • Environmental Regulations and Statutory requirements as per Government of India and World Bank **Introduction to Social and Resettlement Aspects** • Basic Concepts • Policy, legal and other Statutory requirements as per Government of India and World Bank	Secretaries, Chief Engineer Superintending Engineers of Implementing Agency and Project Director (PD) and Environmental Officer (EO) of the PMU	Workshop	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building
Session I					
Module I	**Introduction to Environment:** • Basic Concept of environment • Environmental Regulations and Statutory requirements as per Government of India and World Bank **Introduction to Social and Resettlement Aspects:** • Basic Concepts • Policy, legal and other Statutory requirements as per Government of India and World Bank	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture	¼ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building
Module II	**Environmental Considerations in Urban Development Projects:** • Environmental components affected by urban development in construction and operation stages • Activities causing pollution during construction and operation stages • Environmental Management Good Practices in Urban Infrastructure Projects **Social & Resettlement Considerations in Urban Development Projects:** • Social and Resettlement aspects arising during construction and operation stages • Social and Resettlement Good Practices in Urban Infrastructure Projects	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Workshop	¼ Working Day	Environmental Specialist of Design consultant / external agency engaged for capacity building
Module III	**Review of EIA/IEE and its Integration into Designs:** • EIA/IEE Methodology • Environmental Provisions in SUTP	Engineers of Implementing agency, PMU and PIU (Technical Unit	Lecture and Field Visit	½ Working Day	Environmental & Social Specialists of Design

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	• Implementation Arrangements • Methodology of Assessment of Pollution Monitoring • Methodology for site selection of borrow areas, waste disposal areas etc. **Review of SIA/RAP and its Integration into Designs:** • SIA/RAP Methodology • Entitlements in SUTP • Implementation Arrangements • Methodology of Assessment of Affected Properties • Methodology for compensation, resettlement site selection etc.	including the EO & SO)			consultant / external agency engaged for capacity building
Module IV	**Improved Co-ordination with other Departments:** • Overview of SUTP • Environmental & Social Impacts • Statutory Permissions – Procedural Requirements • Co-operation & Co-ordination with other Departments	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture / Interactive Sessions	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building
Module V	**Special Issues in SUTP:** • Cultural properties in urban areas • Squatters and encroachers • Protection of Water bodies • Protection of roadside plantations • Statutory Permissions – Procedural Requirements • Consultation and Counseling	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building
B. Construction Stage					
Session II					
Module VI	**Role during Construction** • Roles and Responsibilities of officials/ contractors/ consultants towards protection of environment and resettlement • Implementation Arrangements • Monitoring mechanisms	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture / Interactive Sessions	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building
Module VII	**Monitoring and Reporting System**	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture / Interactive Sessions	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
					building

Annex - 14: Comments on ESMF and Their Addressal

Sl. No.	Comment	Response
A. Comments from Quality Enhancement Review of the World Bank, Received Nov 12, 2008		
1	The E&S framework is a short, generic document of a few pages at this stage.	Specific information on the Cities is presented in the relevant sections of the report as mentioned below.
2	Clearly we need to have a city-by-city list of Bank-financed sub-projects for which each city has an administrative set up to manage E&S aspects.	City by City list of sub-projects provided in Chapter 3. Administrative setup for management of the bank financed subprojects is in place and presented in the Annexure - 11
3	At the city level, the E&S document should provide specifics of sub-projects for each of the 9 cities, and describe salient environmental and social impacts anticipated, mitigation, monitoring and closure criteria should be given for each.	The Table 5-1 presents list of sub-projects at the city level. Anticipated mitigation and management measures are presented in Annexure 6
4	The E&S framework should also provide a process map for each city which shows how E&S aspects are managed throughout. This process should include the stages of consultations pre-, during, and at project closure.	Process map provided in Chapter 7, Figures 7-1 and 7-2.
5	Given that there is potential to disrupt businesses and livelihoods, both legal and informal and also potential to displace encroachers, squatters, and the like; it must be made a clear condition that no work can be initiated until such people are adequately accommodated / assisted. While numbers may be small, this is a good opportunity to develop and refine methods for urban resettlement and economic displacement which may serve well in future and in larger projects.	Included in section 7.1 and also in Annexure 6.
6	Effective and well timed consultations will be an important part as will early identification and documentation of such cases to control speculation. In addition a fair and effective grievance redressal system should be put in place at the city level.	Consultants preparing the DPR are advised to conduct the consultations as per the Participation and Consultation Framework
7	This city-by-city documentation should provide strip or local area maps which adequately describe the area and all relevant features.	The consultants are advised to prepare the maps as desired. Maps available so far are presented in Chapter 3.
8	Occupational health and safety aspects for construction are not covered in the document. Some practical guidelines for this are needed for each city operation.	This is provided as Annexure 12 for the document.
9	At this stage, city-by-city documentation will be needed at least for the Phase I cities (These are Ahmedabad, Hyderabad, Indore, Mysore, and Pune).	The documents are under preparation by the respective consultants of the cities.
B. Comments from Project Cities		
i. Ahmedabad		
1.	No Comments	
ii. Ajmer		
1.	No Comments	

