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GEF

GEF/WORLD BANK/UNDP – SUTP, India

Environment and Social Management Framework

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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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1.1 INTRODUCTION

To encourage application of the National Urban Transport Policy and achieve a paradigm shift in India's urban transport systems in favor of sustainable development, the GOI has applied to the Global Environmental Facility (GEF) under their operational program OP11 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 US$ 200 million co-financing from the World Bank. The project will be implemented over a four-year period, starting from 2008.

This Environmental and Social Management Framework 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 selected3 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 center 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**.

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[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 9 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 OP 11 Priorities				
		Public transport improvement	Non-Motorized Transport	Integrated land-use and transport system	ITS application	City center improvement
Ajmer-Pushkar	Rajasthan		X			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 / Pimpri - Chinchwad	Maharashtra		X			
Thiruvananthapuram	Kerala		X			

Ahmedabad, Hyderabad, Mysore and Naya Raipur 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
	Others	Around MMTS Stations
	Incentivizing multi-modal travel	
	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	
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

City	Component	Subcomponent/Location
	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
	Transit Oriented Development	

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 manages 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 to implementation and operation stage. The framework encourages participatory approach to preparation of sub-projects in respective cities. 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.

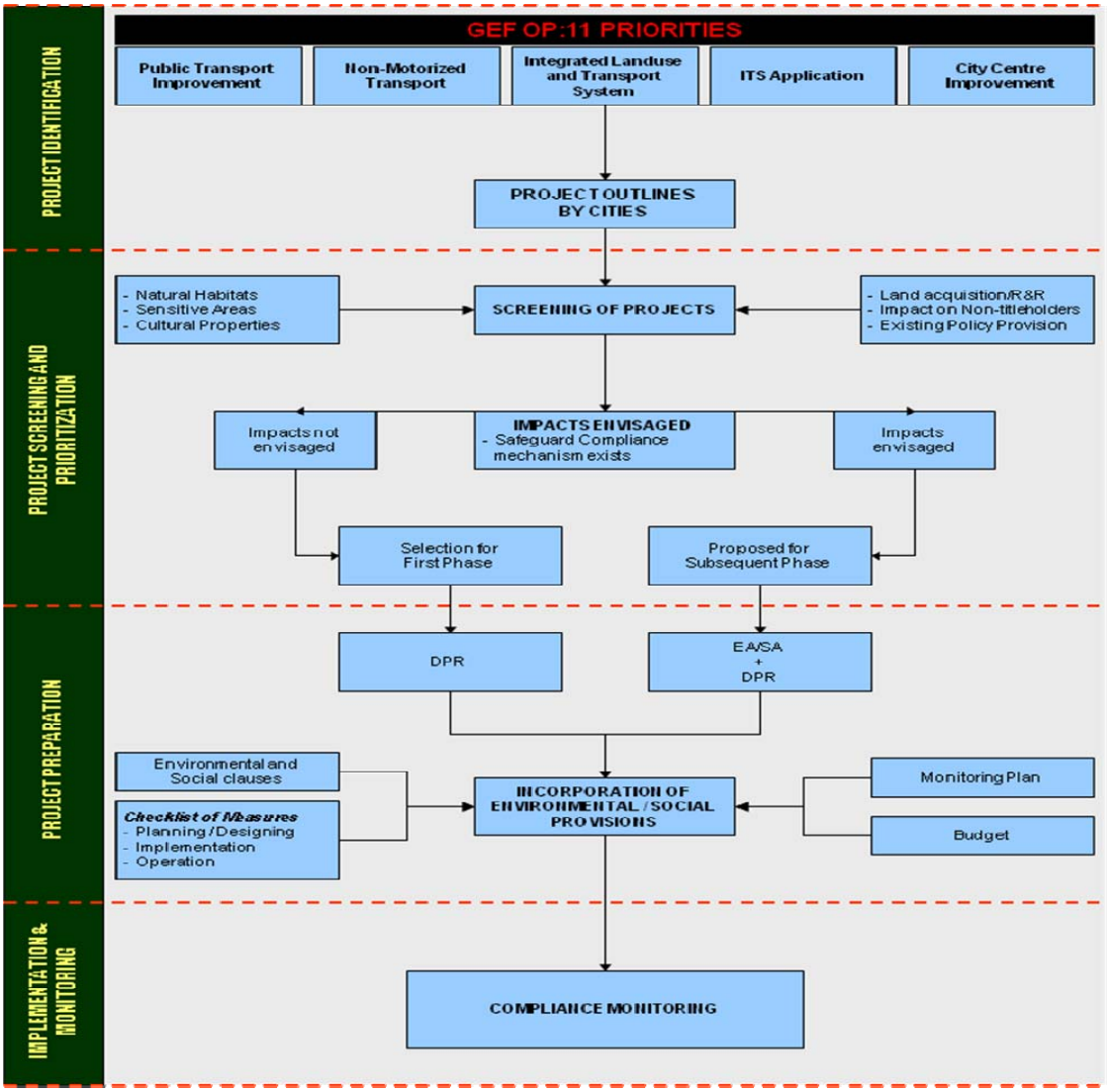

Figure 1-1: ESMF Implementation Process

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 to be adhered to to conform to the provisions of the ESMF.

Projects triggering significant environmental / social impacts, i.e. projects with potential to trigger impacts on environmental 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 OP 11 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 7-1**. The criteria established as per the Checklist of items in **Annex – 2** shall enable the identification of such projects and are suggested for inclusion in the second and subsequent phases of the project. This would enable not only the 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.

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 center 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);
- Forestry (OP/BP 4.36); and
- 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, Involuntary Resettlement will be applicable in sub-projects involving civil construction activities and removal squatters / encroachers.

Amongst the sub-projects in Phase I cities, BRT Component in Naya Raipur shall 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 for identified management measures.

Similarly, the sub-projects in Phase I cities, BRT component in Naya Raipur shall 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 no further SA is required, is to be undertaken.

Chapter 3. Project Description

