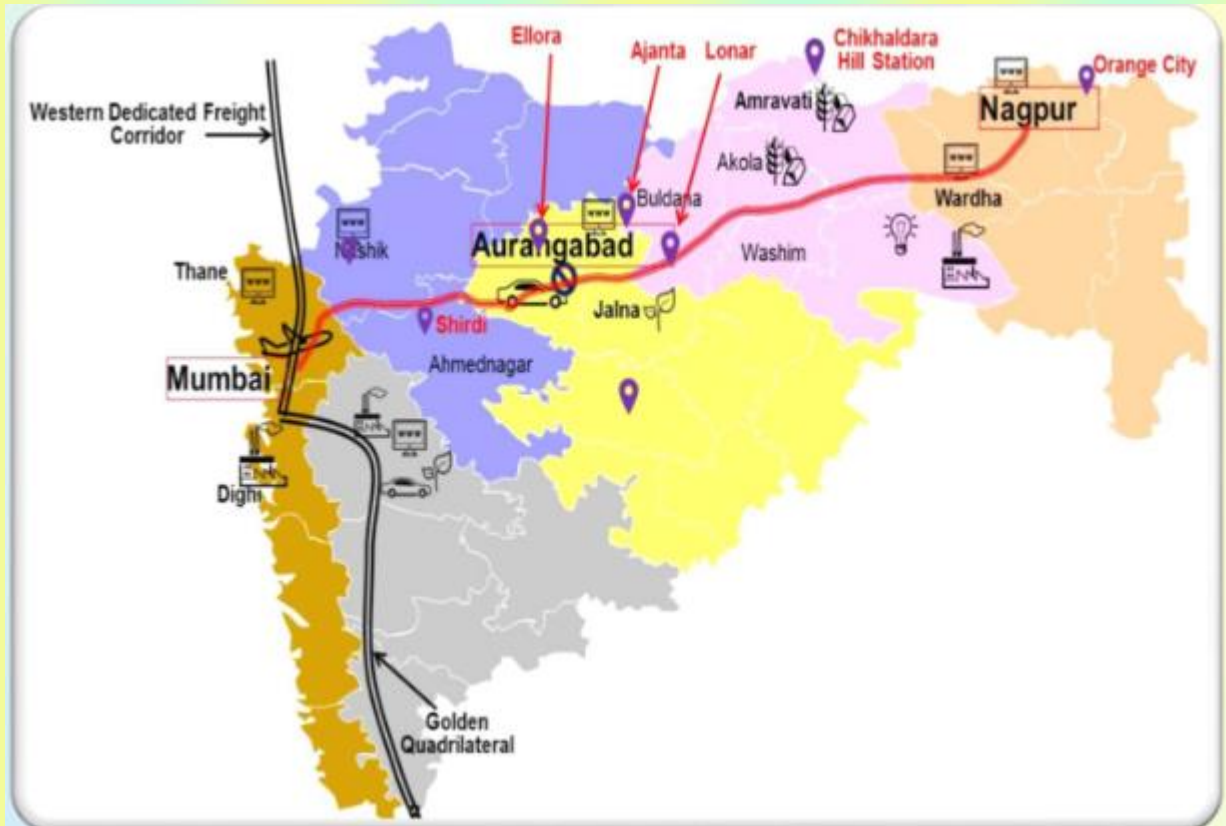


Environmental Impact Assessment Report (EIA) for Jalna to Aurangabad of 155 km length (Package III) of Access Controlled Nagpur-Mumbai Expressway



Submitted by
Maharashtra State Road Development Corporation Ltd
(Government of Maharashtra Undertaking)
Mumbai

Executive Summary

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EXECUTIVE SUMMARY

0.1 PROJECT BACKGROUND AND DESCRIPTION

The Government of India has planned 10 world class express highways in order to boost the road infrastructure for faster connectivity between different cities. Simultaneously Government of Maharashtra has planned Nagpur Mumbai Expressway (NMEW) which intends to divert and redistribute the heavy traffic on existing corridors. The proposed NMEW is being implemented by Maharashtra State Road Development Corporation (MSRDC) which will pass through 10 districts from Vidarbha through Marathwada to Konkan regions.

