



## **PRE – FEASIBILITY REPORT**

**Development of 8 lane (Greenfield Highway) from Firozpur Jhirka (Ch. 79.394 Km) to Etawa (Ch. 284.000 Km) Section of NH-148 N (Total length 204.606 Km), Under BHARATMALA PRIYOJANA Lot-4/Pkg-4 in the state of Rajasthan.**

**June 2018**

## **DISCLAIMER**

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It is, however, to be noted that this report has been prepared in best faith, with assumptions and estimates considered to be appropriate and reasonable but cannot be guaranteed. There might be inadvertent omissions/errors/aberrations owing to situations and conditions out of the control of NHAI and DPR Consultant. Further, the report has been prepared on a best-effort basis, based on inputs considered appropriate as of the mentioned date of the report.

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## **1. EXECUTIVE SUMMARY**

Government of India has decided to develop ~42,000 km of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under the Bharatmala Pariyojana. One of the projects of the Bharatmala Pariyojana is Delhi-Mumbai Greenfield Highway via Jaipur and Vadodara. The project being discussed under this report concerns a section of the proposed green-field highway under Bharatmala Pariyojana Lot 4 / Package 4: Rajasthan – Haryana Border to Kota. The Project is planned as an 8-lane green-field highway.

The Project shall start from Haryana - Rajasthan Boarder at Chainage 79.394 km (27°39'13.12"N, 76°57'46.62"E) near Firozpur Jhirka and traverses entirely through plain / rolling terrain in Rajasthan state and ends near Etawa village at Chainage 284.000 (26°01'57.27"N 76°15'42.06"E) km of Sawai Madhopur district, Rajasthan. Total length of the proposed Section is about 204.606 Km.

The project proponent for the Project is National Highways Authority of India (NHAI).

As per MoEF&CC EIA Notification 2006, the proposed Project is covered under schedule '7f - Category A', wherein submission of the Environment Impact Assessment Report to the Ministry of Environment, Forest and Climate Change (MoEF&CC), New Delhi is a pre-requisite to obtain Environmental Clearance.

This Pre-feasibility Report is a part of the application being made for the grant of Terms of Reference (TOR) for conducting the EIA studies for the proposed section of Lot-4/Pkg-4.

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## 2. INTRODUCTION TO THE PROJECT

### 2.1 Project Proponent

National Highways Authority of India (NHAI), an autonomous agency of the Government of India, is responsible for management of a network of national highways across the country. It is a nodal agency of the Ministry of Road Transport and Highways (MoRTH), Government of India. Its vision is to meet the nation's need for the provision and maintenance of national highways network to global standards and to meet user expectations in the most time-bound and cost-effective manner, within the strategic policy framework set by the Government of India and thus promoting economic well-being and quality of life of the people.

NHAI shall be the nodal authority/ proponent for the development of this Project.

### 2.2 Project Brief

Government of India has decided to develop ~42,000 km of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under the Bharatmala Pariyojana. Delhi-Mumbai Greenfield Highway via Jaipur, Kota and Vadodara is also covered under Bharatmal Pariyojana. The project being discussed under this report concerns a section of the proposed green-field highway under Bharatmala Pariyojana Lot 4 / Package 4: Rajasthan – Haryana Border to Kota.

Project alignment shall start near Firozpur Jhirka. The proposed alignment runs through the Alwar, Bharatpur, Dausa and Sawai Madhopur districts before ending near Itawa village in Sawai Madhopur district. Overall, the Project is an 8-lane highway with a length of ~204.606 km. Salient features of the Project are as follows.

