

PRE-FEASIBILITY REPORT

For

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) AND ENVIRONMENTAL MANAGEMENT PLAN (EMP)

For

**CONSTRUCTION OF 4 LANE AT GRADE/ ELEVATED GANGA PATH
CONNECTING SULTANGANJ – BHAGALPUR – SABOUR ON HYBRID
ANNUITY MODE (LENGTH: 41.258 KM, COMPRISING 30.518 KM OF AT-
GRADE/EMBANKMENT SECTION AND 10.740 KM OF ELEVATED
SECTION)**

[Schedule 8(b) “Townships and Area Development Projects”, Category B]

Submitted to

State Level Expert Appraisal Committee (SEAC), Bihar

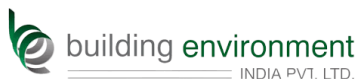
Submitted by

**BIHAR STATE ROAD DEVELOPMENT CORPORATION LIMITED
(BSRDCL)**

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1 EXECUTIVE SUMMARY

The proposed project involves the construction of 4 Lane at Grade/ Elevated Ganga Path connecting Sultanganj – Bhagalpur – Sabour under the Hybrid Annuity Mode 3 (HAM 3). The project is being implemented by the Bihar State Road Development Corporation Limited (BSRDCL) in the Bhagalpur district of Bihar. The total length of the proposed greenfield corridor is 41.258 km, comprising 30.518 km of at-grade section and 10.740 km of elevated section. The salient feature of the proposed project is as provide in **Table 1-1**.

Table 1-1: Salient Features of project

Sr. No.	Particulars		Proposed Details								
1.	Alignment	:	Construction of 4 Lane at Grade/ Elevated Ganga Path connecting Sultanganj – Bhagalpur – Sabour on Hybrid Annuity Mode (Length: 41.258 km, comprising 30.518 km of at-grade/embankment section and 10.740 km of elevated section)								
2.	Geographical location	:	Starting Point: Ch. 0+000 (25°14’46.46” N, 86°43’39.91” E) at Sultanganj End Point: 41+258 (25°13'39.91" N, 87°04'49.79" E) at Sabour The proposed road starts at NH-33 near Sultanganj and end at NH-33 near Sabour								
3.	Location the proposed project	:	District: Bhagalpur State: Bihar								
4.	Alignment passing through the Tehsils		The Alignment is passing through 5 Talukas in Bhagalpur District <table> <tr> <th>District</th> <th>Taluka</th> </tr> <tr> <td rowspan="5">Bhagalpur</td> <td>Sultanganj</td> </tr> <tr> <td>Narayanpur</td> </tr> <tr> <td>Nathnagar</td> </tr> <tr> <td>Jagdishpur</td> </tr> <tr> <td>Sabour</td> </tr> </table>	District	Taluka	Bhagalpur	Sultanganj	Narayanpur	Nathnagar	Jagdishpur	Sabour
District	Taluka										
Bhagalpur	Sultanganj										
	Narayanpur										
	Nathnagar										
	Jagdishpur										
	Sabour										
5.	Connecting villages	:	Bhagalpur: 41 Villages Sultanganj Wards 01, 02, 03, and 08; Nawada; Tilakpur; Kalyanpur; Chaturbhujpur (Shankarchak); Sankar Chowk; Tahawarnagar; Basantchak urf Basantpur; Baikatpur; Eusufpur; Mirzapur; Shahzadpur; Ajmeripur; Rattipur; Rasidpur; Serampur; Parnathpur; Darabpur; Barari; Fatehpur; Sabour; Kakan Kita; Nabipur; Bagder; Pharka; Habib Chowk; Meharban Chowk; Mathurapur; and Kalupur, along with Bhagalpur Municipal Corporation Wards 01, 03, 05, 18, 21, 22, and 24								
6.	Length of the proposed alignment	:	41.258 km at-grade section: 30.518 km								

Sr. No.	Particulars		Proposed Details																
			elevated section: 10.740 km																
7.	Project cost	:	Total estimated cost ~ ₹4993 Crore																
8.	Total land acquisition	:	Total: 270.66 Ha																
			Non-Forest Land: 270.66 Ha																
			Forest land: Nil																
9.	Carriageway	:	27.00 mt																
10.	Design Speed	:	Plain: 100 km/hr																
11.	Proposed ROW	:	30-80 m																
12.	Proposed Intersections	:	3 Nos. of interchange at following locations: <table border="1"> <thead> <tr> <th>Chainage (Km)</th><th>Type</th><th>Connecting Road</th><th>Location</th></tr> </thead> <tbody> <tr> <td>3+790</td><td>T-Junction</td><td>Sultanganj – Aguwani Bridge</td><td>Sultanganj</td></tr> <tr> <td>24+730</td><td>T-Junction</td><td>Sultanganj – Bhagalpur Road</td><td>Bhagalpur</td></tr> <tr> <td>40+710</td><td>Trumpet Interchange</td><td>NH-33</td><td>Sabour</td></tr> </tbody> </table>	Chainage (Km)	Type	Connecting Road	Location	3+790	T-Junction	Sultanganj – Aguwani Bridge	Sultanganj	24+730	T-Junction	Sultanganj – Bhagalpur Road	Bhagalpur	40+710	Trumpet Interchange	NH-33	Sabour
Chainage (Km)	Type	Connecting Road	Location																
3+790	T-Junction	Sultanganj – Aguwani Bridge	Sultanganj																
24+730	T-Junction	Sultanganj – Bhagalpur Road	Bhagalpur																
40+710	Trumpet Interchange	NH-33	Sabour																
13.	Bridges	:	Major bridges: 4 Nos. Minor bridges: 2 Nos.																
14.	Elevated Section	:	2 locations (1570 m length and 8990 m length)																
15.	Vehicular overpass & underpass	:	VUP: 9 Nos. LVUP: 9 Nos. SVUP: 18 Nos.																
16.	Culverts	:	67 Nos.																
17.	Median	:	3.00 m to 5.00 m																
18.	Paved Shoulder	:	2.50 m																
19.	Earthen Shoulder	:	1.50 m																
20.	Tunnels	:	Nil																
21.	Embankment	:	Average height of embankment: > 3.0 m																
22.	Service Road / Slip Road	:	1.5 m																
23.	RWH structures	:	Rainwater harvesting structures are proposed at every 500 m interval throughout the alignment as per IRC: SP-50:1999 by taking Adequate measures.																
24.	Plantation	:	Throughout																

Chapter 1. Introduction of the project / background information

1.1 Project Background

The proposed project involves the construction of a 4-Lane At-Grade/Elevated Ganga Path connecting Sultanganj – Bhagalpur – Sabour under the Hybrid Annuity Mode (HAM). The project is being implemented by the Bihar State Road Development Corporation Limited (BSRDCL) in the Munger and Bhagalpur districts of Bihar. The total length of the proposed greenfield corridor is 41.258 km, comprising 30.518 km of at-grade section and 10.740 km of elevated section.