Sl. No.	Comment	Response
iii. Hyderabad		
1.	The entitlement framework is generic and is not specially addressing the entitlement in livelihood issues etc between titleholders & Non titleholders.	Entitlement Matrix modified to reflect specific entitlements for titleholders and non titleholders
2.	With regard to section 6.3 as specified may be revised as all utilities and common property resources likely to be affected due to the project will be relocated with prior approval of the concerned agencies, before start of construction or during the Construction for utilities which are underground.	The relevant section is modified as suggested
3.	The document is not clear on the Funding pattern for capacity Building & training which has been specified in section 7.6 & also the fund distribution for the total budget indicated for ESMF between the GEF/World bank, Centre, State & the Urban Local Body (GHMC in the present case).	The ULB needs to decide on the fund distribution amongst the funding agencies and presented in their DPR
iv. Indore		
1.	Table 5-1 page 28—Acquisition of land is not involved as such there would be no R&R issues.	Noted. Process Map prepared for implementation of ESMF has taken care of the comment.
2.	Environmental and social officer of PIU - page 94 Environmental and Social issues will not be involved as such. Environmental and social officer at PIU level will not be required.	Noted. Process Map prepared for implementation of ESMF has taken care of the comment.
v. Jalandhar		
	No Comments	
vi. Mysore		
	No Comments	
vii. Naya Raipur		
	Not Received	
viii. Pune		
1.	No Comments	
ix. Pimpri – Chinchwad		
	Not Received	
x. Trivandrum		
1	Reference section (B) of Annexure-2, page-5, Sl. No. A4.0 **Activity and Sub activity** - Clearance of land; **Impacts** - Affect on livelihood; **Measures**-As per project provisions − **will be addressed in the DPR in line with ESMF and the State Policy.**	Accepted. Has been modified as suggested.
2	Reference section (B) of Annexure-2, page-5, Sl. No. A6.0 **Activity and Sub activity**-Transfer of land ownership; **Impacts**-Grievances from community; **Measures**-Addressal through Grievance Redressal Mechanisms and Consultations − **the state has in place a grievance redressal mechanism based on consultations with affected parties, applied in already implemented/under implementation projects, which will be used with any necessary**	Accepted. Has been modified as suggested.

Sl. No.	Comment	Response
	modifications due to the WB ESMF.	
3	Reference section (B) of Annexure-2, page-5, Sl. No. A7.0, A8.0, A9.0 & A10.0 **Measures – to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.**	Noted. Annexure – 6 provides the contract clauses to be built into the procurement documents.
4	Reference section (B) of Annexure-2, page- 5 to 7, Sl. No. B8.0; **Measures – to be inbuilt in the contract clauses of procurement documents to satisfy WB ESMF stipulations.**	Noted. Annexure – 6 provides the contract clauses to be built into the procurement documents.
5	Reference section (C) of Annexure-2, page-7, Sl. No.1; **Activity-**Preliminary project information; **Items to consider-(i)** Estimate likely number of loss - **to be included in the Interim Report (Stage II of VII for Phase 1 corridors and Stage II of VIII for Phase 2 corridors).**	Noted. Statement indicating stage of reporting will be added.
6	Reference section (C) of Annexure-2, page-7 to 8, Sl. No.2, 4,6 & 7; **Activity-**Detailed surveys; **Items to consider-(i)** Census survey, Socio economic survey, Cultural property surveys and Common property resources – Reference section (C) of Annexure-2, page-7, Sl. No.1; **Activity-**Preliminary project information: **Items to consider-(i)** Estimate likely number of loss – **to be included in the EIA Report & Draft DPR (Stage-III of VII for Phase 1 corridors and Stage III of VIII for Phase 2 corridors).**	EIA and other documents are considered to be integral part of the DPR.
7	Reference section (D) of Annexure-2, page- 8 & 9, Sl. No. A, B & C; **Activity and Sub Activity; Impacts: and Measures** – all to be covered in **(Stage III of VII for Phase 1 corridors and Stage III of VIII for Phase 2 corridors).**	Staging may be considered as appropriate by the respective states implementing the project. However prior to finalizing the impacts it is necessary to finalise the design, which will be possible at DPR stage. However as far as reporting is concerned, the DPR should contain all the items mentioned in the checklist
8	Annexure 3 and 4 would be addressed through the stages of submission as appropriate to each stage starting from Stage II of the submissions	Noted
9	Annexure 5 and 6 would be addressed as per requirements of detail for the project through stages 2 to 4 and in the Procurement Documents.	Noted
10	Annexure 7 and 8 being detailed versions of the contents of TOR in place through the Agreement already entered, would get addressed through the stages 2 to 4	These are for reference of implementing agencies. Any items not reflected in the ToRs already prepared may need to be amended to be in line with these provisions
11	Resettlement, as contained in Annexure 9 will be addressed as per consultation outcomes and state policy and would be finalized in Stage 4	If the state policy is formulated in line with the requirements of World Bank funded projects, this policy can be adopted as Annexure 9 is