The major settlements which are set to be part of this plan are Nagpur District, Wardha District, Amravati District, Washim District, Buldana District, Jalna District, Aurangabad District, Ahmednagar District, Nasik District and Thane District. The NMEW will be designated as a Maharashtra State Highway (MSH) built on National Highway standards. This prosperity corridor will pass through all the five regions that make up Maharashtra Vidarbha, North Maharashtra, Marathwada, Western Maharashtra and Konkan thus linking developed and developing towns. The project ensures greater regional connectivity and equitable development as it passes through Vidarbha, North Maharashtra, Marathwada, Western Maharashtra and the Konkan region. It also promises to open new avenues of economic and social growth along the drought-hit districts of Vidarbha and Marathwada.

In this regard M/s Louis Berger has been mandated by the Maharashtra State Road Development Corporation Limited (MSRDC) for preparation of feasibility study and detailed project report for Package III. Louis Berger, a NABET Accredited Consultant for A category Projects, to carry out the Environmental Impact Assessment studies and to assist the Client in obtaining Environmental Clearance and Forest Clearance.

The NMEW will be developed as a high-density corridor establishing high-speed connectivity between Nagpur and Mumbai. As a first step in this direction the Government of Maharashtra has decided to develop and strengthen the linkages and connectivity of major cities of state with Mumbai, the state capital. Exploring the viability of one such connectivity between Nagpur and Mumbai, which includes links with and through Shivmadka – Wardha– Karanja – Aurangabad – Sinnar – Bhiwandi along with link from Karanja – Loni – Nagzari corridor. The entire length of the proposed expressway is about 701 kms and for the ease of planning, design and execution the total length of the project is divided into five packages coinciding with district boundaries as follows.

Table 0.1: NMEW Project Details

Sr. No.	Name of Project work	Approximate Length in (kms)	Estimated Civil Cost (in Rs. Crs.)	Total Cost (in Rs Crs.)	Total Project cost per km (in Rs. Crs.)
1	Package-I: Shivmadka village, Hingna Taluka,	89.355	3,348.70	5,005.66	56.02

Sr. No.	Name of Project work	Approximate Length in (kms)	Estimated Civil Cost (in Rs. Crs.)	Total Cost (in Rs Crs.)	Total Project cost per km (in Rs. Crs.)
	Nagpur District to Pimpalgaon village, Arvi Taluka, Wardha District (Border) (in Nagpur Division)				
2	Package-II: Ashta village, Dhamangaon Railway Taluka, Amaravati District (Border) to Golegaon village, Deulgaon Raja Taluka, Buldhana District (Border) (in Amravati Division).	257.881	8,235.00	13,017.03	50.48
3	Package-III: Nhava village, Jalna Taluka, Jalna District (Border) to Surala village, Vaijapur Taluka, Aurangabad District(Border) (in Aurangabad Division).	155.020	4,704.90	7,579.52	48.89
4	Package-IV: Dhotre village, Kopargaon Taluka, Ahmadnagar District (Border) to Tarangpada village, Igatpuri Taluka, Nashik District (in Nashik Division)	120.696	4,127.00	6,365.13	52.74
5	Package-V: Pimpri Sadroddin village, Igatpuri Taluka, Nashik District to Amne village, Bhiwandi Taluka, Thane District (in Konkan Division)	78.176	2,520.00	3,968.25	50.76
Total		701.128	22,935.60	35,935.60	51.25

The estimated land requirement of about 10,000 ha for developing the 701.128 km of expressway will be met through land pooling instead of traditional land acquisition method. The land pooling is a model where farmers and plot owners transfer land ownership rights to the government or the developing agency which develops the space by building roads and other infrastructure. In addition to the compensation, the land owners will also get the certain portion of their land as a developed land with the higher market values making farmers as partners in the project.

0.2 ENVIRONMENTAL ASSESSMENT OF THE PROJECT

The detailed design of the project has been closely coordinated with the preparation of this Environmental Impact Assessment Report and the Environmental Management Plans. The EIA preparation led to identification of potential negative environmental impacts and their feasible remedial measures (including avoidance, mitigation and enhancements). Based on these findings Environmental Management Plans (EMPs) have been prepared for the implementation for construction of package III. The EMPs detail the potential negative impacts and list specific mitigation measures that are required to be included and will form the part of the Contract documents between the Contractor and the Client.

Baseline Environmental Status

Baseline data has been collected including meteorological data, water quality, air quality, soil quality, noise levels, flora, fauna, land used and socio-economic status for the Project influence area during the project preparation stage, which is summarized in **Table 0.2**.