Project interventions in the GEF-SUTP are envisaged in 9 cities of the country and these interventions would need to be consistent with the GEF OP11 priorities to be considered for funding under the program. 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. Two sub-components are being planned as part of project proposal for GEF-SUTP as the (i) service improvements to the planned BRT system and (ii) support for encouraging use of alternative modes of transport which includes a bicycle plan and rental scheme along with a technical study for transit oriented development plan.

In the former sub-component, soft measures as fare integration between existing mass transit systems and BRT, providing control centre for BRT, apart from training for planning unit in BRT are planned. The second component would mostly be Technical Assistance support in the form of studies for alternative modes of transport.

Project outlay for the sub-components is estimated at INR 19.96 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 in the city include (i) improving pedestrian infrastructure in Ajmer City Area (ii) Environmental enhancement of Dargah area through provision of pedestrian infrastructure and (iii) Environmental enhancement of Pushkar area through provision of pedestrian infrastructure.

Sub components of these projects involve civil construction works aimed at the above objectives. Major construction works in these components include construction of subway at railway station road in Ajmer city for safe movement of pedestrians, construction of railway underpass at significant locations outside core city areas, provision of parking facilities outside Dargah area and Pushkar area, paving access routes to the Dargah for demarcating as exclusive pedestrian precincts, 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.

Project outlay for the sub-components is estimated at INR 30.16 Crores. A city level dedicated Project Implementation Unit with CEO, Ajmer Municipal Corporation as the Project Manager is being 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 components as part of the GEF-SUTP include (i) Improvement in the pedestrian facilities for enabling better accessibility to the Multi Modal Transport System (MMTS) .

As part of the first 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, designed and constructed with sufficient detail to function effectively and efficiently for transfer of passengers to MMTS.

Project outlay for the proposed components is estimated at INR 53.08 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.

Sub-components of the proposed interventions in the first component are soft measures that include traffic signal coordination between BRT and other roads for a variable signal timing as per the prevailing traffic conditions, establishing centralized traffic control centre, traffic surveillance and detection system with sensors / cameras to monitor traffic flow and interfacing with Passenger Information System with GPRS.

The second component involves streamlining fare collection mechanisms, integration of fares and extension of services to Radio Taxi, IPT, Parking tariffs etc, establishing central computer system, ticket office terminal and consumer services.

Total project outlay is estimated at INR 44.8 Crores. The proposed project will be implemented by ICTSL and it would be responsible for coordination of DPR preparation, conducting evaluation and quality control.

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), 41000 against the 16,000 daily person trips , thus showing the large possibility of improving and patronizing pedestrian and cycling facility in the city.

Apart from the above described scenario the city also the following problems:

- Lack of any organized public transport;
- Heterogeneous Traffic;
- Un-organized roads without any hierarchy;
- Increasing trends in the use of personalized vehicles;
- Air Pollution – 3rd place among Indian cities with maximum air pollution; and
- Lack of any organized / planned pedestrians facilities in dense core of 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.