Within Bhagalpur District, the alignment traverses or passes adjacent to 41 villages and urban wards, including Sultanganj Wards 01, 02, 03, and 08; Nawada; Tilakpur; Kalyanpur; Chaturbhujpur (Shankarchak); Sankar Chowk; Tahawarnagar; Basantchak urf Basantpur; Baikatpur; Eusufpur; Mirzapur; Shahzadpur; Ajmeripur; Rattipur; Rasidpur; Serampur; Parnathpur; Darabpur; Barari; Fatehpur; Sabour; Kakan Kita; Nabipur; Bagder; Pharka; Habib Chowk; Meharban Chowk; Mathurapur; and Kalupur, together with Bhagalpur Municipal Corporation Wards 01, 03, 05, 18, 21, 22, and 24.

The proposed alignment traverses agricultural land, rural settlements, urban areas, riverine landscapes, and floodplain regions associated with the River Ganga. It also passes through portions of the Eco-Sensitive Zone (ESZ) of the Vikramshila Gangetic Dolphin Sanctuary.

This option of new connectivity is economical option to diversion of the traffic, boost to development and providing employment opportunities in industrial and truism sector the region.

As per the Environment Impact Assessment (EIA) Notification dated 14th September, 2006, as amended this is Category B project with type number '8 (b)' "Townships and Area Development", Category B1, which require preparation of EIA Report and requires Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA).

1.2 Identification of Project Proponent

Bihar State Road Development Corporation Limited (BSRDCL), a Government of Bihar undertaking, was incorporated under the provisions of the Companies Act, 1956, with the objective of planning, developing, improving, constructing, operating, administering, managing, controlling, and maintaining road infrastructure across the State of Bihar and, where required, elsewhere in India. The Corporation is entrusted with the development of various transportation infrastructure facilities, including roads, highways, expressways, bridges, flyovers, tunnels, streets, pathways, sidewalks, approach roads, and other allied infrastructure works and public utilities. BSRDCL also undertakes the construction of temporary shelters and emergency infrastructure during natural calamities or other emergency situations.

These activities are executed on behalf of the Road Construction Department, Government of Bihar, or directly for other departments, agencies, organizations, and statutory bodies of the

Government of Bihar, with the objective of providing safe, efficient, and sustainable transportation infrastructure in the State. Details of project Proponents:

Proponent	:	Bihar State Road Development Corporation Limited (BSRDCL)
In-Charge person	:	Mr. Avinash Kumar Deputy General Manager (Tech) PIU Bhagalpur
Registered Address	:	RCD Mechanical Workshop Campus, Near Patna Airport, Sheikhpura, Patna 800014 (Bihar)
Address for correspondence:	:	Bihar State Road Development Corporation Limited (BSRDCL) PIU, Bhagalpur SE National Highway Circle Office Campus, Zero Mile, Bhagalpur-813210

1.3 Description of Nature of the project

The Project starts at Sultanganj 25°14'46.46" N latitude and 86°43'39.91" E longitude and ends at Sabour 25°13'39.91" N latitude and 87°04'49.79" E longitude. It passes through district of Bhagalpur. The alignment generally follows the southern bank of the River Ganga, traversing predominantly plain alluvial terrain and providing an important regional transport corridor connecting Munger and Bhagalpur. Refer Figure 2-2 for alignment location. The salient feature of the proposed project is as provide in **Table 1-1**.

Table 1-1: Salient Features of project

Sr. No.	Particulars		Proposed Details	
1.	Alignment	:	Construction of 4 Lane at Grade/ Elevated Ganga Path connecting Sultanganj – Bhagalpur – Sabour on Hybrid Annuity Mode (Length: 41.258 km, comprising 30.518 km of at-grade/embankment section and 10.740 km of elevated section)	
2.	Geographical location	:	Starting Point: Ch. 0+000 (25°14’46.46” N, 86°43’39.91” E) at Sultanganj End Point: 41+258 (25°13'39.91" N, 87°04'49.79" E) at Sabour The proposed road starts at NH-33 near Sultanganj and end at NH-33 near Sabour	
3.	Location the proposed project	:	District: Bhagalpur State: Bihar	
4.	Alignment passing through the Tehsils		The Alignment is passing through 5 Talukas in Bhagalpur District	
			District	Taluka
			Bhagalpur	Sultanganj
				Narayanpur

Sr. No.	Particulars		Proposed Details	
				Nathnagar
				Jagdishpur
				Sabour
5.	Connecting villages	:	Bhagalpur: 41 Villages Sultanganj Wards 01, 02, 03, and 08; Nawada; Tilakpur; Kalyanpur; Chaturbhujpur (Shankarchak); Sankar Chowk; Tahawarnagar; Basantchak urf Basantpur; Baikatpur; Eusufpur; Mirzapur; Shahzadpur; Ajmeripur; Rattipur; Rasidpur; Serampur; Parnathpur; Darabpur; Barari; Fatehpur; Sabour; Kakan Kita; Nabipur; Bagder; Pharka; Habib Chowk; Meharban Chowk; Mathurapur; and Kalupur, along with Bhagalpur Municipal Corporation Wards 01, 03, 05, 18, 21, 22, and 24	
6.	Length of the proposed alignment	:	41.258 km at-grade section: 30.518 km elevated section: 10.740 km	
7.	Project cost	:	Total estimated cost ~ ₹4993 Crore	
8.	Total land acquisition	:	Total: 270.66 Ha	
		:	Non-Forest Land: 270.66 Ha	
		:	Forest land: Nil	
9.	Carriageway	:	27.00 mt	
10.	Design Speed	:	Plain: 100 km/hr	
11.	Proposed ROW	:	30-80 m	
12.	Proposed Intersections	:	3 Nos. of interchange at following locations:	
			Chainage (Km)	Type
			Connecting Road	Location
			3+790	T-Junction
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			40+710	Trumpet Interchange
13.	Bridges	:	Major bridges: 4 Nos. Minor bridges: 2 Nos.	
14.	Elevated Section	:	2 locations (1570 m length and 8990 m length)	
15.	Vehicular overpass & underpass	:	VUP: 9 Nos. LVUP: 9 Nos. SVUP: 18 Nos.	
16.	Culverts	:	67 Nos.	
17.	Median	:	3.00 m to 5.00 m	
18.	Paved Shoulder	:	2.50 m	
19.	Earthen Shoulder	:	1.50 m	