Table 0.2: Baseline Environmental Scenario in the Project Area

Environmental Parameters	Project Corridor (Package-3)
Terrain	maximum flat and small section of project road is passes through rolling terrain and hilly
Geology	Area is covered by the Deccan Trap lava flows of upper Cretaceous to lower Eocene age
Soil Type	prevailing soil type of the area is black cotton
Surface water bodies crossing/ along the project road: River/Stream/ Pond or discarded area filled with water	3nos. of river and 59 nos of local streams, 3 canals and 26 Ponds
Ground Water Bodies along the Project Road: HP/TW/Well	356 well / bore well, and Hand pump 8
Surface and ground Water Quality	Within permissible limit
Air Quality	Within permissible limit
Noise Level	Within permissible limit
Forest Along the Project Road	26.877 ha. Forest land required for Diversion.
Trees in non forest areas like agricultural land/private land	Forest Land=399 Non Forest land 4910
Forest Area in Village	8 village
Ecological-sensitive area with 10 km	No
Critically polluted area	Aurangabad -project alignment is away from about 5 km
Revenue village/ settlement area where land acquisition proposed)	86
Religious Properties along the Project Corridor (Nos)	7 Nos (6 temples, 1 Mosque)
Archaeological Properties along the Project Corridor	Bibi ka Maqbara, Daulatabad Fort and Aurangabad Caves are located vicinity of the

Environmental Parameters	Project Corridor (Package-3)
	project corridor. However, these are away from the prohibited zone about 7.00km, 1.50km and 4.30km respectively
Educational Institutes Along the Project Corridor(Nos) getting affected	Nil
Land Use Along the road	Agriculture, Built up Area, residential and river, road, railways, Forest areas
Diversion of land for proposed project	Forest land =26.877 ha Non-Forest land= 1858 ha

0.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Key Environmental Issues along the Project Road:

- Surface Water Pollution
- Impact on Religious Properties
- Felling of trees along the project road as well as in agriculture areas
- Loss of agriculture land
- Road Safety
- Impact on Air
- Impact on Noise

The assessment of impacts on various environmental components from the project roads is summarized in **Table 0.3**:

Table 0.3: Environmental Impact Summary

Sl. No.	Parameter	Details
	Negative Impacts	
1	Wells (Nos.)	356 Well
2	Diversion of Agricultural land (ha.)	1858 hectares
3	Diversion of Forest Land	26.877
4	Borrow Earth (Cum)	2.8 Cr Cub mtr
5	Quarry Material (Cum)	Stone aggregate 27 Lacs cum Sand 4 Lacs cum
6	Water (KI)	360 KLD
7	Nos of trees to be felled (Nos) in non forest + forest	Forest =399 Non Forest=4910
8	Surface water body	River=3 Pods=26 Canals= 3 Local streams =59
9	Cultural/Religious Places	7 nos.
	Positive Impacts	
1	Enhancement sites	Through compensatory afforestation in degraded forest area/ revenue area and avenue plantation along the corridor

Sl. No.	Parameter	Details
2	Median Plantation	Will be provided Shrubs/buses
3	Connectivity and road safety	Will be improved
4	Safe Assess to Educational Institute	Will be improved
5	Enhancement of Service road	Will be improved
6	Junctions/Interchange	All junction/ Interchange will be improve through provision of under passes
7	Travel time	Will be improved
8	Fuel Consumption	Will be reduced by providing smooth carriage way and it will help reducing the travel time.
Road safety Measures		
1	Interchange	Will be provided
2	Street lighting (locations)	Provided\ Improved all along the major bridges and flyovers /elevated sections
3	Signage	Improved all along the project road
4	Intersection Signs	Will be provided
5	Sign on Side roads	Will be Provided
6	School Signs	Will be Provided
7	Place identification Sign	Will be Provided
8	Traffic calming measures (locations)	Will be Provided
9	Drainage	Will be Provided
10	Crash Barriers / Guardrails	Will be Provided where as it required
11	Silence Zone Signs	Will be Provided
12	Industrial establishment Signs	Will be Provided

Mitigation measures are provided in the **Table 0.5**.