The proposed sub-components under the project involve civil construction works as reconditioning of footpaths and construction of cycle tracks. Other improvements in the project would be provision of street furniture, lighting, road markings and traffic signal prioritisation for pedestrians and cycle tracks.

Total project outlay for the City is estimated to be INR 218.5 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.

The proposed project is to be implemented in the first phase 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 road.

For GEF-SUTP project 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 187.66 Crores and is to be implemented in the Phase I 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 involve civil construction works as reconditioning of footpaths, construction of cycle tracks and cycle stands. Other improvements in the project would be provision of street furniture, lighting, road markings and traffic signal prioritisation for pedestrians and cycle tracks.

Total project outlay for the City is estimated to be INR 107.99 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 being envisaged to be setup. The Pune Mahanagar Parivahan Mahamandal Limited (PMPML) established for the Pune metropolitan area is likely to be designated as the PIU.

3.9 TRIVANDRUM

Proposed project interventions in the city are aimed at decongestion of the existing congested areas near railway station and chalai area and 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 involve civil construction works as development of orgnaised parking spaces / structures in Chalai Main Street and railway stations, dedicated

redevelopment of road network surrounding Chalai area, Thampanoor circle roadway system, and elevated walkway. Other measures include declaring the Chalai mainstreet as vehicle free zone and redevelopment of old market area by implementation of pedestrian zone status.

Total project outlay for the project interventions is estimated at INR 49.35 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 nine 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 MSL. Anasagar lake forms the natural boundary in the North-West direction.

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 INDORE

4.2.1. Physical Environment

4.2.1.1. Physiography

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.

4.2.1.2. 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.

4.2.2. 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.

4.2.3. Socio-Economic Environment

4.2.3.1. 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.

4.2.3.2. 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.

4.2.3.3. 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.

4.2.3.4. 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.

4.2.3.5. 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.

4.2.3.6. 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.

4.3 PUNE

4.3.1. Physical Environment

4.3.1.1. 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.

4.3.1.2. 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.

4.3.2. Socio-Economic Environment

4.3.2.1. 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.

4.3.2.2. 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.

4.3.2.3. 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.

4.3.2.4. 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.

4.3.2.5. 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.

4.3.2.6. 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.

4.4 HYDERABAD

4.4.1. Physical Environment

4.4.1.1. Physiography

Hyderabad is located 650mts above mean sea level. The physiography of the city is dominated by hills, tanks, forests and rock formations. Musi river passes through the city.

4.4.1.2. 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 is 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.

4.4.2. 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.

4.4.3. Socio-Economic Environment

4.4.3.1. 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.

4.4.3.2. 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.

4.4.3.3. 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%.

4.4.3.4. 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.

4.4.3.5. 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.

4.4.3.6. 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.

4.5 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^{o}C and the mean daily minimum at about 27^{o}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 lies 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

Around 40% is allocated to Residential land use while 16% is demarcated for transportation and 14% for Parks and Open Spaces.

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.

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.

4.7.3. 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.

4.7.4. 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.

4.7.5. 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 THIRUVANANTHAPURAM

4.8.1. Physical Environment

4.8.1.1. 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.

4.8.1.2. 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.

4.8.2. 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.

4.8.3. Socio-Economic Environment

4.8.3.1. 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.

4.8.3.2. 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.

4.8.3.3. 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%.

4.8.3.4. 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.

4.8.3.5. 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.

4.8.3.6. 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**.

Table 5-1: 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	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

Broad Project Category	Activities / Sub-components	Cities	Impacts
	Provision of Sub-ways / FoBs	Ajmer, Trivandrum	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	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	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 precincts	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 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

Broad Project Category	Activities / Sub-components	Cities	Impacts
	Construction of cycle lanes	Jalandhar, Pune	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	a. Minor construction issues only. Improves safety of precincts with introduction of bollards and adequate street lighting
	Bus-Stops, Signage etc	Hyderabad	a. Improvement in safety of pedestrians
Public Transport Infrastructure	Dedicated Bus-lanes	Naya Raipur	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 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	a. Acquisition of land for the facilities causes – R&R issues as loss of livelihood, loss of shelter, severance of community & social ties