**Table 1: Project Salient Features**

Sl. No.	Particular	Details
1	Project Name	Development of 8 lanes (Greenfield Highway) from Firozpur Jhirka (Ch. 79.394 Km) to Etawa (Ch. 284.000 Km) Section of NH-148 N (Total length 204.606 Km), Under BHARATMALA PRIYOJANA Lot-4/Pkg-4 in the state of Rajasthan.
2	Nature of Project	8-lane, access-controlled Greenfield Highway
3	Location of project stretch	This section starts near Firozpur Jhirka and ends near Itawa village. It passes through Alwar, Bharatpur, Dausa and Sawai Madhopur districts in Rajasthan
4	Geographical Coordinates	27°39'13.12"N, 76°57'46.62"E to 26°01'57.27"N, 76°15'42.06"E
5	Land details	Proposed highway follows partly plain, rolling and mountainous terrain. Bandikui Protected forest and settlement areas shall also get affected
6	Water demand	12,683 ML water will be required during construction phase.
7	Sources of water	Tanker Supply
8	Nearest railway station	Biwai Railway Station- 3.2 km (Chainage 147.200 km) Bandikui Railway Station- 4.0 km (Chainage 159.500 km)
9	Nearest state highway / National Highway	Proposed alignment is crossing SH-45, SH-14, SH-44, SH-25A, SH-25, SH-24, NH-11, NH-11A
10	Nearest airport	Jaipur Airport- Approx. 52.0 km
11	Seismic Zone	Proposed alignment falls under Seismic Zone II and III. Initial 160 km part i.e. Chainage 79.394 Km to 239.00 Km falls in Zone – II, while Chainage 240.000 Km to 284.00 Km lies in Zone III. Zone II is most stable and Zone - V is considered to be least stable. Proposed alignment is located in High Damage Risk Zone (Vb = 47 m/s) as



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Sl. No.	Particular	Details
		per Wind and Cyclone Hazard Classification of India.

### 2.3 Project Need and Importance

The Project is a part of the proposed 8-lane access-controlled Greenfield Delhi-Mumbai highway corridor (~1,335 km) interlinking different State & National highways while connecting Delhi to Mumbai. The Project is planned as an ambitious high-speed corridor which provide high speed connectivity between states of North India and states of West & South India, more importantly giving a reliable access to the country's prominent economic and social hubs like Mumbai, Delhi, Vadodara, Jaipur, Kota etc.

The proposed highway will provide better connectivity to several towns and cities viz. Gurgaon, Alwar, Dausa, Sawaimadhopur, Bundi, Kota, etc. and give an infrastructure fillip to the states of Delhi, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra. The highway will be access-controlled and ensure high speed traffic movement from Delhi to Mumbai. The proposed alignment is selected so as to cover one of the most important North-South arterial connectivity in the country, further interspersed with feeder highways on its either sides.

At present, the connectivity between Delhi and Mumbai is either via NH-48 or via NH-19 & NH-47, which are 4/6 lane. The new proposed highway shall bring down the travel distance by approximately 95 Km (as compared to alternate routes) and result in time savings of over 2 hours. Moreover, the new highway facility is access controlled and hence will provide good riding quality, better safety, and a reliable infrastructure. All of these elements will result in cost savings and efficiency improvement.

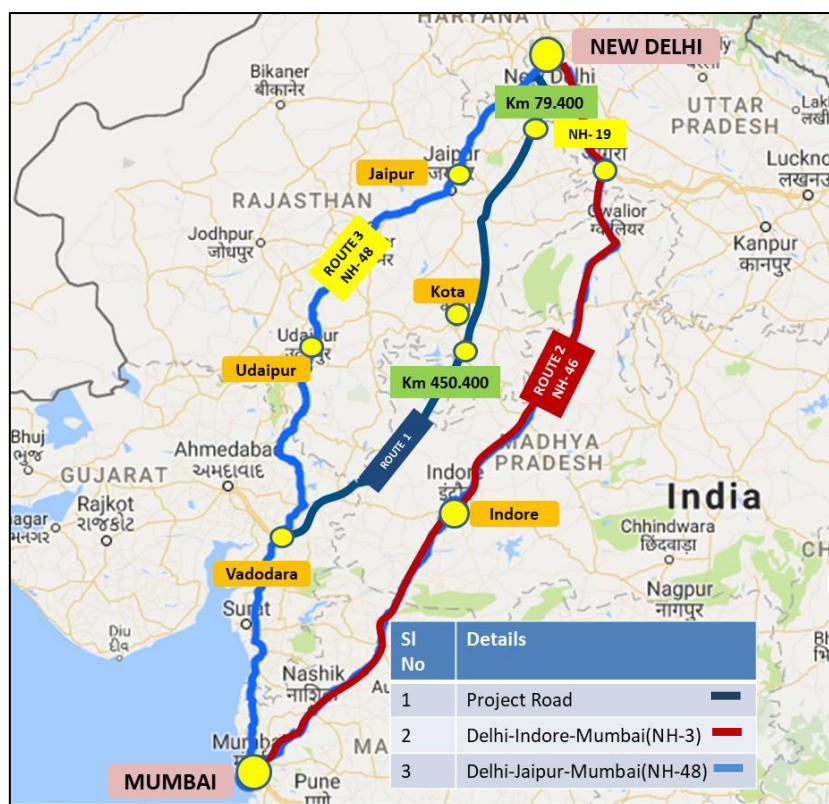


Figure 1: Route map of proposed Project vs. existing road network

The Project will further have following benefits at national and regional level:

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- **High-speed connectivity and access:** The projected corridor is a proposed 8-lane, access-controlled highway. This will avoid traffic congestion and speed-up the freight movement. It is expected that overall, the proposed Delhi-Mumbai corridor will reduce the travel time between the two economic hubs by half.
- **Aiding economic growth:** The seamless connectivity will provide better access to vehicles as a link to the National Highways. The Project will reduce travel time and provide boost to trade and commerce linked to the regions connected through this highway.
- **Growth of backward areas:** The biggest strength of the alignment is that it plans to cover backward districts of Rajasthan. As a result of connectivity and access to other parts of the country, these backward areas will be aided to integrate with other part of India. Further, freight and passenger traffic on the highway will help promoting ancillary economy of these regions.
- **Decongestion of existing National and State Highways:** The proposed corridor will take away traffic pressures from existing SH and NH passing through various cities. Also, long-distance traffic will shift to the proposed highway, thereby leaving the NH and SH for regional and local usage.
- **Usage shift:** Long-distance traffic will shift from existing National Highways to the proposed highway, resulting in lesser congestion on these highways
- **Improved safety:** Due to access control, the Roadway & Travel Safety of the traffic connecting the cities will be enhanced as there will be minimum distractions & conflict zones
- **Support to industry:** Different types of industries like Manufacturing, Tourism etc. along the proposed corridor will be facilitated in their business operation and reachability.

Following major types of traffic load is expected on the Project:

- **Commercial and Industrial:** Traffic on the existing roads is driven by local, commercial and industrial traffic. Industries such as cement, chemicals and minerals are present along and around the proposed corridor as it traverses through Haryana, Rajasthan, Madhya Pradesh and Gujarat. These industries are expected to benefit from the highway.
- **Tourist:** Passenger traffic will be generated due to many places of tourist interest in the districts connected by the project corridor. Apart from places of historical importance such as forts and palaces, traffic would be augmented due to several famous religious places such as the Mehandipur Balaji Temple (Dausa) and wildlife parks and safari like Ranthambore National Park and Tiger Reserve.
- **Health and Education:** Faster connectivity and accessibility to Delhi NCR will help in higher flow of traffic from Rajasthan, especially for higher education, tertiary healthcare and specialized treatments. Reduction in travel time will allow patients to avail OPD / other medical services from the capital region.

## 2.4 Market Analysis

The proposed Project plans to link Delhi NCR to Jaipur, Kota, Vadodara and Mumbai. The strong regional connectivity proposed through the Project will further increase regional trade and economic growth. The regions to be connected through the Project have their distinct economic profiles:

- Delhi NCR has industrial catchment focused on agri and processed food, automotive & auto ancillary, home consumables, metals and minerals etc.
- Alwar district has several export focused units serving the pharmaceutical, healthcare, automotive and FMCG industries in its 27 designated industrial areas
- Dausa has more than 3500 small scale industrial units and 5 designated industrial areas. Major output is mineral and leather-based products. Many construction-linked small industries dot the district.
- Sawai Madhopur district has 3 government designated industrial areas. Clusters of MSMEs producing leather footwear and Marble figurines attract commercial traffic in the district.



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- Vadodara industrial belt is concentrated with industries like textiles, chemicals & petrochemicals, pharmaceuticals and bio-technology

These regions source their raw materials as well as transport their finished goods to various parts of the country. The corridor will provide efficient access to various markets by ensuring smooth flow of goods.

The highway will also support the local businesses and economy along the project corridor. It will facilitate small-scale industries such as Pharma and chemicals in Alwar, mineral and leather goods units in Dausa etc. by streamlining transport of raw and finished material. Alwar alone has 21 industrial areas with ~40,000 industrial employees. More than 70 allotted industrial areas in other connected districts also stand to benefit by use of the highway.