Sl. No.	Comment	Response
		designed to be in line with the WB R&R policy
12	Annexure 10 will be addressed in the course of detailing of the project being the standardized formats to previous Annexure.	Noted.
C. Comments from MoUD		
1.	Change of Date of the document from September 2008	Changed to February 2009
2.	Remove Table A on addressal of comments of QER	Removed from the Main document and incorporated as Annexure 14
3.	Confirm whether Naya Raipur is in Phase I and remove any references from the document as appropriate	Naya Raipur is decided to be Phase II. All references indicating it to be in Phase I are modified appropriately
4.	Consider adding 'while adhering to the national and state level policies' in the Chapter 2 introduction paragraph	Added as advised
5.	Does this para (Policy and Legal framework in Chapter 2) need to be cleared by GOI (MoUD). Or is it a standard document, published or on web site	It is clarified that stands cleared when ESMF is cleared. No specific clearance is required. This is as per the prevailing legal provisions of the country / state.
6.	How this has been checked (Applicability of MoEF EIA Notification September 2006 as per Implications for GEF, section 2.4 chapter 2)	This is checked as per the list of project types provided in the schedule of the notification
7.	GEF OP11 references to be removed	Removed throughout the document as suggested.
8.	Chapter 4, Introduction Paragraph, Is it nine or ten cities?	This still stands to be clarified by MoUD
9.	Section 6.3, Chapter 6, Clarify CoI	Definition of CoI is added as a footnote
10.	PMC indicated in Figure 7-1 to be explained	The figure 7-1 and its items are appropriately described in the section 7.1, initial paragraphs
11.	Institutional Arrangements, Section 7.2, These details are already available in Operations Manual. Why are they required here. If at all, only portion relevant to EI/SI may be given.	Institutional arrangements are discussed with respect to Operations manual with specific reference to Environment and Social requirements.
12.	The scope of Environment and Social Officers as per section 7.2.1, Are they in conformity with those given in TOR for PMC?	The section 7.2 is modified completely to reflect the qualifications of the officers recommended for EA/SA in line with the Operations Manual and as per discussions with MoUD and the World Bank dated Feb 9, 2009
13.	Section 7.3.2, Information Disclosure, MoUD role in Information disclosure as component 2 is state subject to be revisited	The Information Disclosure in Section 7.3.2 and Disclosure Policy, Section 7.3.2.1 has been discussed with MoUD and The World Bank dated Feb 9, 2009 and accordingly modified.

Sl. No.	Comment	Response
14.	Reference to MoUD and PMU (in table 7-1) does not seem to be relevant and may be removed. – TO BE DISCUSSED	This table has been discussed and reference to MoUD and PMU are modified as appropriate. Modifications to the table is yet to be approved by MoUD
15.	Table 7-2, Mechanism for Monitoring R&R activities. Frequency of monthly and quarterly seem to be too frequent. If PMU has to monitor it should be included in TOR for technical audit.	Monitoring frequency has been revisited in consultation with the World Bank and MoUD and modified accordingly. Reference to PMU is erroneous and has been modified as PIU.
16.	Section 7.5, Grievance Redressal Mechanism. This (R&R Committee) should be required only where land acquisition is involved. Constitution of Committee to be discussed. Convener and Chairperson of the Committee may also be indicated.	The committee constitution has been modified as discussed with the World Bank and MoUD on Feb 9, 2009. Accordingly this section is modified as presented.
17.	Section 7.6, Capacity Building and Training to be discussed	This section has been discussed with MoUD and the World Bank. As per suggestions of the MoUD, the training for environmental and social management will not be included in Component 1 but will be dealt with separately through independent training sessions. This is modified in the section accordingly. The details of the training sessions were requested to be provided as Annexure. Accordingly, this is provided as Annexure 13 instead of putting up as a Table in the main document.
17.	This aspect (Section 7.7, GHG Benefits of GEF-SUTP) is already covered in OM. May not be duplicated here.	This is included in the ESMF as to cover the range of aspects for environmental aspects
18.	Budget for ESMF - To be discussed. Has this budget been included in the cost of project as reflected in DPRs	The DPR for Hyderabad in Phase I has added costs for environmental management. Rest of the cities are requested to add the cost in the DPR. – MoUD is yet to approve this section