0.4 ANALYSIS OF ALTERNATIVES

Analysis for alternatives was carried out for different parameters as given below:

Table 0.4: “With” and “Without” Project Scenarios

Scenario type	Long-Term Scenario “With” Project	Long-Term Scenario “Without” Project
Environment		
Physical Environment		
Atmosphere and Climate	Travel time and traffic congestion will reduce as a result of new express highway. Overall, a lower level of air pollution. No change in climatic condition	Congested road will consume more travel time and will increase air pollution. No change in climatic condition
Topography and Soils	Significant change in topography and no impact on existing soil conditions, however better road will reduce soil erosion and dust. Landscaping along the Express highway will also enhance the esthetic beauty of the area	As it is

Scenario type	Long-Term Scenario "With" Project	Long-Term Scenario "Without" Project
Geology and Seismology	No Impact	No change and possibly some deterioration in problems due to naturally weak geological conditions.
Water Bodies and Drainage	Improved drainage due to improvement in drainage structures and facilities	No changes in present problems associated with inadequate drainage.
Ecological Environment		
Flora	About 399 trees/plants from forest area exist in proposed ROW of project corridor which are going to be affected by the proposed activity. It will change the micro level environment of the area. However, through compensatory afforestation @ 1:2 or as per the instruction of the forest department will again improve the greenery of the area but it will take some time. 26.877 ha Forest land will be diverted for purposed project.	No change in vegetation and number of trees. No change in present land use
Fauna	Increase disturbance and chances of illegal hunting during construction period which will be minimized by the patrolling of forest department proposed NMSCE construction. After construction of project side fencing/netting/ underpass will be provided which will reduce the impact on fauna.	Continued, and possibly increased disturbance to the fauna. Increased disturbance and chances of illegal hunting due to overall traffic growth on existing roads.
Agricultural Land	About 1823.1 Non forest land will be acquired for the proposed project.	No change in present land use
Social and Cultural Environment		
Social and Cultural Environment	Increased comfort and safety while traveling. Improved business environment for those living along the project road-increased passing trade from generated traffic and reduced transportation costs for imports and exports of the area. Job opportunities will be enhanced in the region and alternative livelihood options will be available.	Traveling may increase time, thereby transportation costs will increase. Reductions in comfort and safety due to congestion and deterioration in highway condition. Business opportunities remain largely the same as before.
Connectivity	Improve the connectivity between various proposed growth center	No change
Institutional Requirements		
Training of PIU	Training will need to be provided to relevant PIU officials to improve their environmental monitoring capacity during and after project construction. More staff will need to be recruited at the PIU office to enable smooth flow of all paperwork with regard to implementation of environmental policies and regulations.	No institutional strengthening is required.

Scenario type	Long-Term Scenario “With” Project	Long-Term Scenario “Without” Project
Economic Situation		
Financial Implications	Higher capital costs for using Environmental Friendly techniques for proposed expressway. Costs will also be incurred for training of PIU officials. Lower vehicle operating costs associated with smoother riding surfaces and shorter travel times.	No capital costs. However, increasing road maintenance and vehicle operating costs as road deteriorates and as travel times increase.
Induced development	Surrounding the project induced development will take place	No change
Nodes development	Nodes development will enhance the economic growth of the area	No change
Overall		
	Long term improved socio-economic and environmental conditions but an increase in expenses for project activities during the course of project construction. However, with project scenario have lots of positive impact like –reduce travel cost, reduce travel time, reduce exhaust emission by plying vehicles, enhance employment and economic growth of the area.	Small deteriorations in environmental conditions, no increase in economic opportunities and increased expenses associated with maintenance.

The project should lead to an overall improvement in environmental and social conditions through the landscaping. It is, nevertheless important to use environmentally friendly road construction techniques.

0.5 ENVIRONMENTAL MONITORING PROGRAMME

To ensure the effective implementation of the EMP, it is essential that an effective monitoring program be designed and carried out. The environmental monitoring programme provides such information based on which management decision may be taken during construction and operational phases. It provides basis for evaluating the efficiency of mitigation and enhancement measures and suggest further actions that need to be taken to achieve the desired effect.

The monitoring includes:

- Visual observations;
- Selection of environmental parameters at specific locations;

To know the effective implementation of the EMP, air, water and noise levels will be monitored during construction and operation phase of the project, details are described in **chapter 6** of EIA.