### 2.5 Demand & Supply Gap and Benefits

The demand for the proposed Project has been assessed across various parameters:

#### Reduction in Route Congestion:

A traffic study has been conducted across various locations of the proposed highway and the alternate routes. It has observed that the traffic along NH-48 (Delhi-Jaipur-Ajmer route) 30% higher than the IRC guidelines for highway ideal performance (Max. 60,000 PCUs) and is currently over-crowded with below acceptable Level of Service performance. The route currently being the main connector between Delhi and Mumbai, there is a strong need for finding alternate access between the two cities to ease connectivity and travel time.

As an alternate, it has observed that traffic on Alwar-Sawai Madhopur-Kota stretch (Average Annual Daily Traffic of less than 16,000 PCUs per day) within reasonable and accepted traffic standards. Hence, it may be used as optimum alignment for the proposed Delhi-Vadodara-Mumbai highway.

#### Savings in Travel Time and Cost:

The proposed highway is expected to reduce the distance to be travelled between Delhi-Mumbai by ~95 km, leading to the following cost savings for users:

- Vehicle Operation Cost (VOC)
- Travel Time (VOT)
- Toll costs

Initial estimates show savings of approximately INR 290 and INR 520 for car and heavy truck (MAV) respectively for the length of the section (~204.990 km) on each one-way trip.

#### Future Traffic Estimations:

It is estimated that because of reduction in travel time and costs, more traffic will be diverted from other routes. Further, more traffic will be generated from surrounding regions to add to the expected traffic on the proposed Project. It is estimated that across various sections of the project, the following traffic will be generated:

Table 2: Projected Traffic

Sl. No.	Stretch	Total Number of Vehicles	Total PCUs
1	Km 79.400 to Km 102.140	11,920	26,473
2	Km 102.140 to Km 128.900	10,286	24,188
3	Km 128.900 to Km 179.720	9,948	23,791
4	Km 179.720 to Km 209.842	6,886	20,558

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Sl. No.	Stretch	Total Number of Vehicles	Total PCUs
5	Km 209.842 to Km 229.172	6,842	20,457
6	Km 229.172 to Km 292.655	9,686	26,723

On an average, it is estimated that Average Potential Traffic Demand of ~23,500 PCUs (Passenger Car Units) per day shall be generated on the proposed section of Lot-4/Pkg-4. Growth and industrial development along the corridor will further induce more traffic in future.

### 2.6 Imports vs. Indigenous Production

No import requirement is expected as the Project is a highway (road project) and doesn't involve any manufacturing and production. The construction material for the highway will be sourced domestically.

### 2.7 Export Market

The Project being a roadway project, there is no direct impact on exports.

However, the connectivity improvements through the proposed Project shall have several indirect benefits. Proposed development will support freight traffic movement between North and South India, thereby aiding faster movement and transit of EXIM traffic to and from the connected region. Further, enhanced connectivity between regions and to West Indian Ports & International Air Cargo Hubs will also help in promoting trade and boosting export market for regional goods.

### 2.8 Employment Generation (Direct and Indirect)

The highway project is expected to generate employment during construction phase. It is estimated that ~1,200 direct employees will be required per day during construction of the highway. Further, due to ecosystem development, the highway will also create considerable indirect employment opportunities in form of transportation of construction materials, greenbelt development, ancillary facilities like canteens, dhabas etc.

During operations phase, the Project will largely have indirect employment benefits in form of highway amenities and through economic & social hubs developed around the highway. Efficient reach and connectivity to distant markets will further enhance economy of the districts and create employment opportunities.

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### 3. PROJECT DESCRIPTION

#### 3.1 Interlinked and Interdependent Project

The interlinked projects to the proposed section shall include the development of the Spur road connectivity to the Alwar district and connecting sections of Lot-4/Pkg-4: Haryana –Rajasthan Boarder to Kota Section. The details of the Interlinked and Interdependent project shall be provided in EIA report.

