

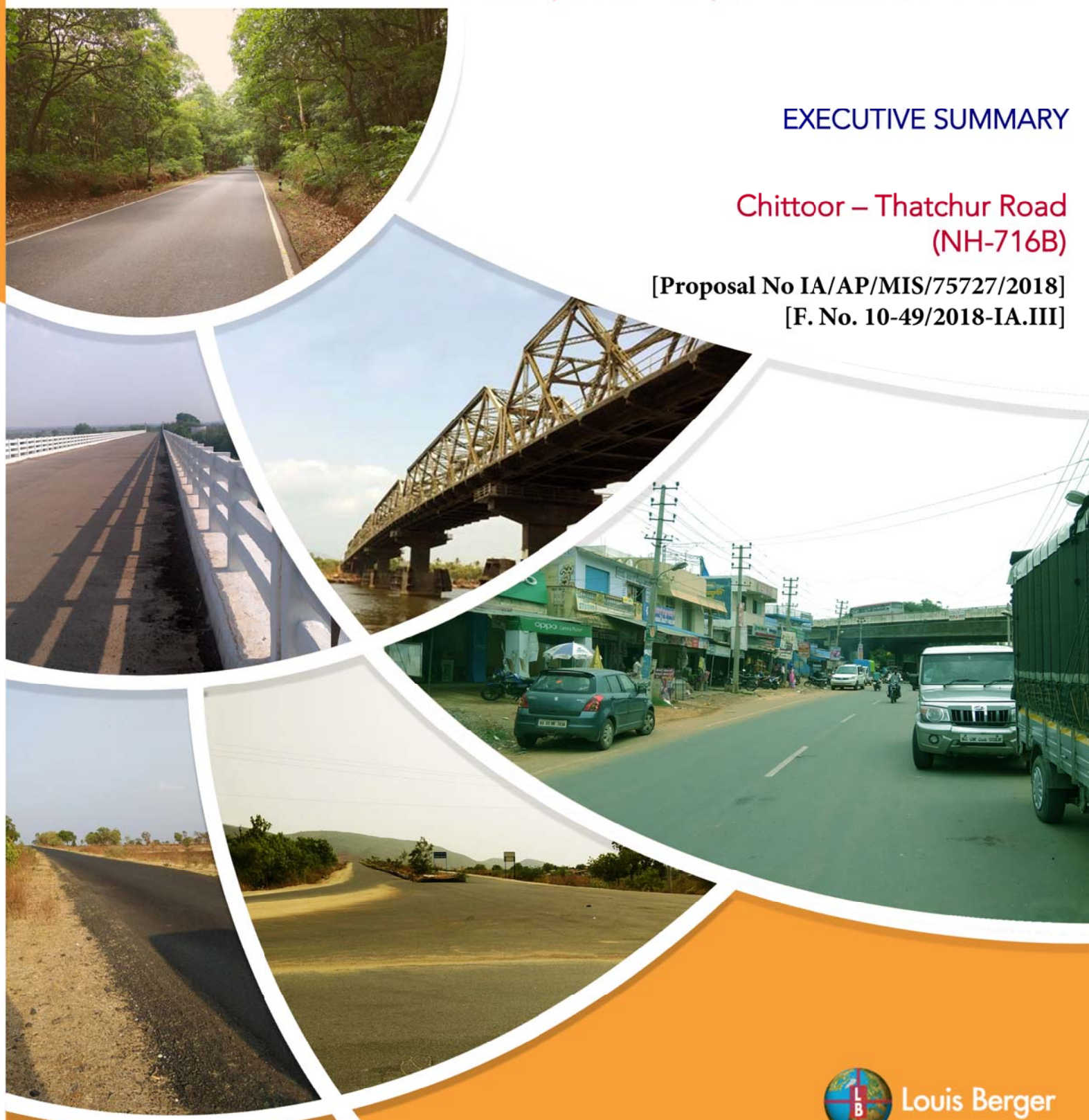


CONSULTANCY SERVICES FOR
PREPARATION OF DPR FOR DEVELOPMENT OF
**ECONOMIC CORRIDORS, INTER CORRIDORS, FEEDER ROUTES TO
IMPROVE THE EFFICIENCY OF FREIGHT MOVEMENT IN INDIA**
UNDER BHARATMALA PARIYOJANA LOT 3
ANDHRA PRADESH, KARNATAKA, GOA & KERALA / PACKAGE 1