0.6 ADDITIONAL STUDIES

PUBLIC CONSULTATIONS

Discussions were held with most of the stakeholders with different type of consultations such as formal, informal and group discussions. The following issues have been discussed during public

consultation which will be suitably incorporated in EMP

- Parking facilities
- Dust suppression measures should be adopted
- Sign boards for road safety
- Provision of service road
- Employment opportunity to local people during 4-laning of project road
- Junction improvement
- Drainage management
- Suitable compensation
- Plantation of trees along the project road
- Plantation of plant in median
- Air, and Noise management during construction

CONTINUED PARTICIPATION MECHANISM

Two stages consultation was carried out in Project Corridor. In first stage consultation Information about the project was disseminated to the local people and their views/Grievances/Suggestions were solicited. These suggestions were incorporated into the design to the extent possible and Second round of consultation was carried out with a objective to inform the people about the design, suggestions which could be addressed and reasons for non incorporation of their suggestion thereof and communities were shown enhancement drawings and briefed about the enhancement measures and this process will continue through out the construction period. In the second stage each affected person/family has been consulted in each affected villages by the consultant to inform them about the project including resolving their quarries and getting their consents for the proposed project. The details of public consultation is provided in chapter 7.

0.7 PROJECT BENEFITS

Positive

Key long-term environmental and social benefits from the project will arise mainly from traditional sources, viz:

- savings in travel times – from faster vehicle speeds and reductions in congestion on existing long route and the projected overall savings in travel time and fuel consumption and it will also reduce the emission of dust;
- reduced cargo delays – from faster vehicle speeds and reductions in travel time;
- reduced vehicle operating costs – from improved riding surfaces;
- reduced road maintenance costs – from higher quality infrastructure;
- better and faster connectivity will bring the development in the region

- reduction in exhaust emission-
- reduced accidents – mainly as a result of reduced travel time and congestion but also because of the provision of safety infrastructure and warning signs, though this latter element was impossible to quantify – it was, however, estimated that the benefits from a 50% reduction in accidents; and
- A large volume of generated traffic is, however, also forecast. This is traffic stimulated by the reduction in travel costs and associated with new economic development. The benefits calculated subsume the benefits from:
 - improved access to the nearby growth centers
 - new businesses, including that from increased passing trade

Negative

The key negative, permanent and irreversible impacts will occur along the proposed alignment and will be:

- loss of forest land about 26.877 hac
- loss of 1858 hect of non-forest land
- loss of trees about 5309 (399 in forest area and 4910 in non-forest area)
- loss of agricultural land
- a marginal reduction in aesthetic beauty
- diversion of Forest and Agriculture land
- acquisition of private land
- demolition of structure falling within the proposed corridor

All the trees felled due to this project will be compensated to reduce the negative impact of the area

0.8 MITIGATION AND ENHANCEMENT MEASURES

As far as possible avoidance and reduction of adverse impacts approaches are adopted during the design stage with consideration of the design team including engineers, environmental and social experts. This is reflected in the finalization of the cross sections, construction methods, construction materials and alignment.

Compensatory and additional plantation along with landscaping will be carried to improve the aesthetic value of the areas in future. All identified impact will be either suitably mitigated or compensated, so that development will become eco-Friendly. A summary of mitigation measures proposed to mitigate the adverse impacts are presented in **Table 0.5:**