Sr. No.	Particulars		Proposed Details
20.	Tunnels	:	Nil
21.	Embankment	:	Average height of embankment: > 3.0 m
22.	Service Road / Slip Road	:	1.5 m
23.	RWH structures		Rainwater harvesting structures are proposed at every 500 m interval throughout the alignment as per IRC: SP-50:1999 by taking Adequate measures.
24.	Plantation	:	Throughout

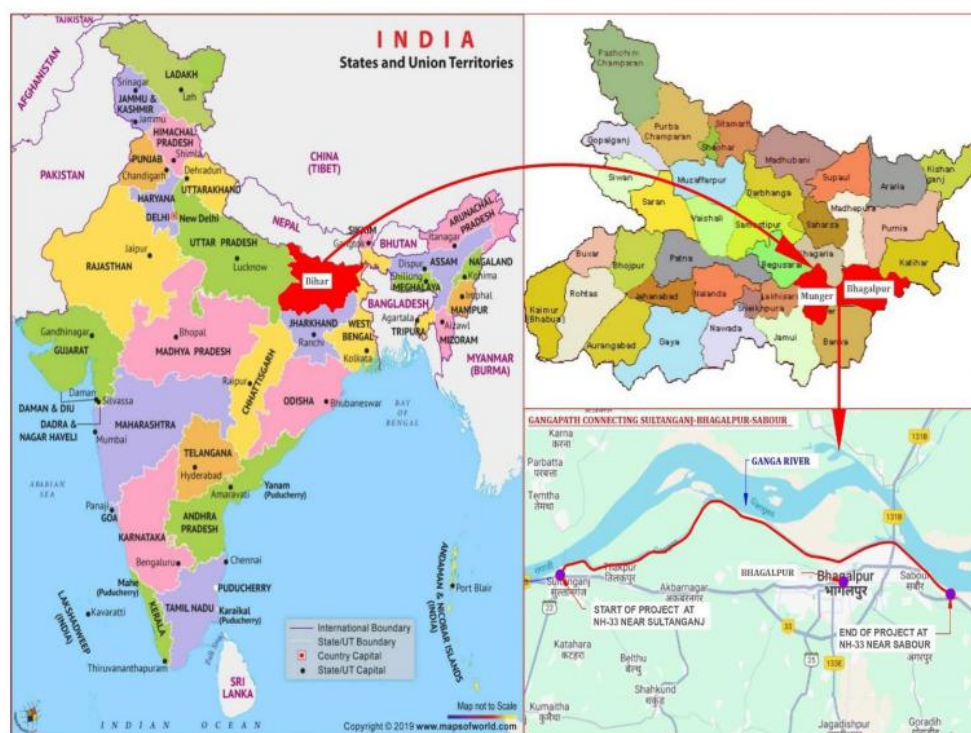


Figure 1-1: Index Map showing Location of the Project

1.4 Need of the project

The proposed 4-lane Greenfield At-Grade/Elevated Ganga Path from Sultanganj to Sabour, Bhagalpur has been envisaged to cater to the increasing transportation demand in eastern Bihar by providing a high-speed, safe, and efficient corridor along the southern bank of the River Ganga. The existing road network connecting Sultanganj, Bhagalpur, and Sabour is experiencing significant traffic congestion due to rapid urbanization, increasing commercial and industrial activities, and growing passenger and freight movement. As the existing roads pass through densely populated settlements with mixed traffic conditions, numerous intersections, and limited capacity, they are characterized by reduced travel speeds, longer travel times, higher vehicle operating costs, and increased road safety concerns.

The proposed greenfield corridor is designed to overcome these limitations by providing seamless connectivity between major urban centres and intermediate settlements while improving access to railway stations, industrial areas, educational institutions, tourism destinations, river ghats, and future urban developments. With a design speed of 100 kmph, the access-controlled facility will substantially reduce travel time, fuel consumption, and vehicle operating costs by minimizing delays caused by congestion, urban traffic, and geometric deficiencies. The project will also divert through traffic, particularly heavy commercial vehicles, away from congested town centres, thereby reducing traffic congestion, improving urban mobility, and enhancing road safety for local communities.

The incorporation of elevated sections, grade-separated intersections, and modern geometric design standards will significantly improve operational safety by reducing conflict points and accident risks. In addition, the corridor will facilitate efficient movement of agricultural produce, industrial goods, and other commodities, thereby strengthening regional logistics, promoting industrial growth, and supporting economic development in the project influence area. Improved connectivity to important religious and tourist destinations, particularly Sultanganj, the origin of the internationally renowned Shravani Kanwar Yatra, is expected to promote tourism, pilgrimage, and associated economic activities.

The proposed Ganga Path has also been planned to integrate with the existing and proposed network of National Highways, State Highways, bridges, and future transport infrastructure, thereby enhancing the overall regional transportation system. Adoption of a greenfield alignment, along with selective elevated stretches, has been aimed at minimizing displacement of settlements, reducing interference with existing urban infrastructure, limiting land acquisition, and avoiding critical utilities to the extent feasible. Furthermore, the elevated sections will enhance connectivity during flood events that frequently affect the Ganga basin, ensuring uninterrupted movement of emergency services, disaster response teams, and essential supplies.

Beyond transportation benefits, the project is expected to act as a catalyst for planned urban expansion, industrial development, logistics parks, warehousing, commercial activities, and employment generation, thereby contributing to balanced socio-economic development in the Bhagalpur district. As a strategically important infrastructure project under the Government of Bihar's long-term transportation development programme, the 41.258 km long 4-lane Greenfield At-Grade/Elevated Ganga Path will significantly improve east-west mobility along the Ganga, enhance regional connectivity, reduce travel time and logistics costs, improve road safety, and support sustainable economic growth while providing a resilient and environmentally responsible transportation corridor for eastern Bihar.