EXECUTIVE SUMMARY

Chittoor – Thatchur Road
(NH-716B)

[Proposal No IA/AP/MIS/75727/2018]
[F. No. 10-49/2018-IA.III]



Louis Berger

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CHAPTER-0: EXECUTIVE SUMMARY

0.1 INTRODUCTION

The Ministry of Road, Transport and Highways (MORTH), Government of India through National Highways Authority of India (NHAI) is implementing “Bharatmala Pariyojana”, an umbrella program for the highways sector. This focuses on optimizing efficiency of freight and passenger movement across the country by bridging critical infrastructure gaps through effective solutions like development of economic corridors, inter-corridor, national corridors efficiency improvement, border & international connectivity roads, coastal & port connectivity roads and expressways.

The Letter of Acceptance communicated vide NHAI letter NHAI/Planning/ EC/2016/DPR/Lot 3/ Ap. Knt. Goa &KL/Package 1/98598 dated 21/04/2017. The contract agreement signed on 11/5/2017 vide letter NHAI/planning/EC/2016/DPR/Lot 3/AP, Karnataka, Goa &KL, / Package 1/99575 dated 11/05/2017 with immediate commencement date

The proposed Chennai – Kurnool economic corridor starts from Chennai, terminates in Kurnool, and pass through Puttur, Renigunta, Kadapa and Nandyal. It noted that the section from Nagari to Renigunta has been develop under NHDP. Therefore, if Nagari- Chennai (Thatchur) with a spur to Chittoor section developed as part of Chennai – Kurnool corridor, it would offer alternative connectivity between Chennai and Bangalore/Chittoor. Further the container traffic originating from Bangalore and bound towards the ports of Kamarajar and Kattuppalli currently passes through the congested Chennai bypass and the Tamil Nadu state is developing the northern port access road from Thatchur to Kamarajar (Ennore) and Kattuppalli ports. Therefore Chittoor – Thatchur Greenfield alignment will provide direct port connectivity to Bangalore and Chittoor

A meeting held with NHAI on 28/12/2017 regarding optimizing the project road stretches and it deliberated to alter the start & end to Chittoor – Thatchur. The proposed finalised alignment jointly inspected with PD/PIU/Chennai on 07/01/2018 &11/01/2018. Further, a meeting was held in MORTH for optimizing the Bharatmala economic corridors and it was intimated to us that Chittoor – Thatchur Greenfield alignment will be consider (copy enclosed) contrary to Puttur - Janappanchatram section (AP SH 4421 & TN SH 51). Eventually the Puttur stretch dropped from our scope of work.

A presentation made to Chittoor – Thatchur stretch with Secretary MORTH and other NHAI official on 19/2/2018 for alignment consideration and approval. A presentation also made by consultant during the meeting with Union Minister MORTH, Chief Minister of Tamil Nadu, other state ministers and officials. The alignment was agree in principle during the above meeting. The detailed presentation also made to RO/NHAI/Chennai on 23/03/2018. Based on this NHAI HQs had conveyed its approval on alignment on 06/06/2018. Further, a detailed presentation with all provisions made discussed with NHAI and CGM/NHAI on 30/10/2018 in Regional office Chennai. The alignment notified as NH 716B in Gazette.