Broad Project Category	Activities / Sub-components	Cities	Impacts
			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	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	a. Improvement in urban air quality
	Traffic Signal Prioritization	Naya Raipur	a. Pedestrian safety issues from reduction of signal times for pedestrians
ITS application to Public Transport	Traffic Signal Improvements	Indore, Mysore, Hyderabad	a. Improvement in traffic flow and reduction of air / noise emissions
	Automatic Fare Collection	Indore, Mysore, Ahmedabad, Hyderabad	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, Hyderabad	a. No impacts anticipated
	Control Rooms	Indore, Mysore, Ahmedabad,	a. Acquisition of land for construction of control rooms may cause R&R issues
Others			a. Would improve air / noise quality in the urban areas

Broad Project Category	Activities / Sub-components	Cities	Impacts
			a. No negative impacts anticipated
	Retrofitting of Bus Fleet	Mysore	a. Aids in reduction of air emissions
Others-Road Infrastructure	Junction/Rotary Improvements	Jalandhar, Ajmer	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 Under 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 / RuB 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 / RuB 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.

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
- 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.

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.
- 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.

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
- Installation of noise screens in case of excessive noise pollution

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
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 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

[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
					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. • A four months advance notice shall be given to salvage crops.

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
2A	Livelihood	Wage earning	Individual	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.
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 a rental assistance as prevailing in the state for a maximum of 3 months.
4A	Additional support to vulnerable groups.	Housing	Household	Assistance	• Additional assistance for vulnerable groups has been provided as part of the entitlement 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.

Category		Type of Loss	Unit of Entitlement	Entitlement	Details
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.
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 CoI, 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 design and all properties/sites/remains notified under the Ancient Sites and Remains Act). No work shall spillover to these properties, premises and precincts.

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 as per GEF OP11 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 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.

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 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. 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

The SUTP is to be implemented and monitored by the steering committee and the MoUD, GoI by a PMU, which will be housed at the IUT. 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. The individual implementing agencies at the city level will constitute their PIUs. 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. **Figure 7-1** indicates the structure of the program management setup.

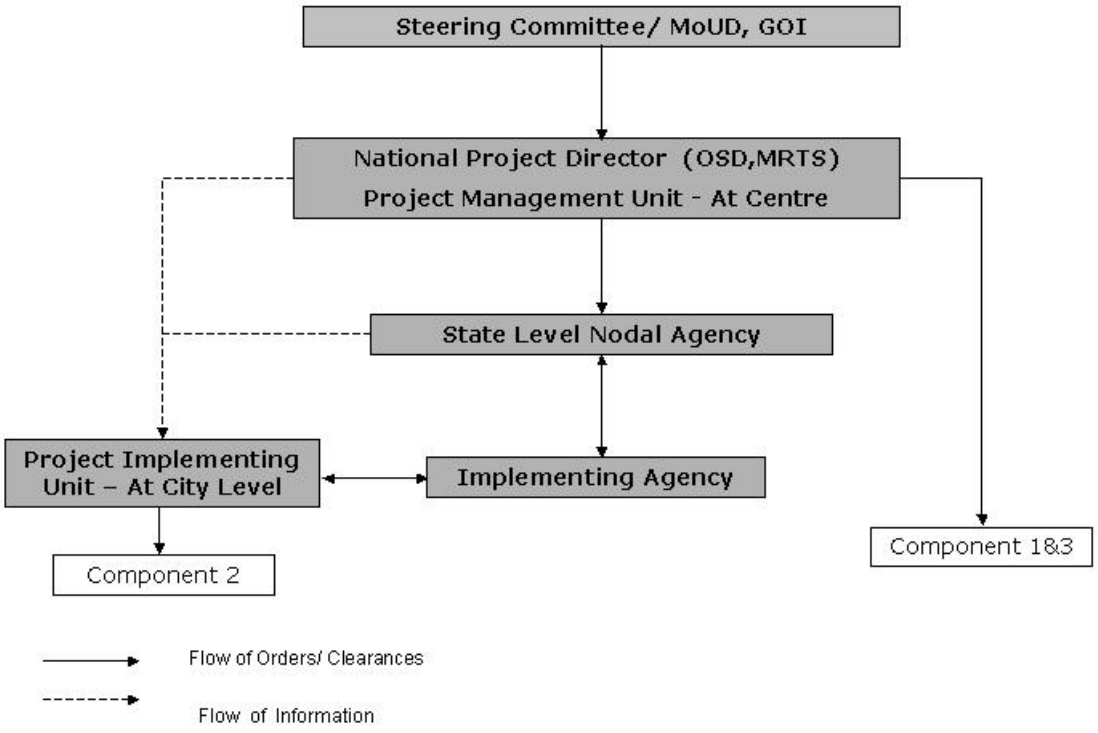

Figure 7-1: Program Management Setup

7.2.1. Project Management

A Project Steering Committee with Secretary, MoUD as Chairman has already been set up. The Steering Committee consists of members from MoEF, DEA and MoUD. The Steering Committee would provide overall guidance and would also perform the monitoring function. UNDP and