1.5 Benefits of project alignment

The proposed 4-lane Greenfield At-Grade/Elevated Ganga Path from Sultanganj to Sabour (Bhagalpur) has been carefully planned to establish a high-capacity, safe, and resilient transportation corridor along the southern bank of the River Ganga. The selected alignment has

been optimized based on engineering, environmental, social, and economic considerations to ensure efficient connectivity while minimizing adverse impacts on existing settlements and environmentally sensitive areas. The project is expected to deliver substantial direct benefits, including improved regional connectivity, reduced travel time, enhanced road safety, lower vehicle operating costs, and improved freight mobility, as well as indirect benefits such as accelerated socio-economic development, increased investment opportunities, employment generation, promotion of tourism and pilgrimage, improved disaster resilience, and balanced regional development. Collectively, these benefits will contribute significantly to the sustainable infrastructure development and long-term economic growth of Bhagalpur district and the eastern region of Bihar.

1.6 Demand & Supply Gap

Not applicable

1.7 Import Vs Indigenous Production

Not applicable

1.8 Export Possibilities

Not applicable

1.9 Employment Generation Due to Proposed Project

Direct Employment

During the construction phase manpower will be needed to take the part in various project activities. Skilled, semi-skilled and unskilled labours, will likely get work. In the post construction phase, it is expected that the project will provide social benefits to local people in terms of direct employment by way of better commercial and industrial development of the area.

Indirect Employment

The project shall also induce indirect employment for cleaners, guards, local vendors, operation and maintenance workers etc. Local vendors, construction material traders, electrician, plumbers etc. will be benefitted through employment generated during construction and maintenance phase.

Chapter 2. Project Description

2.1 Type of project including interlinked and interdependent projects, if any

Not applicable

2.2 Location (map showing general location, specific location and project boundary and project site layout) with coordinates

The proposed project involves the construction of a 4-Lane At-Grade/Elevated Ganga Path connecting Sultanganj – Bhagalpur – Sabour under the Hybrid Annuity Mode (HAM). The project is being implemented by the Bihar State Road Development Corporation Limited (BSRDCL) in the Munger and Bhagalpur districts of Bihar. The total length of the proposed greenfield corridor is 41.258 km, comprising 30.518 km of at-grade section and 10.740 km of elevated section. The alignment traverses through 41 villages in Bhagalpur District. The latitude & longitude of proposed alignment are given in **Error! Reference source not found..**

Table 2-1: Geographical Location of the alignment

S. No.	Latitude	Longitude
1.	25°14'57.195" N	86°43'43.818" E
2.	25°15'14.017" N	86°44'06.148" E
3.	25°15'20.286" N	86°44'32.325" E
4.	25°15'24.233" N	86°45'13.212" E
5.	25°15'09.549" N	86°45'35.296" E
6.	25°14'58.367" N	86°45'31.901" E
7.	25°15'15.587" N	86°46'35.022" E
8.	25°15'22.459" N	86°47'49.142" E
9.	25°15'45.393" N	86°48'42.964" E
10.	25°15'46.759" N	86°49'19.739" E
11.	25°16'52.440" N	86°51'02.109" E
12.	25°17'43.639" N	86°51'46.091" E
13.	25°17'50.585" N	86°52'30.385" E
14.	25°17'32.474" N	86°53'08.402" E
15.	25°17'11.824" N	86°53'40.426" E
16.	25°16'09.237" N	86°56'10.690" E
17.	25°15'58.843" N	86°56'28.026" E
18.	25°14'37.052" N	86°55'22.533" E
19.	25°14'29.026" N	86°55'11.807" E
20.	25°14'25.567" N	86°55'29.281" E
21.	25°15'48.841" N	86°56'45.264" E

S. No.	Latitude	Longitude
22.	25°15'26.105" N	86°58'34.655" E
23.	25°15'45.308" N	86°59'30.953" E
24.	25°16'02.608" N	87°00'21.937" E
25.	25°16'11.037" N	87°01'02.114" E
26.	25°13'48.764" N	87°04'51.064" E
27.	25°13'55.370" N	87°04'34.359" E
28.	25°13'56.843" N	87°04'54.766" E
29.	25°15'00.641" N	87°03'18.906" E
30.	25°16'04.594" N	87°01'52.222" E



Figure 2-1: Key Map showing Location of the Project

2.3 Details of alternative sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

The analysis of alternatives for the project road has been carried out for “With Project Scenario” and “Without Project Scenario”, “With and Without Environment Management Plan”. It is found that Project is acceptable with Environment Management Plan. The minor adverse impacts would be manageable to an acceptable level by implementing Environmental Management Plan due this EIA with EMP has been considered an acceptable and justified option. In order to avoid land acquisition and effective connectivity to new bus stand and future metro route, the “With Project

Scenario”, has been found to be acceptable option. The current project will also divert the traffic bound for southern portion of the State as well reduce congestion.

2.4 Size & Magnitude of Operation

Table 2-2: Details of land acquisition

Name of the District	Name of the Taluka	Total area in Acre
Bhagalpur	Sultanganj	250.652
	Narayanpur	70.081
	Nathnagar	213.972
	Jagdishpur	39.347
	Sabour	94.772
Total		668.824

The TCS details are attached as Annexure – 1.

2.5 Project Description with Process Details

Alignment feature is given in **Table 1-1** of Chapter 1.

2.6 Raw material required along with estimated quantity

The highway construction will require minor minerals like stones, gravel, ordinary clay, ordinary sand, limestone, boulders, kankar, murum, brick earth, bentonite, road metals. As per MINES AND MINERALS (DEVELOPMENT AND REGULATION) ACT, 1957, excavation of minor minerals during construction of roads shall be executed after prior permit. Raw material details given in **Error! Reference source not found..**

Table 2-3: Raw Materials and Sources

Construction material	Quantity in MT	Source	Mode of transport	Distance from source in km
Stone	738432	Own Source	Road /Water	100
Aggregates	2000000	Own Source	Road/ Water	100
Sand	849000	Banka	Road	53
Bricks	215000	Bhagalpur	Local Kiln	8
Cement	451960	Jharkhand	Road	140
Steel	161171	Jamshedpur	Road/Rail	377
Bituminous	11543	Barauni	Road	98

2.7 Resource Optimization, Recycle/ Reused

Topsoil removed during cutting & filling will be kept aside for reuse in median development. Excavated material removed will be reused to maximum extent by reusing the same for filling low laying areas if any or in embankment. Else it will be used in filling other identified low lying areas.

Detailed quantification will be provided in EIA.

2.8 Requirement and Source of Water/Energy

Water:

It is estimated that during construction phase water demand will be approx. 186 KLD, Fresh water requirement is 64 KLD and Flushing water requirement is 32 KLD and about 90 KLD for site activities. The water shall be obtained from nearby surface/ground water with consent.

During operation phase water requirement will be workers and operations of toll plaza, water sprinkling and landscaping.