0.2 PROJECT DESCRIPTION

The proposed alignment passes through the states of Andhra Pradesh and Tamil Nadu in the districts of Chittoor and Thiruvallur respectively. The salient features of the proposed project given below:

Table 0.1: Salient features of the proposed project road

S No	Particulars	Proposed (Design)
Technical Features		
1	State and District	Chittoor district of Andhra Pradesh and Thiruvallur district of Tamil Nadu
2	Length	126.550km
3	Total Area of Land Acquisition	About 884.26hectares for main alignment except for interchanges and other project facilities
4	Seismic Zone	Zone 2
5	Proposed Carriageway	6-lane divided carriageway configuration
6	Proposed ROW	70m
7	Design Speed	100kmph
8	Embankment	About 2m to 3m on existing ground generally
9	Tunnels (length, seepage, emergency exit, drilling/blasting,	Not applicable. No tunnel involved in the project
10	Junctions/ Fly Over/Interchange	One trumpet, two cloverleaf and five viaduct interchanges
11	Vehicular Underpasses	VUP 10no, LVUP 38no and SVUP 8no
12	ROB	2no
13	RUB	Nil
14	Major Bridges	4no
15	Minor Bridges	20no
16	Culverts	200no
17	Service Roads/Slip Roads	Slip roads provided in all interchange locations for converging and diverging traffic
18	CBR adopted for pavement design	8% as per IRC standards
19	Median	5m
20	Service Road	Wherever required
21	Slope protection	Turf/ stone pitching
22	Safety Measure	Crash Barriers provided
23	Lighting	Lighting in all proposed Interchanges and toll plaza etc.
24	Horticulture and landscaping	Throughout
Environmental Features		
25	Whether passing through Wildlife area/Protected area/CRZ	No
26	Protected Monuments & structures	No

S No	Particulars	Proposed (Design)
Technical Features		
27	Land Use Pattern	Land use within 10km buffer from either side of project roads: <ul style="list-style-type: none"> • Vegetation/agricultural :76% • Settlement : 1% • Barren/fallow land : 6% • Forest land : 12% • Water bodies : 5%
28	Forest Land Diversion	Yes
29	Tree	19,581
30	River crossings/Stream crossing	24no
31	Ponds	21no
32	Terrain	Mix of Plain and rolling
33	Green belt development	As per IRC SP 21:2009 /MORTH Code/Guidelines and Green corridor's terms of reference for plantation by GHD/NHAI
34	Mangroves, sand dunes etc.	N/A
35	Environmental Management Cost including Corporate Environmental Responsibility Cost	INR 55.64crores
36	No. of social structures Affected	Marginal due to Greenfield

0.3 POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

The proposed road development project of NH 716B is a New National Highway with Right of Way (ROW) requirement of 70m. Hence, as per EIA notification 2006, the proposed project falls under "Category A" and attracts the conditions of obtaining prior Environmental Clearance from Ministry of Environment, Forest & Climate Change (MoEF&CC).

0.4 ANALYSIS OF ALTERNATIVES

Table 0.2: Comparison between 'With' and 'Without Project' Scenarios

Component	“With” Project Scenario	“Without” Project Scenario
Carriageway	The carriageway will be construct to 6-lane configuration with paved and earthen shoulders on either side. This will ensure seamless traffic flow	The Freight traffic will traverse through Chennai City area and further lead to traffic congestion.
Traffic Congestion	The new road will be capable of ensuring uninterrupted free flow traffic. This will ensure the Chennai city free from long route trucks that do not need to enter just for passage. The environment parameters of the region will significantly improve besides saving in vehicle operating cost.	The heavy traffic will continue to move through the city thereby mixing with the city traffic and increase the traffic congestion in Chennai city
Road Safety	There will be a decrease in the number of road accidents after development of the new highway, as there will be adequate space for plying vehicles to cross and overtake. The city traffic will be separate with through commercial traffic and thereby ensure adequate safety to light city vehicles.	Mix of city traffic with through commercial traffic lead to traffic congestion in all arterial roads. This leads to many road accidents. As per the community consultation, many accidents are taking place on the existing road stretches due to mix traffic. With increase in traffic, the situation may worsen.
Environmental Quality	The free flow of traffic on the new highway will improve the environmental quality, as the emissions from the plying vehicles will reduce due to seamless flow. There will be temporary increase in dust and emissions during the construction phase only and is reversible.	Environmental quality will further deteriorate due to pollution and high emission from slow traffic movement and congestions. With increase in traffic, the pace of degradation of environment will only hasten.
Transportation Facilities	Free flow interchanges, VUPs/LVUPs, and truck lay byes proposed along the project road for convenience of people. Thus, the travel quality will drastically improve on the road conditions.	Bad travel quality.