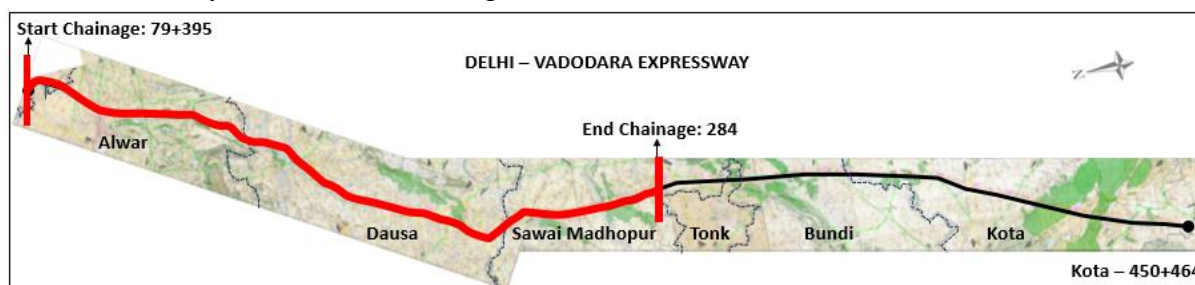
#### 3.2 Project Location

The proposed alignment of the project starts from Chainage 79.394 km near Firozpur Jhirka and ends near Itawa village at Chainage 284+000 km in Sawai Madhopur district of Rajasthan state. Geo-graphical Coordinates of start and end points are given in table below.

**Table 3: Project Coordinates**

Description	Coordinates
Starting point	27°39'13.12"N, 76°57'46.62"E
Terminating point	26° 01'57.27"N, 76°15'42.06"E

Location of the Project stretch is shown in **Figure 1** below.



**Figure 2: Project Chainage**

#### 3.3 Alternative Analysis

Three alignment options are considered in order to finalise the proposed alignment. All the three alignments are compared in terms of techno-commercial aspect consisting minimum tree felling, minimum exorbitant cost, comparatively lower land degradation and lesser environmental impacts. The detailed alternative analysis is uploaded under additional attachments of ToR Application.

#### 3.4 Size and Magnitude of Operation

The total length of the project is ~204.606 Km (Chainage: 79+394 Km to 284+000 Km) and RoW is 100m. This is a green-field project and the resultant impact area for this package is approximately 20.606 square Km.

#### 3.5 Project Description

The Project entails 8 lane access-controlled green-field highway. The alignment under the project starts near Haryana - Rajasthan Boarder at chainage 79.394 km (27°39'13.12"N, 76°57'46.62"E) near Firozpur Jhirka, which is in Haryana and traverses entirely through plain/ rolling terrain in Rajasthan state and ends near Itawa village at Chainage 284.000 Km (26° 1'57.40"N, 76°15'42.35"E) of Sawai Madhopur district. The Project road under present proposal covers Alwar, Bharatpur, Dausa and Sawai Madhopur in Rajasthan state. Total length of the Project is ~204.606 km and 100m Right of Way has been considered for proposed alignment.

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### 3.6 Raw Materials

The Project entails development of a green-field road and will require road construction materials. Construction material like aggregates, sand, stone, etc. shall be procured from nearby approved quarries. Separate environmental approval shall be sought for any new quarry. Quantity of the construction material required for the proposed 8 lane Project (Length: ~204.606 km) is given in table below.

**Table 4: RoW Material requirement**

S. No.	Description	Unit	Quantity
1	Earthwork	Cum	42,824,609
2	GSB	Cum	2,318,423
3	WMM	Cum	2,010,453
4	DBM	MT	2,168,267
5	BC	MT	927,976
6	Bitumen	MT	138,550
7	Emulsion	MT	8,728
8	Cement	MT	182,066
9	10 mm	Cum	558,991
10	20 mm	Cum	623,164
11	40 mm	Cum	310,864
12	Dust	Cum	857,828
13	Sand	Cum	193,278
14	Filler	MT	40,012
15	Steel	MT	47,073

### 3.7 Resource Optimization / Recycling and Reuse

The Project will reuse the soil and material excavated for construction of Bridges and other structure.

- Topsoil from the agriculture land shall be stored separately for utilisation in avenue and median plantation. The earth material excavated from the high-rise area shall be used for backfilling of low laying area and embankment.
- Sewage shall be routed through portable STP or diverted into the soak pit. Treated water from STP will be used for sprinkling or gardening.
- Waste oil shall properly store in HDPE drums and to be sold to recycling vendor approved by State Pollution Control Board (SPCB)

### 3.8 Water and Energy- Source and Availability

Rainfall is the major source of ground water recharge in the state. However, Rajasthan receives much lower rainfall compared to the other parts of the country. Out of the total rainfall, a sizable portion in the beginning of the rainy season is used for building the soil moisture and is also lost to evaporation because of its arid conditions.