Energy:

Power requirement during construction phase will be met with LS D.G sets in case of non-availability of electric supply. For operational phase, Total power requirement is 1.0 MW which will be met through state electricity board. Provision of 6 DG sets of 250 KVA capacity for power backup.

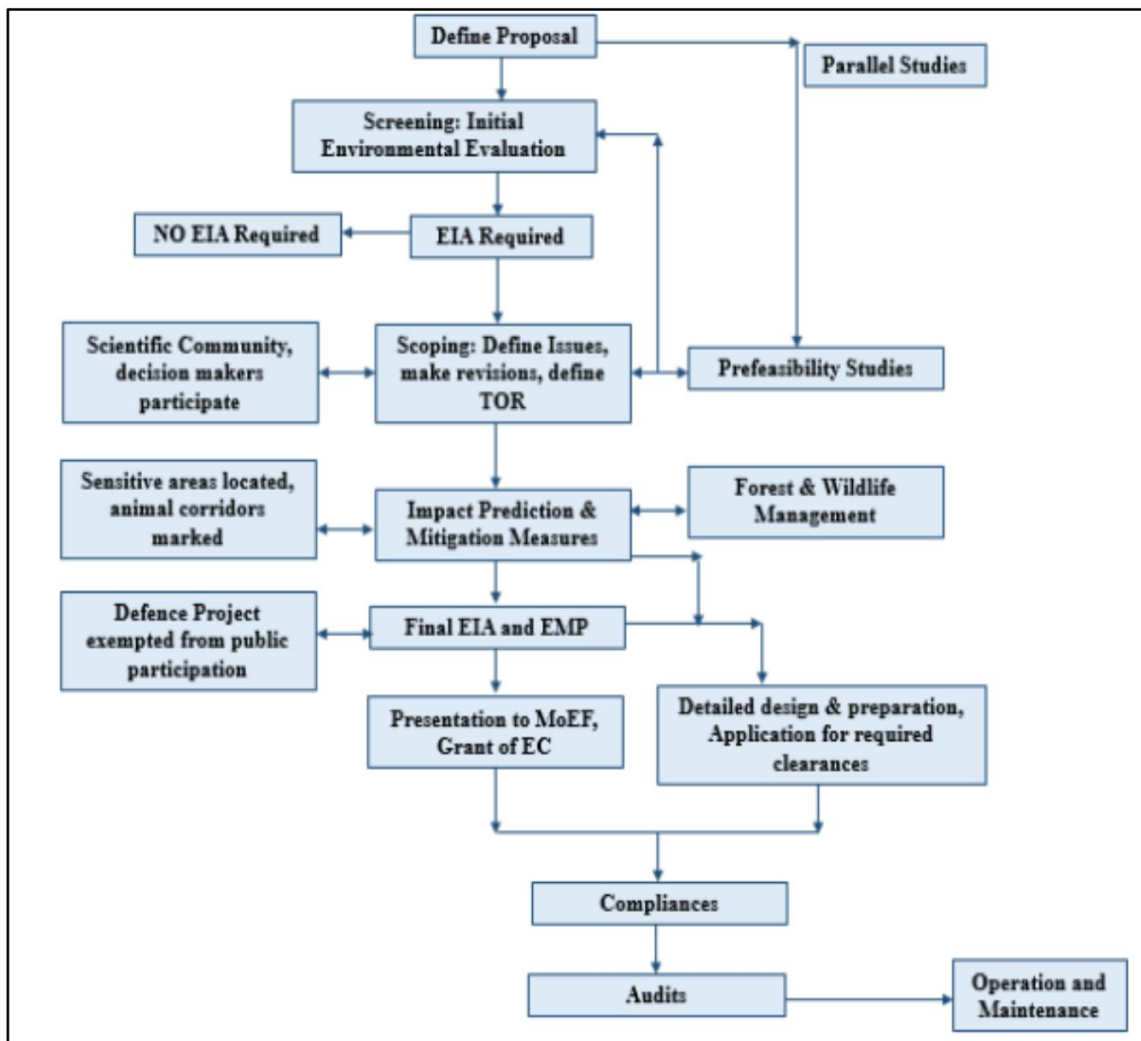
2.9 Quantity of Waste Generated

Debris generated during construction will be utilized to maximum extent for filling low lying area if any or in embankment development etc. Also, arrangements will be made by prospective contractors for disposal of solid waste. Movable/Bio toilets will be provided as sanitation facility wherever necessary while solid waste will be segregated and disposed as per MSW rules & regulations. During construction phase waste will be generated from labour colony and from working site. Total generated waste will be 173.74 TPA, out of which 69.35 TPA is biodegradable waste and 104.39 TPA is non-biodegradable waste. During operation phase waste generated will be approx. 7.3 TPA.

During operation phase the waste which will be collected and segregated at source by providing separate bins on site and will be handed over to local vendor for further processing.

Construction and demolition (C&D) waste generated during the construction phase shall be managed in accordance with the Construction and Demolition Waste Management Rules, 2025. The generated waste will be reused for backfilling and road development.

2.10 Schematic representation of the feasibility drawing of EIA



Chapter 3. Site Analysis

The proposed 4-lane Greenfield At-Grade/Elevated Ganga Path from Sultanganj to Sabour (Bhagalpur) has been planned to follow a detailed evaluation of alternative alignments to identify the most technically feasible, economically viable, environmentally acceptable, and socially sustainable corridor. Since the project is a linear transportation infrastructure, the concept of a "site alternative" is represented by alignment alternatives rather than different project sites.

During the planning stage, multiple alignment options were examined using satellite imagery, topographical maps, cadastral maps, field reconnaissance, and engineering surveys. The alternatives were assessed based on parameters such as engineering feasibility, terrain characteristics, land acquisition requirements, impacts on habitations, environmental sensitivity, proximity to protected areas, forests and wetlands, river crossings, flood-prone areas, existing utilities, religious and cultural properties, construction cost, traffic efficiency, and future development potential.

The preferred alignment was selected after balancing these technical, environmental, social, and economic considerations. The final alignment minimizes displacement of settlements and avoids environmentally sensitive areas, including forests, wetlands, and ecologically important habitats, to the extent practicable. Elevated sections have been proposed at critical locations to maintain natural drainage, reduce impacts on the Ganga floodplain, improve flood resilience, and minimize interference with existing infrastructure and built-up areas.