Component	“With” Project Scenario	“Without” Project Scenario
Economic Development	Economic activities will automatically improve once the new road developed around the Bangalore city. It will also benefit farmers, as they will be able to sell their produce in distant markets due to improved transportation.	The economic activity will remain static and local and will improve only at a laggard pace.
Employment Opportunities	The proposed construction and improvement of project roads will require around 50 technical staff, 100 skilled labours and 200 non-skilled labours during construction phase.	No such opportunity
Development Potential	There will be higher potential for development in this area due to improvement in access and consequent increase in economic activity. Essential community infrastructures like drainage system, water supply, electricity, transportation etc. will come as consequence of current development.	Development activity will greatly hampered due to inadequate connectivity.

It can be concluded that “With” project scenario having positive/ beneficial impacts will significantly enhance social & economic development of the region when compared to the “Without” project scenario. Hence, the “With” project scenario with some reversible impacts is a preferred and acceptable option rather than the “Without” project scenario. The implementation of the project, therefore, will definitely be beneficial for overall socio-economic environment of the impacted region.

0.5 ENVIRONMENTAL BASELINE DATA

The brief description of the environment given as follows:

Table 0.3: Brief Description of the Environment

S. No.	PARAMETER	DESCRIPTION
1. Physical Environment		
(i)	Topography and Geography	The project road section of Chittoor – Thatchur road, newly declared NH 716B passes mainly through Plain/rolling terrain. The alignment passes through Chittoor district of Andhra Pradesh and Thiruvallur district of Tamil Nadu.
(ii)	Geology and Seismicity	The Chittoor district forms a part of the Mysore plateau with many hill ranges and undulating plains

S. No.	PARAMETER	DESCRIPTION
		<p>The soil of the Thiruvallur district is mostly sandy, mixed with soda or other alkali or stony. Rocks found in and near the surface are in detached masses. Hence, the soil cannot be termed as very fertile</p> <p>The project influence area falls under Zone II</p>
(iii)	Soils	<p>The soils in the Chittoor district constitute red loamy 57%, red sandy 34% and the remaining 9% is covered by black clay black loamy, black sandy and red clay</p> <p>The soil of the Thiruvallur district is mostly sandy, mixed with soda or other alkali or stony. Rocks found in and near the surface are in detached masses</p>
(iv)	Borrow Areas	Total 13 borrow areas have been identified for the project.
(vi)	Fly Ash	Fly ash available from the Ennore Thermal Power Plant, North Chennai Thermal Power Station Sri Damodaram Sanjeevaiah Thermal Power Station and Rayalseema Thermal Power Plant and APPDC Thermal Power Plant will used for construction purposes.
(vii)	Land Use Pattern	In project influence area (within 10km from roads), the predominant land use is agriculture (76%), barren land/fallow land (6%), forestland (12%), water body (5%) and settlements (1%).
2.	Meteorology	<p>Chittoor district receives an annual rainfall of 918.1 mm. The South West Monsoon and North East Monsoon are the major sources of rainfall for the district. On average the district receives 438.0 mm of rainfall through the South West Monsoon (From June to September) and 396.0 mm from North East Monsoon (From October to December)</p> <p>The summer temperatures touches 46 °C in the eastern parts whereas in the western parts it ranges around 36° to 38 °C. Similarly the winter temperatures of the western parts are relatively low ranging around 12 °C to 14 °C and in eastern parts it is 16 °C to 18 °C</p> <p>The average normal rainfall of Thiruvallur District is 1104 mm. Out of which 52% has received during North East Monsoon period and 41% has received during South West Monsoon period</p>
3.	Air	Ambient Air Quality data collected during the month of June 2018 from nine locations along the project road. The parameters monitored were Particulate Matter (<PM ₁₀); Particulate Matter (<PM _{2.5}); Sulphur dioxide (SO ₂), Nitrogen oxide (NO _x) and Carbon monoxide (CO).The monitoring results reveal that Ambient Air Quality parameters are found to be below the prescribed permissible limits of CPCB.