As per the Central Ground Water Board (CGWB), the normal annual rainfall of Rajasthan is 549.1 mm. However, during the period from 2005 -14, highest average annual rainfall of the State in the year 2011 and lowest in the year 2009. The rainfall of the year 2014 is 20.8% less as compared to 2013. The state receives 90 % rainfall from southwest monsoon from June to September. The amount infiltrating through the soil mass to contribute to ground water storage is of the order of 5% to 7% in areas underlain by hard rocks and 10% to 15% in alluvial areas. (Source: Ground water Year Book 2014-2015).

The Aravalli Hills Ranges form main water divide in Rajasthan. Luni is the only river west of Aravallis. In the remaining area of western Rajasthan comprising about 60% of the geographical area of the state, the drainage

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is internal, and the streams are lost in the desert sands after flowing for a short distance from the point of origin. Luni itself essentially is an ephemeral stream with flood cycle of 16 years. Drainage in western Rajasthan is towards west and south - west.

The proposed project is falling in the east of Aravalli ranges the main drainage is towards north –east. The rivers of the Rajasthan are mostly seasonal with only two river basins (Chambal and Mahi) being perennial. The Chambal catchment occupies 23% of the total geographical area of the state. The proposed alignment is crossing the Ruparel, Palasan, Banganga, Banas Rivers and Sanwan Nadi, which are the main sources of the surface water in the project area.

**In addition to the Sub-Clause 111.8.3 of MoRTH Specifications,** The Contractor shall source the requirement of water preferably from surface water bodies, rivers, canals and tanks in the project area. Only at locations where surface water sources are not available, the Contractor can contemplate extraction of ground water, after intimation and consent from the CGWB.

To avoid disruption/disturbance to other water users, the Contractor shall extract water from fixed locations and consult the local people before finalizing the locations. The Contractor shall comply with the requirements of Rajasthan Ground Water Department and seek their approval for extraction of ground water.

Bore wells installed and used for the project shall be left in good operating condition for the use of local communities. The Contractor shall prevent any interference with the supply to or abstraction from, and prevent any pollution of, water resources as a result of the execution of the Works.

It is estimated that the Project will need ~12,683 ML water for construction phase. The water for the construction phase will be met by water tankers from approved vendors. Bore-well, if required, will be operated after approval from the competent authority.

Power, during construction, will be sourced from local distribution company. DG sets as alternative arrangement will also be arranged in construction camp.

### **3.9 Waste Quantity and Management**

Waste management shall be done as per Solid Waste Management Rules, **2016** and Construction and Demolition waste Management Rules, 2016.

### **3.10 Schematic Representations of the Feasibility Drawings**

Typical Cross Section Drawings is uploaded in additional attachments under section IV of ToR application. Detail alignment drawing shall provide in EIA report.

## 4. SITE ANALYSIS

### 4.1 Site Connectivity

The proposed route is well connected with the existing road infrastructure (including nearby National and State Highways) and is accessible through SH-45, SH-14, SH-44, SH-25A, SH-25, SH-24, NH-11 and NH-11A.

### 4.2 Land Form, Use & Ownership

The proposed Project covers ~204.606 km of length. Land uses identified along the proposed corridor are:

- Agricultural Land
- Built-up Land
- Forest Land
- Barren Land

The details of the land-use pattern will be given in the detailed EIA report. For the development of proposed highway ~2046 ha of land will be acquired in Alwar, Bharatpur, Dausa and Sawai Madhopur districts of Rajasthan. Majority of the land ownership is with farmers and other private entities.

### 4.3 Forest & Wildlife Area

According to the Forest Survey of India, the recorded forest area of the state is 32,737 SQM which is 9.57% of its geographical area. The Reserved, Protected and Unclassified forests are 38.11%, 55.64% and 6.25% respectively of the recorded forest area. However, as the digitized boundary of recorded forest area from the state covers only an area of 23,105 SQM (State of Forest Report, 2017). The proposed project is passing through the Bandikui Protected Forest Area,

No National Park / Wildlife Sanctuary is located within 10 Km radius of the proposed alignment of the Project

### 4.4 Topography

Alwar lies at an elevation of 268 metres above mean sea level while Bharatpur, Dausa and Sawai Madhopur lie at 183, 327 and 257 metres above sea level respectively. The proposed road alignment follows flat and undulating terrain. Detailed topographic map will be provided at EIA stage.

### 4.5 Existing Infrastructure

A number of commercial and residential structures fall in the proposed stretch. The details of the structures shall be provided in the EIA report.