The selected alignment also provides optimum connectivity with existing National Highways, State Highways, district roads, bridges, and proposed transport infrastructure while ensuring safe and efficient traffic movement. Consequently, it represents the most suitable alternative, offering the best balance between transportation efficiency, environmental sustainability, social acceptability, engineering feasibility, and long-term regional development objectives.

Following are the general criteria adopted for the selection of the alignment:

- It should serve as uninterrupted traffic for proposed Tourist centres.
- It should provide linkage to other roads in the region.
- It should take in to account the future traffic growth and management.
- It should be coordinated with local and national development plans.
- It should minimize environment impact along the corridor.
- It should take in to consideration the opinions of local people in selection of alignment.

Accordingly, the selected alignment has been adopted as the preferred alternative for implementation, as it satisfies the project objectives while adhering to the principles of sustainable infrastructure planning and environmental management.

The alignment generally follows the southern bank of the River Ganga, traversing predominantly plain alluvial terrain and providing an important regional transport corridor connecting Munger and Bhagalpur. The salient feature of the proposed project is as provide in **Table 1-1**.

3.1 Connectivity

The project road starts from Sultanganj Wards 01, 02, 03, and 08; Nawada; Tilakpur; Kalyanpur; Chaturbhujpur (Shankarchak); Sankar Chowk; Tahawarnagar; Basantchak urf Basantpur; Baikatpur; Eusufpur; Mirzapur; Shahzadpur; Ajmeripur; Rattipur; Rasidpur; Serampur; Parnathpur; Darabpur; Barari; Fatehpur; Sabour; Kakan Kita; Nabipur; Bagder; Pharka; Habib Chowk; Meharban Chowk; Mathurapur; and Kalupur, together with Bhagalpur Municipal Corporation Wards 01, 03, 05, 18, 21, 22, and 24 ends at Sabour.

3.2 Landform, Land Use and Land Ownership

The preferred alignment traverses the alluvial plains of the Ganga basin, characterized by predominantly flat to gently undulating terrain with low relief. The elevation along the alignment varies gradually, with no significant hills or steep gradients. The area comprises fertile alluvial deposits interspersed with agricultural fields, rural settlements, riverine floodplains, drainage channels, and localized low-lying areas susceptible to seasonal inundation during the monsoon.

The proposed Right of Way (ROW) traverses a combination of agricultural land, fallow land, barren/open land, rural and peri-urban settlements, transportation corridors, water bodies, riverine areas, and limited commercial land uses. Agriculture constitutes the dominant land use along most sections of the alignment, with cultivation of seasonal crops supported by the fertile alluvial soils of the Ganga basin.

At locations passing near urban centres such as Sultanganj, Bhagalpur, and Sabour, the alignment encounters residential, commercial, and institutional developments. The corridor also intersects existing roads, railway lines, irrigation canals, natural drains, and utility corridors. The alignment has been optimized to avoid environmentally sensitive areas, dense habitations, and major public infrastructure to the maximum extent practicable while ensuring efficient connectivity.

The indicative land use categories along the project corridor include:

- Agricultural land (predominant)
- Fallow and barren land
- Residential and rural settlements

- Commercial and institutional areas
- Transportation corridors (roads and railways)
- River Ganga, tributaries, canals, ponds, and drainage channels
- Open spaces and scrubland
- Limited plantation and vegetation patches

Detailed land use analysis has been carried out using satellite imagery, field verification, and revenue records to support the alignment design and environmental assessment and will be given in EIA.

3.3 Topography

Geomorphologically, Bhagalpur district forms part of the Mid-Ganga Foreland Basin. The northern and central parts, lying to the north and south of the Ganga respectively, comprise flat Indo-Gangetic alluvial tracts—the northern section belonging to the North Bihar Plains and the southern to the Central Bihar Plains. The southern fringe transitions into a marginal alluvial tract. The general elevation of these alluvial areas remains within 45 m above mean sea level, with the master slope on both sides directed towards the Ganga River. Scattered across the plains are isolated Pre-Cambrian hard rock inliers, which rise prominently above the surrounding terrain; the highest of these is at Shahkund (143 m). This combination of fertile alluvial plains, low-lying flood-prone diara lands, and occasional rocky uplifts shapes the district’s agricultural potential and settlement patterns.

The district’s river network—dominated by the Ganga, along with tributaries like the Kosi, Chandan, Kadwa, Garha, and Bhadua—plays a critical role in shaping its topography, soil fertility, and flood patterns. Seasonal flooding replenishes soil nutrients but also poses challenges for infrastructure and settlement stability.

The preferred alignment is characterized by predominantly flat to gently sloping terrain with very low relief, typical of the Ganga floodplain. The ground elevation gradually decreases towards the River Ganga, with minor undulations caused by natural levees, abandoned channels, floodplain depressions, and agricultural fields.

The alignment runs broadly parallel to the southern bank of the River Ganga and passes through extensive agricultural lands, rural settlements, riverine floodplains, and peri-urban areas. The terrain is composed mainly of deep alluvial deposits of sand, silt, clay, and gravel, which have been deposited over time by the Ganga and its tributaries. Owing to the low-lying nature of the area, certain stretches are prone to seasonal flooding and waterlogging during the southwest monsoon.

The topography is favourable for highway development as it requires comparatively limited earthwork and facilitates the adoption of standard geometric design. However, the presence of

flood-prone areas, natural drainage channels, irrigation canals, and river crossings has been carefully considered in the alignment planning. Elevated sections, bridges, culverts, and adequate cross-drainage structures have been incorporated at appropriate locations to maintain natural drainage patterns, ensure hydraulic continuity, minimize impacts on the Ganga floodplain, and enhance the resilience of the corridor against flood events.

Overall, the relatively level topography provides suitable conditions for the construction and long-term operation of the proposed highway while enabling efficient connectivity with minimal engineering constraints.

There are 4 nos. of major bridges and 2 nos. of minor bridges. 67 no of Culverts are proposed on rivers and streams crossing the alignment.