Table 0.5: Key Environmental Impacts and Management/ Mitigation Measures

Area	Impacts	Management/Mitigation Measures
Construction Phase		
Topography & geology	<ul style="list-style-type: none"> Disfiguration & change in existing profile of the land due to borrow pits & construction of new bypass. Disturbance on geological setting due to quarrying. Uncontrolled digging of borrow pits resulting in water accumulation & breeding of vector disease. 	<ul style="list-style-type: none"> Borrow pits will be restricted to 1 m depth followed by resurfacing of pits. Road building materials will be procured from approved and licensed quarries only. <ul style="list-style-type: none"> Borrow pits will be restricted to 1 m depth and we are using Larviciding agent like DDT to control larva formation resulting the control of vector disease.
Soil	<ul style="list-style-type: none"> Disruption & loss of productive top soil from agricultural fields due to borrow pits which may reduce crop yield. Loosening of top soil & loss of vegetative cover along the road due to excavation & back filling which will lead to enhanced soil erosion. 	<ul style="list-style-type: none"> Adequate measures like adequate drainage, embankment consolidation & slope stabilization will be taken along the road to avoid soil erosion. Top soils (15 cm) of borrow pit sites will be conserved and restored after excavation is over. Accidental spillage of lubricants/oil and molten asphalt will be avoided by adherence to good practices.
Land use	<ul style="list-style-type: none"> Loss of agricultural land resources due to land acquisition for the road. Generation of solid waste in the form of construction spoils from construction sites. Changes in existing land use pattern of the ROW for construction of the road. Loss of trees and diversion of forest land Generation of bituminous waste due to scarifying of damaged pavement 	<ul style="list-style-type: none"> Earth material generated from excavation of roadways & drainage will be reused during site development. Construction debris will be disposed of in suitable pre-identified dumping areas. Dumping areas will be biologically reclaimed. Construction camp will be provided to avoid indiscriminate settlement of construction workers. Compensatory and additional plantation will be carried out along the road Staging of the debris on / along the road will not be allowed. Regular inspection of construction site will be carried out to ensure for this. Scarified bitumen will be recycled for use below Sub grade under pavement or below GSB under shoulder.
Drainage	<ul style="list-style-type: none"> Change in drainage pattern of the land. Increased incidence and duration of floods due to obstruction of natural drainage courses by the road embankment. Chances of filling of existing drainage courses during earth filling. 	<ul style="list-style-type: none"> Adequate lined and covered drains will be provided for the project to facilitate its long life, and to avoid soil erosion & land degradation. Adequate cross drainage works & structures will be provided for smooth passage of runoff to avoid flooding. Steps at the bridge sites will be provided to inspect, regular cleaning and inspection of these sites. Filling of existing drainage courses will be strictly avoided.

Area	Impacts	Management/Mitigation Measures
		<ul style="list-style-type: none"> Suitable drainage at construction site & camp will be provided to avoid water stagnation, soil erosion & mosquito breeding.
Water bodies	<ul style="list-style-type: none"> Loss of water resources due to complete or partial filling up of few ponds/water bodies along the road. 	<ul style="list-style-type: none"> Filling of water bodies along the road alignment will be minimized by providing retaining walls.
Water use	<ul style="list-style-type: none"> Impact on the local water sources due to use of construction water. 	<ul style="list-style-type: none"> Minimum use of existing water sources for construction will be ensured to minimize likely impacts on other users.
Water quality	<ul style="list-style-type: none"> Increase of sediment load in the run off from construction sites and increase in turbidity in receiving streams/water bodies. Water pollution due to sewage from construction camps. 	<ul style="list-style-type: none"> Sediment traps will be provided to reduce sediment load in construction wastewater. Proper sanitation facilities will be provided in construction camp to prevent health related problems.
Air quality	<ul style="list-style-type: none"> Deterioration of air quality due to fugitive dusts emission from construction activities like excavation, backfilling & concreting, and hauling & dumping of earth materials & construction spoils, and vehicular movement along unpaved roads. Deterioration of air quality due to gaseous emissions from construction equipment & vehicular traffic. Deterioration of air quality due to emission from asphalt and hot mix plants. 	<ul style="list-style-type: none"> Construction materials will be stored in enclosed spaces to prevent fugitive emissions. Truck carrying soil, sand and stone will be duly covered to avoid spilling. Adequate dust suppression measures such as regular water sprinkling on haul & unpaved roads particularly near habitation will be undertaken to control fugitive dust. Stringent construction material handling/overhauling procedures will be followed. Low emission construction equipment & vehicles will be used. It will be ensured that all construction equipment & vehicles are in good working condition, properly tuned & maintained to keep emissions within permissible limits. Asphalt and hot mix plants will be located at least 500 m away from inhabited areas and 300 m from the road. The material will be procured from MPCBD consented stone crushers and hot mix plants.
Noise level	<ul style="list-style-type: none"> Increase in noise level due to construction activities like operation of construction equipment & vehicular traffic. 	<ul style="list-style-type: none"> Construction camp and temporary labour sheds will be located away from the immediate vicinity of the construction sites and major road traffic. Protective gears such as ear plugs etc. will be provided to construction personnel exposed to high noise levels as preventive measure. Low noise construction equipment will be used. It will be ensured that all construction equipment & vehicles are in good working condition, properly lubricated & maintained to keep noise within permissible limits. Stationary construction equipment will be placed sufficiently away from inhabited areas and silence zones. Construction activities carried out near residential area will be scheduled to the day time only so that minimum disturbances are caused to people.