S. No.	PARAMETER	DESCRIPTION
4. Water		
(i)	Water resources	<p><u>Surface Water Resources</u></p> <p>Provision of bridges will be considered for 24 streams lying along the project alignment. 21 ponds are lying along the proposed alignment which will be enhanced with proper mitigation measures.</p> <p><u>Ground Water Resources</u></p> <p>Locals use dug wells, hand pumps, bore well and wells at some places in the alignment for various purposes. The water requirements at these locations are met either through surface water sources or through various mini water supply schemes or from ground water resources. Rainwater harvesting will be proposed at various location along the project alignment nearby the natural drains and nearby the settlement areas for the groundwater recharging to balance the water consumption during construction period. The Locations will be identified by NHA/IE.</p>
(ii)	Water Quality	<p><u>Surface Water Quality</u></p> <p>The surface water sample collected from five locations. The physio-chemical analysis of water samples revealed that the water quality criteria of study area fall in the range of Class B-E water prescribed by CPCB (as per the overall result) and hence recommended for Irrigation, Industrial cooling, Controlled waste Disposal</p> <p>The parameters is found to be well within the IS 2296 limits at all monitoring locations of surface water except pH value of SWQ-1 and TDS value of SWQ-2.</p> <p><u>Ground Water Quality</u></p> <p>Ground water quality assessed along the project area in 5 locations. It is observed that the ground water is suitable for drinking, after necessary disinfection in general</p> <p>The deep ground water is generally alkaline. The deep waters are generally suitable for agricultural and irrigation purposes</p>
5.	Noise	Ambient Noise levels taken during the month of June 2018 from nine locations from 6:00 am to 10:00 pm (Day) and from 10:00 pm to 6:00 am (Night). Daytime noise levels are in the range of 60.73 dBA to 73.03 dBA and the nighttime noise levels are in the range of 63.6 dBA to 50.67 dBA.
6.	Biological Environment	

S. No.	PARAMETER	DESCRIPTION
(i)	Forest	Alignment passes through Pulikondram reserve forest from km 86.800 to 87.500 (700m)
(ii)	Flora	Predominant tree species found along the project road. Total number of trees falling within 70m PROW of project roads is 19,581no. Plantation along the highway shall take up as per Green plantation strategy (as per IRC: SP-21:2009). Shrubs will be planted on the medians.
(iii)	Fauna	The fauna in the project vicinity reported to be not rich. No habitat fragmentation is likely to take place because of the proposed project.
7.	Socio-economic environment	74 (43 in Chittoor & 31 in Thiruvallur) villages lie along the NH-716B. Most of the people in affected villages depend on agriculture for their livelihood. The major agricultural crops in the district are grown Paddy and sugarcane. People will be employed in constructions, government jobs, and agriculture including household activities.

0.6 IMPACTS MITIGATION AND ENHANCEMENT MEASURES

Table 0.4: General Impacts on Natural Environment

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Road Operation	Indirect effects of operation or Induced development
		Removal of Sensitive Receptors	Removal of trees and vegetation	Earth works including quarrying	Laying of pavement	Vehicle & Machine operation & maintenance	Asphalt & crusher plants	Sanitation & Waste (labour camps)		
Env. component Affected	Land acquisition	Removal of Sensitive Receptors	Removal of trees and vegetation	Earth works including quarrying	Laying of pavement	Vehicle & Machine operation & maintenance	Asphalt & crusher plants	Sanitation & Waste (labour camps)	Movement of Vehicle	
Air		Dust generation during dismantling	Reduced buffering of air and noise pollution, Hotter, drier microclimate	Dust generation	Asphalt odour	Dust and Pollution	Soot, odour, dust and pollution	Odour / smoke	Dust and Pollution	other pollution
Land	Loss of productivity of Land	Generation of debris	Erosion and loss of top soil	Erosion, loss of top soil and natural fertility	Pressure on Base Area	Contamination by fuel and lubricants Compaction	Contamination Compaction of soil	Contamination from wastes	Spill due to accidents Deposition of lead	Change in cropping pattern