### 4.6 Soil Classification

Black, alluvial and brown soils are commonly found in this area. The soil is clay to sandy loam in texture. Black soil is the major variety found in the area.

### 4.7 Climatic Data

#### 4.1.1 Alwar District

The climate of Alwar is quite dry. During the summer season it is very hot, but far less than the other cities of Rajasthan. The summer season spans between the months of April and June. The Aravalli hills that enclose Alwar city protect it from the hot winds in the summers.

May is the hottest month of the year when the temperature rises up to 41°C. During this period the maximum temperature is approximately 41°C and the minimum temperature is around 28°C.



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### 4.1.2 Dausa District

The climate of the districts can be classified as semi-arid. It is characterized by very hot summers and very cold winters with fairly good rainfall during southwest monsoon period. The mean annual rainfall of the district based on 37 years data (1977-2013) works out to be 658 mm.

May and June are the hottest months, the maximum temperature may sometimes go up to 48°C.

### 4.1.3 Sawai Madhopur District

The climate of the district can be classified as semi-humid. It is characterized by very hot summers and very cold winters with fairly good rainfall during south-west monsoon period. The normal annual rainfall of the district is 721 mm is slightly higher than average rainfall. Most of the rainfall is received (93.5%) during the monsoon months.

In May, the maximum temperature may reach up to 40.6 Degree Celsius.

Sawai Madhopur, Indian Meteorological Department observatories are falling in vicinity of proposed alignment. Details of IMD observatories along with their distance in respect to proposed alignment are given in table below.

The long-term climatological data has been collected for assessment of prevailing meteorological scenario of the project region. The details of long term climatological conditions are given in table below.

**Table 4-1: Long-term (1981-2000) Climatological Conditions at IMD Observatories**

Month	Temp Monthly (°C)		Humidity (%)		Average Wind Speed (kmph)	Dominant Direction	Avg. Rainfall (mm)
	Max	Min	Morning	Evening			
IMD Observatory- Sawai Madhopur							
January	28.3	3.6	77	55	1.4	N, NE	7.2
February	32.9	5.9	66	34	1.9	N, NW	6.6
March	39.0	11.5	51	27	2.4	NW,W	4.2
April	43.6	11.5	38	22	2.9	W,NW	7.3
May	45.8	21.9	40	23	3.5	W,NW	11.8
June	45.0	21.6	54	36	4.6	W,NW	61.5
July	39.9	21.6	76	62	3.5	W,SW	236.7
August	36.2	21.1	81	68	2.6	W,SW	263.4
September	37.9	20.4	74	55	2.3	W,SW	101.5
October	37.6	13.9	62	41	1.4	W,SW	29.5
November	34.3	9.3	65	42	1.1	W,SW	11.4
December	29.1	4.8	74	47	1.3	N, NE	3.5
	46.4	3.5	63	42	2.4	W,NW	744.5

### 4.8 Available Social Infrastructure

~ 130 villages are identified along the proposed project. There are number of commercial and residential structures falling within the proposed ROW of the project. The details shall be provided in the EIA report.

## **5. PLANNING BRIEF**

The proposed project is in feasibility study stage. After having undertaken the feasibility study and the grant of Terms of Reference (ToR), Detailed Project Report (DPR) shall be completed. The DPR shall comprise of the planning brief including planning concept, land use planning, assessment of infrastructure demand and amenities/facilities.

## **6. PROPOSED INFRASTRUCTURE**

### **6.1 Industrial Area**

Not applicable

### **6.2 Residential Area**

Not applicable

### **6.3 Green Belt**

Greenbelt will be developed on both sides of the highway. Compensatory afforestation and avenue plantation will be undertaken on both sides of the highway for landscape improvement and increasing the aesthetic quality. It shall be ensured that the plant species are local, and no alien species will be introduced. Detailed plantation scheme shall be provided in EIA report.

### **6.4 Social Infrastructure**

Bus & truck lay Bye and rest areas with toilet facilities shall be developed along the proposed Project. Location of these facilities will be finalised in consultation with stakeholders.

### **6.5 Connectivity**

The proposed route is well connected with the existing road infrastructure (including nearby National and State Highways) and is accessible through SH-45, SH-14, SH-44, SH-25A, SH-25, SH-24, NH-11 and NH-11A.