World Bank will serve as the designated GEF Implementing Agencies for Component 1 and Component 2 respectively of the project.

The PMU shall provide technical assistance to MoUD in planning, preparation, procurement, implementation, monitoring, evaluation, fund management and reporting required for the two components of GEF-SUTP. The National Project Director who will be OSD, MRTS, will head the PMU. The National Project Manager will be responsible for the day-today activities of the PMU. The PMU for implementing the SUTP will be housed at the IUT. In order to effectively function as the PMU, the MoUD plans to augment the PMU's capacity by appointing a PMC. Therefore, the existing PMU at IUT for project preparation will be further strengthened for project implementation over a period of 4 years and will be assisted by a Project Management Consultant. The Project Manager of the PMU will be the executive officer responsible for the overall management of the program and shall be assisted by a Project Management Consultant group to handle the day-to-day project management activities.

Project Management Consultants: 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.

Finance Manager: Will assist the PMU in managing the financial and administrative aspects of program management.

Environmental & Social Officers of PMU: Two members of the PMU will be designated as Environmental & Social Officers 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 OFFICER

A Civil Engineer with specialization in Environment with experience in the management of infrastructure projects and environmental management.

Roles & Responsibilities

- Review the EIA Documents prepared by the consultants to assess adequacy under the World Bank Safeguard policies including the OP4.01.
- 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 and State Government agencies on environmental and other regulatory matters
- Continuously interact with the NGOs and Community groups that would be involved in the project
- 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

PMU'S SOCIAL OFFICER

A Post Graduate in Social Sciences with over 15 years experience in the management of Social and Resettlement aspects in infrastructure projects.

Roles & Responsibilities

- Review the SIA Documents prepared by the consultants to assess adequacy under the World Bank Safeguard policies.
- 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
- Liaise with various Central and State Government agencies on environmental and other regulatory matters
- Continuously interact with the NGOs and Community groups that would be involved in the project
- 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

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 officers at the Project Management Unit especially for project cities that have potential issues. Interventions in Phase I cities - Hyderabad, Pune and Naya Raipur 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

A Civil Engineer with specialization in Environment / social sciences with experience in the management of infrastructure projects and environmental management.& resettlement

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 Central and 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

PIU'S ENVIRONMENTAL & SOCIAL OFFICER

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.

7.2.2. Participation Agreement

To implement the program according to the agreed terms and conditions, a formal agreement is needed between the MoUD, State Governments and the Implementing Agencies outlining the tasks, responsibilities, schedules, procedures, deliverables etc., required for preparation and implementation of the approved projects. A draft agreement has been prepared and is attached in the project document.

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.

7.3.2.1. Disclosure Policy

The Right to Information Act (RTI), 2005, encourages *suo moto* disclosures and universal access to information wherever in the public interest. The Act requires that records be maintained and be

available to the public. Compliance with the Act is required for all public entities and shall be adhered to by the GEF-SUTP.

As per RTI 2005, the implementing agency MoUD would take specific actions to further enhance governance and accountability in the following key areas:

- Enhanced disclosure of information and full implementation of the recently enacted RTI, which will facilitate oversight by the stakeholders and the general public and thus result in increased accountability.
- Development of a functioning, independent, and credible system to deal with external complaints on procurement, fraud/corruption and construction quality with clearly defined incentives and remedies.
- Strengthened Monitoring Indicators to help MoUD and the Bank monitor compliance with the agreements and assess impact on outcomes.

This 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 or in his absence the PM shall be responsible for ensuring timely and complete dissemination in accordance with this policy.

7.3.2.2. 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 be displayed / disseminated for all the projects undertaken by MoUD.