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Road Operation	Indirect effects of operation or Induced development
Water	Loss of water sources	Siltation due to loose earth	Siltation due to loose earth	Alteration of drainage Break in continuity of ditches Siltation, Stagnant water pools in quarries.	Affecting available groundwater source and Reduction of ground water recharge area	Degradation of available water sources nearby the construction zone and Contamination by fuel and lubricants	Contamination by asphalt leakage or fuel	Contamination from wastes Overuse	Spill Contamination by fuel, lubricants and washing of vehicles	Increased contamination of ground water
Noise		Noise Pollution	Noise Generation due to machinery work	Noise Generation due to machinery work	Low Level noise due to working of running equipment	Noise Generation due to machinery work	Noise Generation due to machinery work		Noise Generation due to Vehicle movement	Noise Pollution
Flora		Loss of Biomass	Loss of Natural affection	Removal of Vegetation Lowered productivity Loss of ground for vegetation		Removal of vegetation	Lower productivity Use as fuel wood	Felling trees for fuel	Lowered Productivity due to Toxicity to vegetation.	

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Road Operation	Indirect effects of operation or Induced development
Fauna			Disturbance Habitat/Wildlife loss	Disturbance		Disturbance	Disturbance	Poaching	Collision with traffic and chances of accidents	Distorted habitat

Table 0.5: General Impacts on Social and Cultural Environment

Project Activity	Planning and Design Phase	Pre-construction Phase			Construction Phase					Operation	
										Direct	Indirect Induced development
Social Component Affected	Design decisions & Implementation policies	Land acquisition	Removal of Structures	Removal of trees & vegetation	Earth works including quarrying	Laying of pavement	Vehicle & machine operation & maintenance	Asphalt and crusher plants	Labour Camps	Vehicle operation	-
Agricultural land	-	Change in land type and prices	Loss of land economic value	Loss of standing crops	Loss of productive land	Loose top soil fertility	-	Dust on agricultural land reduce the productivity	-	-	Conversion of Agricultural Land

Project Activity	Planning and Design Phase	Pre-construction Phase			Construction Phase					Operation	
										Direct	Indirect Induced development
Buildings and built-up structures	-	Change in land type and prices	Loss of structures, Debris generation, Noise and Air pollution	-	Noise, vibration may cause damage to structures	-	Noise, vibration may cause damage to structures	Dust accumulation on building and structure	-	Vibration and noise	Change in building use and characteristics
People and Community	Anxiety and fear among community	-	Displacement of people Psychological impact on people loss of livelihood	Loss of shade & community trees, Loss of fuel wood and fodder, Loss of income	Noise and Air pollution	Odour and dust	Noise and Air pollution, Collision with pedestrians livestock and vehicles	Air and noise pollution and discomfort	Community clashes with migrant labour	Noise pollution, Risk of accident	Induced pollution
Cultural Assets	-	-	Displacement loss of structure within ROW	Loss of sacred trees.	Noise, vibration may cause damage to structure	-	Damage from vibration & air pollution	Dust accumulation	-	Damage from vibration & air pollution	-

Project Activity	Planning and Design Phase	Pre-construction Phase			Construction Phase					Operation	
										Direct	Indirect Induced development
Utilities and Amenities	-	-	Interruption in supply	-	-	-	Damage to utility and amenities	Dust accumulation on water bodies	Pressure on existing nearby amenities		-
Labour's Health & Safety	-	-	-	-	Increase of stagnant water and disease	Asphalt odour and dust	Collisions with vehicles, pedestrians & livestock	Impact on health due to dust generation	Increase in communicable diseases	Collisions pedestrians & livestock	-

0.7 IMPACT MITIGATION AND ENHANCEMENT

Prevention or avoidance of impact is better than mitigation of impact. Hence, avoidance and reduction of adverse impacts approaches adopted during the design stage through continued interaction between the design and environmental teams. This reflected in the designs of the horizontal & vertical alignment, cross sections adopted, construction methods and construction materials. In-depth site investigations have carried out so that sensitive environmental resources are effectively avoid leading to the environmentally best-fit alignment option.

0.8 PUBLIC CONSULTATIONS

Informal and formal consultations with communities as well as affected households have been/are carried out during various stages of the project.