3.4 Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ), shortest distances from the periphery of the project to periphery of the forests, national park, wildlife sanctuary, eco-sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

As per the preliminary investigation it is found that the project road traverses through the villages mentioned as below:

Sr. No.	Chainage (Km) From	Chainage (Km) To	Village Name	Sub District	District
1.	0+000	0+800	Sultanganj Ward 01	Sultanganj	Bhagalpur
2.	0+800	1+400	Sultanganj Ward 02	Sultanganj	Bhagalpur
3.	1+400	2+200	Sultanganj Ward 03	Sultanganj	Bhagalpur
4.	2+200	3+300	Sultanganj Ward 08	Sultanganj	Bhagalpur
5.	3+300	4+100	Nawada	Sultanganj	Bhagalpur
6.	4+100	7+900	Tilakpur	Sultanganj	Bhagalpur
7.	7+900	9+700	Kaleanpur	Sultanganj	Bhagalpur
8.	7+700	11+800	Chatarbhujpur (Shankarchak)	Sultanganj	Bhagalpur
9.	11+800	12+100	Sankar Chowk	Sultanganj	Bhagalpur
10.	12+100	13+000	Tahawarnagar	Sultanganj	Bhagalpur
11.	13+000	14+500	Basantchak urf Basantpur	Sultanganj	Bhagalpur
12.	13+000	14+400	Baikatpur	Narayanpur	Bhagalpur
13.	14+400	15+200	Eusufpur	Narayanpur	Bhagalpur
14.	15+200	17+400	Mirzapur	Narayanpur	Bhagalpur
15.	17+400	18+700	Shahzadpur	Narayanpur	Bhagalpur
16.	18+700	22+500	Ajmeripur	Nathnagar	Bhagalpur

17.	22+500	23+600	Rattipur	Nathnagar	Bhagalpur
18.	23+600	24+400	Rasidpur	Nathnagar	Bhagalpur
19.	24+400	25+600	Serampur	Nathnagar	Bhagalpur
20.	25+300	25+600	Bhagalpur Ward 18	Nathnagar	Bhagalpur
21.	25+600	26+500	Parnathpur	Nathnagar	Bhagalpur
22.	25+600	27+400	Rattipur	Nathnagar	Bhagalpur
23.	27+400	28+600	Darabpur	Nathnagar	Bhagalpur
24.	28+600	30+000	Bhagalpur Ward 05	Jagadishpur	Bhagalpur
25.	30+000	32+300	Bhagalpur Ward 03	Jagadishpur	Bhagalpur
26.	32+300	34+700	Bhagalpur Ward 01	Jagadishpur	Bhagalpur
27.	34+700	35+500	Barari	Sabor	Bhagalpur
28.	35+500	36+600	Fatehpur	Sabor	Bhagalpur
29.	36+600	38+500	Sabour	Sabor	Bhagalpur
30.	38+500	38+700	Kkan Kita	Sabor	Bhagalpur
31.	38+700	39+100	Nabipur	Sabor	Bhagalpur
32.	39+100	39+900	Bagder	Sabor	Bhagalpur
33.	39+900	41+300	Pharka	Sabor	Bhagalpur
34.	0+000	2+100	Serampur	Nathnagar	Bhagalpur
35.	2+100	2+700	Bhagalpur Ward 24	Jagadishpur	Bhagalpur
36.	2+100	2+700	Habib Chowk	Nathnagar	Bhagalpur
37.	2+800	3+100	Bhagalpur Ward 22	Jagadishpur	Bhagalpur
38.	2+800	3+100	Meharban Chowk	Nathnagar	Bhagalpur
39.	3+100	3+200	Mathurapur	Nathnagar	Bhagalpur
40.	3+200	3+524	Kalupur	Nathnagar	Bhagalpur
41.	3+200	3+451	Bhagalpur Ward 21	Jagadishpur	Bhagalpur

The preferred alignment traverses the alluvial plains of the Ganga basin, characterized by predominantly flat to gently undulating terrain with low relief. The proposed Right of Way (ROW) traverses a combination of agricultural land, fallow land, barren/open land, rural and peri-urban settlements, transportation corridors, water bodies, riverine areas, and limited commercial land uses. At locations passing near urban centres such as Munger, Bariyarpur, Sultanganj, Bhagalpur, and Sabour, the alignment encounters residential, commercial, and institutional developments. The corridor also intersects existing roads, railway lines, irrigation canals, natural drains, and utility corridors. Details of Land use breakup will be described in EIA.

Also, the alignment is passing through the Eco-Sensitive Zone (ESZ) of the Vikramshila Gangetic Dolphin Sanctuary hence, NBWL Clearance will also be applicable. Detailed information shall be furnished in EIA Report.

3.5 Existing Infrastructure

The social infrastructure like educational facilities (primary and higher secondary schools, Degree College), drinking water supply, post office, public transportation are available in the nearby town. Details will be given in EIA.

3.6 Soil Classification

The area is predominantly characterized by deep alluvial soils deposited by the Ganga River and its tributaries. The soil is generally sandy loam to silty loam, with patches of clay loam in low-lying areas. These soils are moderately fertile, well-drained to moderately drained, and are extensively used for agricultural activities. The geotechnical characteristics are generally suitable for road construction, subject to detailed site-specific investigations and appropriate pavement design.

3.7 Climatic data from secondary sources

Bhagalpur experiences subtropical torrential rain and moist climate. The summer season in Bhagalpur starts from March continues till June. May is considered hottest month when temperature could rise upto 45°C. Though it is relatively cool during evening but moisture in the air makes the atmosphere humid and relatively uncomfortable. Monsoon arrives by July and continues till the month of September. The sky remains cloudy with pleasant rainfall during the period of June to September when temperature ranges between 30 and 33° C. However, the winter season demands woollen clothes, jackets and sweaters from travellers as it falls in between December and February month. The season is typically cool and has a lovely environment. Minimum temperature during winter remains 11° C, while the maximum is 33° C.

3.8 Social Infrastructure Available

The alignment passing through **Bhagalpur district** is supported by a well-developed network of social infrastructure, including educational institutions, healthcare facilities, administrative offices, banking services, markets, public utilities, and transportation infrastructure. Major towns such as Sultanganj, Bhagalpur, and Sabour provide access to schools, colleges, hospitals, Primary Health Centres (PHCs), Community Health Centres (CHCs), railway stations, bus terminals, and other essential civic amenities. The region is also characterized by important religious and cultural destinations, particularly Sultanganj, a major pilgrimage centre associated with the Shravani Kanwar Yatra. The proposed highway will enhance accessibility to these facilities by improving regional connectivity, reducing travel time, strengthening emergency services, and supporting the overall socio-economic development of the project influence area.

Chapter 4. Planning Brief

4.1 Planning Concept (type of industries, facilities transportation etc.) Town and Country Planning/ Development authority Classification

Not Applicable

4.2 Population Projection

Not Applicable

4.3 Land use planning (breakup along with green belt etc.)

The proposed Right of Way (ROW) traverses a combination of agricultural land, fallow land, barren/open land, rural and peri-urban settlements, transportation corridors, water bodies, riverine areas, forest land and limited commercial land uses. Agriculture constitutes the dominant land use along most sections of the alignment, with cultivation of seasonal crops supported by the fertile alluvial soils of the Ganga basin.