Area	Impacts	Management/Mitigation Measures
Floral & fauna	<ul style="list-style-type: none"> Loss of flora & loss of habitat of avian fauna due to felling of trees along the ROW. Short term disturbance to avian fauna. 	<ul style="list-style-type: none"> No tree shall be felled beyond the toe line of proposed cross section. Median hedge will be developed to enhance the aesthetic look & reduce headlight glare on the four lane roads. Cooking fuel should be provided to construction workers to avoid cutting/felling of trees for fuel wood. 400 trees (200 each side) of the proposed corridor per kilometer will be planted along with avenue plantation on the median to avoid the reflection of light with due consultation with forest department to enhance the environment of the project area.
Amenities & cultural properties	<ul style="list-style-type: none"> Partial or total effect on roadside educational, medical & other amenities, and religious & cultural properties like temples & mosques due to additional land acquisition. 	<ul style="list-style-type: none"> Affected temples & mosques will be suitably relocated. Compensation will be given for other affected amenities like schools, colleges, hospitals, banks, post-offices & markets.
Rehabilitation & resettlement	<ul style="list-style-type: none"> Acquisition of agricultural land which is the source of sustenance of those families. Demolition of houses & other structures within ROW resulting in displacement of people. 	<ul style="list-style-type: none"> Adequate & equitable compensation, rehabilitation & resettlement measures for PAPs are provided in RAP prepared for the project.
Construction camp	<ul style="list-style-type: none"> Influx of construction work-force & supplier who are likely to construct temporary tents in the vicinity. Likely sanitation & health hazards & other impacts on the surrounding environment due to inflow of construction laborers. 	<ul style="list-style-type: none"> Temporary construction camps with adequate potable water supply, sanitation & primary health facilities and fuel for cooking will be provided to accommodate construction workers. It will be ensured that the construction workers are provided fuel for cooking to avoid cutting of trees from the adjoining areas. Domestic as well as the sanitary wastes from construction camps will be cleared regularly and disposed as per local practice stipulated by local administration. Mobile STPs will be provided at Camps.
Occupational health & safety	<ul style="list-style-type: none"> Health & safety related problems to construction workers due to inadequate health & safety measures. 	<ul style="list-style-type: none"> Adequate safety measures complying to the occupational safety manuals will be adopted to prevent accidents/hazards to the construction workers Periodic health check-up of construction workers will be done.
Road safety	<ul style="list-style-type: none"> Increase in incidence of road accidents due to disruptions caused in existing traffic movements. 	<ul style="list-style-type: none"> Proper traffic diversion and management will be ensured during construction at the interactions and construction areas. Traffic calming measures Provided.
Operation Phase		
Land use & Encroachment	<ul style="list-style-type: none"> Change of land use by squatter/ encroachment within ROW and induced development outside the ROW. 	<ul style="list-style-type: none"> Planning agencies and Collector/ Revenue Officer will be made involved for controlled development and prohibiting squatter/ encroachment within ROW.