Peoples' Perception about Environment and Social issues gathered during the informal and formal consultations given below.

Table 0.6: Peoples' Perception about Environment and Social issues

S. No.	Environmental Issue discussed	Response Received	Suggestions given by participants	Findings of the public consultation
1	Air quality of the area	Public are of the view that air quality is not an issue in the area as the settlement area are located away from industrial units and air pollution due to vehicular traffic will be a concern during operational stage.	Adequate vegetation cover on either side of the project road would reduce pollutants migrating to village areas	Air quality is not an issue of concern in the project area. With the proposed development there will be no impact on the air quality in the area as majority of the settlements are located away from the main road. It is anticipate that the proposed avenue plantation would be helpful in checking pollutants being disperse to settlements.
2	Water quality	Water quality of surface water bodies' i.e. rivers and canals is satisfactory. The surface water sources used mainly for bathing and washing purposes.	Runoff from the project road should be contained appropriately and no run off should find their path to the water resources being used by residents for cultivation as well as to meet their daily chores	Water harvesting structures on either side of the project road is a good proposition to recharge ground as well as to contain pollutants resulting from vehicular traffic.

S. No.	Environmental Issue discussed	Response Received	Suggestions given by participants	Findings of the public consultation
3	Noise level of the area	Vehicular movement is the prime cause of noise generation	Adequate avenue plantation (multiple rows) would reduce the noise spreading to nearby settlements	Noise is one of the major concern to habitations abutting the highways
4	Drainage	Water logging at few stretches of the alignment because of the rivers and creeks make the land unsuitable for cultivation	Road construction activities should ensure that slope of road is not such that it results in flooding in the nearby settlements.	Adequate measures will be incorporate during the design stage so that flooding; waterlogging, marshy situation does not prevail.
5	Removal of large number of tree	Road projects development would result in removal of large number of trees of common occurrence.	These should be adequately compensated with the right mix of species in consultation with the affected communities and forest department	Compensatory afforestation should be carryout to make up for the loss incurred due to felling of trees for the proposed widening activity.
6	Social Issues	Apprehension to become marginalized and jobless	Adequate livelihood support to the affected persons and rearrangements for affected families who are losing residents structures	Design shall be adjusted to avoid impact on built up area and Payment of compensation at market value

0.9 BENEFITS OF THE PROJECT

The project will give significant economic benefits to both States. Construction of the project road will lead to better connectivity and will play a significant role in changing the socio-economic condition of the people living in the region. The development of this corridor will decongest Chennai city traffic and enhance Chennai city environment because:

1. The proposed greenfield alignment will provide direct connectivity to Kamarajar (Ennore) and Kattupalli ports through Bangalore – Chennai expressway
2. The alignment will ensure seamless connectivity without mixing with Chennai city traffic

3. This route will decongest Chennai city from port bound heavy truck traffic
4. This corridor will provide connectivity to Ponneri Smart City and Mahindra World City
5. Improve air quality due to reduction in truck traffic through Chennai city
6. Will provide connectivity to SEZs and other industrial estates in the vicinity of port
7. Sri City will get better connectivity from Bangalore, Chittoor, Kadapa and Tirupati etc

The project will also generate direct and indirect employment to the local people of the States. The indirect benefits include savings in vehicle operating costs, less fuel consumption and decreased cost of passenger travel.

0.10 ENVIRONMENTAL MONITORING PROGRAMME

The environmental monitoring programme of air quality, noise quality, water quality, soil quality and roadside plantation during construction and operation phases has suggested in Chapter 10. The estimated monitoring cost is INR 50 lac

0.11 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Environmental management plan has been prepared for mitigation/ management/avoidance of the potential adverse impacts and enhancement of various environmental components along the project road. For each mitigation measure to carry out its location, period, implementation and overseeing/ supervising responsibilities have identified. Monitoring plan for construction and operation phase has framed to ensure effective implementation EMP. The EMP will be part of contract document. The total EMP budget has estimated as **INR 55.64 Crores**. The EMP will be implement by the contractor under the supervision of PMC and environmental Cell of Concessionaire during construction. During operation phase, EMP will be implemented by the concessionaire.