### **6.6 Drinking Water Management**

No permanent installation of drinking water facilities is being planned for the project. Drinking water at a rate of 70 – 90 LPCD for labourers shall be arranged from local vendors / water tankers with prior consent. It is estimated that a total of approximately 108 KLD water will be required for consumption of construction workers.

### **6.7 Sewerage System**

Portable bio-toilets or septic tanks shall be provided for construction and operational workers. During operations phase, the waste water management system like proper sewerage system and STPs will be provided.

### **6.8 Industrial Waste Management**

Defunct machineries or parts of the mixing plants shall be stored at designated place before selling the scrap to an approved vendor.

**Pre – Feasibility Report**

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### **6.9 Solid Waste Management**

Waste management shall be done as per Solid Waste Management Rules, 2016 & and Construction and demolition waste Management Rules 2016.

In addition to the Sub-Clause 111.4 of MoRTH Specifications, The Contractor shall adopt the following Mitigation Measures.

- Control of Soil Erosion and sedimentation (Clause 306.3)
- Control of Water Pollution

The Contractor shall avoid construction works close to the streams or water bodies during monsoon. All precautionary measures shall be taken to prevent the wastewater that is generated during construction from entering into streams, water bodies or the irrigation channels. Oil interceptors shall be provided for vehicle parking, wash down and refuelling areas.

The Contractor shall adopt the following rules and regulations for effective Control of Solid and Liquid water Management

- Schedule VI - General Standards for Discharge of Environmental Pollutants, CPCB
- The Environment (Protection) Rules, 1986 and Water Act, 1974.
- Petroleum Act, 1934 and subsequent amendments
- Rules and Environment (Protection) Rules, 1986 (Standards for Emission or Discharge of Environmental Pollutants Schedule – I)
- Annexure 'A' to Clause 501 (Protection of Environment) of MoRTH Specification
- Construction and Demolition Waste Management Rule 2016
- Municipal Solid Waste Management Rule 2016

The Contractor is to ensure that there is good drainage at all construction areas, to avoid creation of stagnant water bodies especially in urban/industrial areas, including water in old types.

### **6.10 Power Requirement—Supply & Source**

Required power will be sourced through the local distribution company of Rajasthan State Electricity Board and DG sets will also be installed as power backup source.

## **7. REHABILITATION AND RESETTLEMENT PLAN**

Most of the land coming under the Project area is agricultural and built-up land. Along with this, the alignment of highway passes through forest land and barren land. The land required for the construction of highway will be acquired by NHAI before the commencement of construction work.

Land acquisition shall be undertaken as per the provision of LARR, 2013 and NHAI Act 1988 (with its amendments). Rehabilitation and resettlement plan will be prepared after detailed census survey during EIA Study and will be submitted in EIA Report.

## **8. PROJECT SCHEDULE AND COST ESTIMATES**

The Project shall start its construction work after fulfilment of the following activities:

- Finalization and approval of Detailed Project Report
- Receipt of Environmental clearance from MoEF & CC and State Government
- Selection and on-boarding of Contractor for implementation works

The completion period of the construction is estimated to be about 30 months.

The estimated cost of this section is about INR 7,900 Cr. Detailed cost break-up and Project schedule shall be discussed in the EIA report.

## **9. ANALYSIS OF PROPOSAL**

The benefits of the Project are multi-fold. It will substantially reduce the travel time between Delhi & Mumbai and the transit hubs falling on the alignment. In addition to the improved connectivity, it will also provide a boost to the economic status of the villages / towns falling in the dedicated Project area.

Overall improvement will be expected in local area in terms of:

- Better connectivity to economic, social and political hubs of the country
- Faster growth and outreach to better and improved facilities
- Fast and safe connectivity resulting in savings in fuel, travel time and total transportation cost
- Reduction in accidents
- Better approach to medical & educational services
- Faster transportation of perishable goods like fruits, vegetables, and dairy products
- Better opportunities for transporting, processing and marketing of agricultural products
- Development of local agriculture and handicrafts
- Development of tourism and pilgrimage
- Opening up of opportunities for new occupations and trade on the route
- Indirect and direct employment opportunity to people from all skilled, semi-skilled and unskilled streams
- Improved quality of life for people and so on
- Development of backward areas through rapid industrialization and access to distant markets
- Creation of ancillary ecosystem through highway amenities, support services and industrial / manufacturing areas

The project is an integral part of the Delhi - Vadodara – Mumbai Greenfield Highway Project. This will boost the socio-economical development in the entire western region of India.