The area falling under the proposed Right of Way (ROW) passes through forest area and agricultural land, hence there will be permanent change in the land use from forest to non-forest land and from agricultural to non-agricultural land. Details of Land use breakup will be described in EIA.

4.4 Assessment of Infrastructure Demand (Physical & Social)

Not Applicable

4.5 Amenities / facilities

The amenities proposed during operation phase are toll plaza, administrative buildings, weighing stations, parking areas & rest areas and office cum residential complex of PIU. The toll plaza location will be selected based on the traffic studies and a study of the existing physical features including the availability of land & designed as per IRC 84.

Chapter 5. Proposed Infrastructures

5.1 Industrial Area (Processing Area)

Not applicable

5.2 Residential Area

The start and end chainages, there are existing villages.

5.3 Greenbelt Development

Greenbelt Development shall be done as per Green Highway (Plantation and Maintenance) policy and Green Highways (Plantation Trans-plantation beautification and Maintenance) policy 2015.

5.4 Social Infrastructure

Not Applicable

5.5 Connectivity

	Aerial Distance (km)
Nearest Railway Station	Sultanganj Railway Station ~ 1.09 km towards SE Bhagalpur Railway Station ~ 1.66 km towards S Sabour Railway Station ~ 1.50 km towards SW
Nearest Airport	Purnea Airport ~ 66.70 km towards NE
Nearest Village	Sultanganj – Adjacent to project site towards S Bhagalpur – Adjacent to project site towards S Sabour – Adjacent to project site towards S
Nearest Highway/ Roads	NH - 33 – Adjacent to project site towards S NH -131B – Crossing project site at Bhagalpur

5.6 Drinking Water Management (Source and Supply of Water)

It is estimated that during construction phase water demand will be approx. 186 KLD, Fresh water requirement is 64 KLD and Flushing water requirement is 32 KLD and about 90 KLD for site activities. The water shall be obtained from nearby surface/ground water with consent. During operation phase water requirement will be workers and operations of toll plaza, water sprinkling and landscaping. Details will be furnished in EIA report.

5.7 Sewerage System

Bio toilets will be provided for the workers in construction phase. Details will be furnished in EIA report.

5.8 Industrial Waste Management

Not Applicable

5.9 Solid Waste Management

Debris generated during construction will be utilized to maximum extent for filling low lying area if any or in embankment development etc. Also, arrangements will be made by prospective contractors for disposal of solid waste. Movable/Bio toilets will be provided as sanitation facility wherever necessary while solid waste will be segregated and disposed as per MSW rules & regulations. During construction phase waste will be generated from labour colony and from working site. Total generated waste will be 173.74 TPA, out of which 69.35 TPA is biodegradable waste and 104.39 TPA is non-biodegradable waste. During operation phase waste generated will be approx. 7.3 TPA.

During operation phase the waste which will be collected and segregated at source by providing separate bins on site and will be handed over to local vendor for further processing.

Construction and demolition (C&D) waste generated during the construction phase shall be managed in accordance with the Construction and Demolition Waste Management Rules, 2025. The generated waste will be reused for backfilling and road development.

Details will be furnished in EIA report.

5.10 Power Requirement/ Supply/Source

Power requirement during construction phase will be met with LS D.G sets in case of non-availability of electric supply. For operational phase, Total power requirement is 1.0 MW which will be met through state electricity board. Provision of 6 DG sets of 250 KVA capacity each for power backup. During operational phase, electrical supply will be used wherever available.

Chapter 6. Rehabilitation and Resettlement (R&R) Plan

6.1 Policy to be adopted (Central/State) in respect of the project affected persons including home oustees, land oustees and landless laborers (a brief outline to be given).

Implementation of the proposed alignment may require acquisition of private land and may result in impacts on landowners, residential structures, commercial establishments, and livelihood sources. To address such impacts in a fair and transparent manner, land acquisition, rehabilitation, and resettlement (R&R) shall be undertaken in accordance with the applicable Central and State Government policies and statutory provisions.

The project will adopt the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013), which provides a comprehensive framework for land acquisition, payment of fair compensation, rehabilitation, and resettlement of affected families. The Act ensures that affected persons receive compensation based on market value along with applicable solatium and rehabilitation assistance, while safeguarding their social and economic interests.

Where applicable, the project shall also comply with the relevant provisions of the National Highways Act, 1956 (as amended), Government of Bihar policies, and notifications issued by the Road Construction Department and Revenue & Land Reforms Department relating to land acquisition and resettlement.

The budget is already included in the land acquisition portion for the same.

Chapter 7. Project Schedule and Cost Estimation

7.1 Likely date of start of construction and likely date of completion

The construction of the proposed project shall commence after the finalization and approval of the Detailed Project Report (DPR), obtaining the Environmental Clearance (EC) from the Ministry of Environment, Forest and Climate Change (MoEF&CC), and securing all applicable statutory approvals, including the recommendation of the National Board for Wildlife (NBWL) and the grant of Stage-I Forest Clearance under the Forest (Conservation) Act, 1980 (as amended). Subsequently, compliance with all Stage-I Forest Clearance conditions shall be ensured, and the requisite Working Permission shall be obtained from the concerned Chief Conservator of Forests (CCF)/competent Forest Department authority before undertaking any construction activity involving forest land. Construction shall commence only after obtaining all statutory clearances, permissions, and approvals required under the applicable Central and State Government regulations.

7.2 Estimated project cost along with analysis in terms of economic viability of the project.

The estimated capital cost of the project is ₹4993 Crore.

Chapter 8. Analysis of proposal (Final Recommendations)

8.1 Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

The project will have multiple benefits. It will reduce the travel time substantially. In addition, the improved road will provide other benefits like proposed activity improves the economic status of the village people along project area. Overall improvement will be expected in terms of;

- The project will improve road connectivity between towns and villages.
- It will reduce travel time, vehicle operating costs, and fuel consumption.
- The project will facilitate faster movement of people and goods, thereby promoting economic development.
- Employment opportunities will be generated for local people during the construction and operation phases.
- Improved road infrastructure will enhance access to schools, hospitals, markets, and other essential public services.
- Better connectivity will support the growth of local businesses and tourism.
- Road safety will be improved through the provision of proper road signs, markings, crash barriers, and other safety features.
- The project will contribute to the socio-economic development and improve the quality of life of the people in the project area.