- 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	Media
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 Project Management Unit & Project Implementation Units (PIU)

Topic	Documents to be disclosed	Frequency	Media
	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. 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 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 Project Management Unit & Project Implementation Units (PIU)
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 Project Management Unit & Project Implementation Units (PIU)

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 inturn 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 - 11** 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 PMU
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 PMU
4	4	Progress on Socio-Economic Survey	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
5	5	Verification of PDFs	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
6	6	Verification of Squatters	Monthly	Environment and Social Officer, PIU	PMC under the PMU
7	7	Verification of Encroachers	Monthly	Environment and Social Officer, PIU	PMC under the PMU
8	8	Distribution of Entitlements and Assistances	Monthly	Environment and Social Officer, PIU	PMC under the PMU
9	9	Progress of Relocation of CPRs	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
10	10	Progress of Relocation of Cultural Property	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
11	11	Progress of Relocation and Site Clearance	Monthly	Environment and Social Officer, PIU	PMC under the PMU
12	12	Community Consultations	Quarterly	Environment and Social Officer, PIU	PMC under the PMU
13.	13.	Progress of Grievance Redressal	Quarterly	Environment and Social Officer, PIU	PMC under the PMU

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	Noise Quality Standards, CPCB	All projects excluding NMT interventions that do not require civil	Contractor through Monitoring Agency

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard	Applicability	Responsibility
					construction period		construction works	
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. The committee shall be formed including the following members:

- Social officer of the PIU;
- Environment and social officer in PMU;
- A representative of women residing the affected area;
- A representative of each of the Scheduled Castes and Scheduled Tribes residing in the affected area;
- A representative of a voluntary organization;
- A representative of the lead bank;
- Chairperson of the municipalities located in the affected area, or their nominees;
- Members of Parliament and Members of Legislative Assembly of the area included in the affected area;
- A representative of the requiring body.

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.

7.6 CAPACITY BUILDING AND TRAINING

Component 1 of the GEF project is intended for capacity building and training of IUT as well as the implementing agencies in the cities. Training modules for environment and social aspects are identified in this section for incorporation into the capacity building program for IUT and implementing agencies. Target groups for training would be the environment and social officers of IUT and city implementing agency for all the sessions and engineers / planners / managers for orientation sessions. **Table 7-4** indicates the training topics, target audience and mode of training. The training sessions would be followed with site visits where indicated to have a 'hands on' approach to the program.

The Environmental and Social Experts need to provide 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 as follows:

- Sensitization
- 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

Table 7-4: Training Modules on 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	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

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	Statutory requirements as per Government of India and World Bank				
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 • 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	Engineers of Implementing agency, PMU and PIU (Technical Unit including the EO & SO)	Lecture and Field Visit	½ Working Day	Environmental & Social Specialists of Design consultant / external agency engaged for capacity building

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	of Affected Properties • Methodology for compensation, resettlement site selection etc.				
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 building

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 BUDGET 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. Tentative budget for each of the project should include the environmental management costs other than the good engineering practices, cost of environmental and resettlement monitoring. Budgetary estimate for fulfilling the project requirements as per ESMF is estimated to be about INR 18.6 crores. Out of which about INR 17 crores is allocated for RAP i.e., towards assistance / compensation. Remaining is 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 costs are provided in table below.

Table 7-4: ESMF Budget

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	Ajmer City						

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
	junction improvement							
	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 planning unit in BRTS organization	Ahmedabad City						
	Bicycle Plan & Bicycle Rental Scheme	Ahmedabad City	324000	300000	100000	3000000	2500000	
	TA for transit oriented development	Ahmedabad City						
	City Sub-Total INR		**324000**	**300000**	**100000**	**3000000**	**2500000**	
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**	

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
Indore	Bus signal prioritization	Along BRTS Corridor						
	Automatic Fare Collection	Along BRTS Corridor						
	City Sub-Total INR		**0**	**0**	**0**	**0**	**0**	
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 transport plan							
	City Sub-Total INR		**0**	**0**	**0**	**0**	**0**	
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		**648000**	**600000**	**200000**	**7500000**	**2500000**	

City	Component	Subcomponent/ Location	Environmental Monitoring	R&R Monitoring	Environmental Management	RAP Budget	Training / Capacity Building	Total INR
	INR							
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		
	TA for preparation of TIMTS							
	City Sub-Total INR		**972000**	**900000**	**300000**	**7000000**	**2500000**	
		Total INR	**5,508,000.00**	**5,100,000.00**	**1,700,000.00**	**35500000**	**17000000**	**64,808,000.00**

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. 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.