Area	Impacts	Management/Mitigation Measures
Drainage	<ul style="list-style-type: none"> Filthy environment due to improper maintenance of drainage. 	<ul style="list-style-type: none"> Drainage system will be properly maintained.
Water quality	<ul style="list-style-type: none"> Chances of contamination of water bodies from road surface run off containing oil spills due to traffic movement & accidents. 	<ul style="list-style-type: none"> Oil interceptor will be provided at construction yard. Contingent actions will be taken for speedy cleaning up of oil spills, fuel and toxic chemicals in the event of accidents.
Air quality	<ul style="list-style-type: none"> Air pollution due to vehicular emission from road traffic. 	<ul style="list-style-type: none"> Vehicular emission will be controlled through enforcement of laws and public awareness. Truck parking lay-byes and bus bays will be provided at required locations to facilitate smooth traffic flow. Regular monitoring of air quality at specified locations will be conducted.
Noise level	<ul style="list-style-type: none"> Noise pollution due to traffic noise. 	<ul style="list-style-type: none"> Vehicular noise & use of horns will be controlled through enforcement of laws and public awareness. Road signs prohibiting the use of horns will be placed at residential areas, sensitive locations & silence zones. Regular monitoring of noise level at specified locations will be conducted by PIU.
Flora & fauna	<ul style="list-style-type: none"> Illegal felling of road side plantation. Effect on aquatic fauna in case of accidental spill of oil, fuel & toxic chemicals into water bodies. 	<ul style="list-style-type: none"> Plantation along the ROW will be maintained properly and protected from illegal felling. Contingent actions will be taken in the event accidental spill of oil, fuel & toxic chemicals.
Access	<ul style="list-style-type: none"> Significant severance problem on pedestrian & cattle crossing and cross traffic due to widening, partially access control & increase in traffic speed. 	<ul style="list-style-type: none"> Intersection & approach of existing major cross roads will be upgraded. Cattle/animal crossings to facilitate smooth traffic & pedestrian movement to avoid accidents. Access of primary schools will be modified in S shaped to slow down the speed of the primary school children, when they come out. It will avoid chances for accidents of school children. Bus bays will be provided at suggested suitable locations.
Road safety	<ul style="list-style-type: none"> Impacts on human health due to accidents. Damage of road due to wear & tear. 	<ul style="list-style-type: none"> Adequate traffic safety measures e.g. crash barriers & pedestrian railings will be provided wherever required. Proper & adequate road signs, road markings, kerb paintings and road furniture like overhead gantry signs, roadway delineators etc. will be provided. Adequate illumination will be provided at interchange locations for safe and efficient traffic operations especially during night and inclement weather. Periodical inspection of the road will be conducted to detect anomalies in pavement. Emergency telephone communication system, highway patrolling, crane and ambulance facilities will be provided.

Environmental Enhancement Measure

To improve the aesthetic beauty of the corridor enhancement measures are provided for the project like plantation of trees along the project road, plantation of bushes and flowers in median, provision of dust sprinkling during consecution etc.

Environmental Budget

An Estimate of the cost component involved in mitigation of impacts, enhancements (through landscaping or specific enhancement measures for cultural properties and typical enhancements such as ponds) monitoring and evaluation of various components in pre-construction, construction and operation period has been estimated. The summary of Environment Budget is as follows in **Table 0.6**.

Table 0.6: Summary of Environment Budget*

Items	Cost (Rs.)
Mitigation	163025000
Monitoring	24912000
Training and other	500000
Total	188437000
Contingency	9421850
Total	197858850

➤ The Cost details has been provided in table 9.1 of the EIA report (chapter-9)

0.9 INSTITUTIONAL ARRANGEMENTS

The Maharashtra State road Development Corporation (MSRDC), a nodal agency for development of infrastructure projects in the in the State. On behalf of Government of Maharashtra, MSRDC is entrusted to develop Nagpur-Mumbai Super Expressway.

The Chief Engineer, MSRDC will responsible for the successful implementation of the Project. Executive Engineers and his supporting staff as Employers representatives nominated for the project are responsible for the implementation of the Projects under his division.

0.10 CONCLUSIONS

The key positive Impacts are:

- savings in travel time – from faster vehicle speeds and reductions in travel time;
- reduced cargo delays – also from faster vehicle speeds and reductions in travel time;
- reduced vehicle operating costs and passenger comfort– from improved riding surfaces;
- reduced maintenance costs – from higher quality infrastructure;
- reduced accidents – mainly as a result of reduced travel time and use of signage

- A large volume of generated traffic is forecasted. This will be traffic stimulated by the reduction in travel costs and associated with new economic development and deriving, amongst other things, from:
- New businesses, including those from increased passing trade.

In addition to the above, there should be:

- an overall reduction in problems from exhaust emission improved drainage; and

A wide range of short-term negative impacts are, however, envisaged during construction - these include: disturbance to wildlife and settlements; localised dust pollution; increased sediments in water bodies; small-scale erosion; and health hazards amongst construction workers and those residing in nearby settlements. However, most of these can be adequately mitigated through: practicing Environmental Friendly Road Construction techniques; proper location of construction camps; and equipping construction sites with adequate medical facilities.

The major long-term negative impact will be the permanent loss of about 26.877 ha Forest, 1858 ha of non-forest land and felling 5309 trees exist on these land. This can, however, be mitigated by plantation under compensatory afforestation. There may also be some small-scale temporary impacts on wildlife habitats. However, investigations show that this is not a significant issue for important protected species. Removal of only necessary vegetation during construction, and thereafter the maintenance of forest cover on both sides of the project road, will help minimise long-term negative impacts.