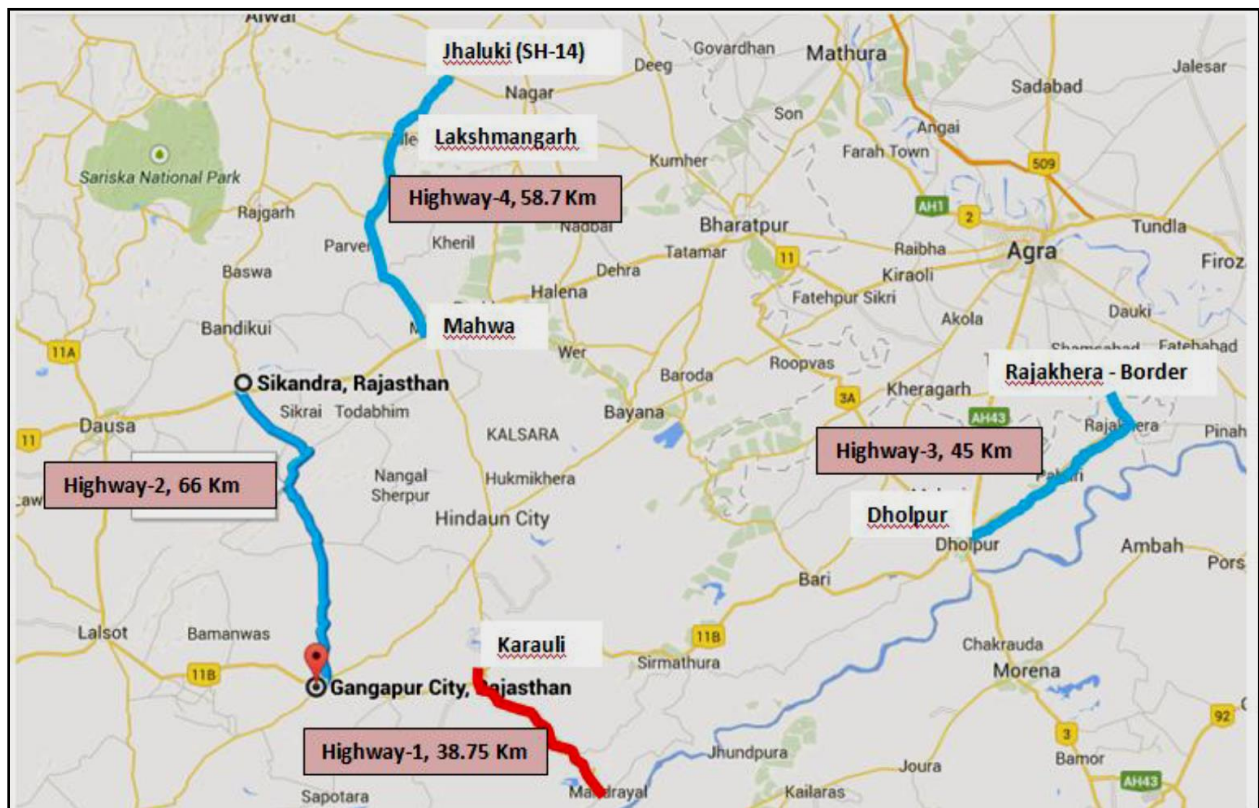




Development of Karauli-Mandrayal SH-22 Road, From km 0.000 to km 38.750, in the state of Rajasthan (the “Highway-1”) Package 13

PRE-FEASIBILITY REPORT

JUNE-2016



EXECUTIVE SUMMARY

This Prefeasibility Report (PFR) is submitted in accordance with the requirements of ToR of MoEFCC for the subsequent project of “ **Consultancy Services for Preparation of Feasibility Report of Two-Laning of km 0.000 to km 38.750 of SH-22 comprising the section from Mandrayal to Karauli** (the “Highway I”) Package – 13 initiated by Rajasthan PWD, PPP division.

Govt. of Rajasthan has announced development of 20,000 km highways during next 5 years. Projects and schemes are being identified for implementation. This is the 7th (KD7) of 9 required deliverables, earlier 6 reports – Inception Report, Supplementary Inception Report, Report on Alignment and First Traffic Survey, Report on Land Plan Schedule and Utility Relocation, Report on Indicative GAD of Structures and Report on Environment and Social Impact Assessment have been submitted.

The project road starts at km 0.000 near Agarwal Dharmshala (Mandrayal) and ends at km 38.750 at NH-11B junction in Karauli. The design length is 38.750 km.

The project road is passing through Karauli district, and two Tehsils Mandrayal and Karauli, and 6 villages. All villages are come under semi arid climatic conditions with hilly region.

Appreciation of traffic and road geometry, and road condition is the first step in Technical Feasibility Study. Extensive surveys of classified traffic volume count (2 stations), road inventory & road condition survey, alignment survey, pavement investigations, Benkelman Beam Deflects, surface pavement conditions, axle load survey and inventory of culverts & bridges have been carried out.

There are two locations where traffic survey is held first at km 4.000 and other is km 29.000. The Total PCUs varies from 1063 to 2801.

The ADT so obtained at all the traffic survey locations are projected at a uniform growth rate of 5% for all categories of vehicles as mentioned in the TOR. The year in which the project road reaches its design service volume at LOS-B is worked out for 2-lane and 2-lane with paved shoulder configuration.

The terrain along the highway is plain, rolling and hilly. There is ribbon development with a mix of commercial/residential and industrial activities.

The type of shoulders is earthen and width varies from 0.5m to 2.0m on either side. The condition of the shoulder varies from fair to very poor, with edge drops and rain cuts.

The development along the road has been uncontrolled. Therefore, at certain locations

encroachment within ROW has been observed in the form of shops, Dhabas and various other commercial establishments.

At certain locations Low-tension overhead electrical lines are running along the highway and cross the highway. While widening the road, the utility lines located on the new carriageway or widening portion would need shifting. There is a need for relocation of 81 electric poles, transformers 10, and 10 hand pumps. Around 390 trees are to be removed.

Entire length of SH-22 has bituminous surface except (built up sections with cc pavement) 36% of project road length is in good condition, 30% in fair condition and 34% in poor condition.

The existing pavement consists of bituminous layers, WBM and granular sub-base. A broad variation in pavement thickness along the project road was observed. The bituminous part varies from 25mm to 150mm. While non-bituminous depth varies from 80mm to 220mm. Pavement Deflection and sub grade strength: The BBD values vary between 0.57 mm to 0.77mm along the project road.

Base and sub base layers have been designed for 15 years and surface layers have been designed for 8 years (including construction period of 30 months)

There are one minor bridge and 43 culverts consisting of 22 hume culverts, 3 RC slab culverts, 8 stone culverts and 10 causeway. There are no railway level crossings; RUB, ROB and no railway level crossing were observed.

01 toll plazas are proposed along the entire project road. In order to provide rest and amenities for travelling public, the locations is at km 31.000 are identified. The private entrepreneurs will be called to develop restaurants, workshops, toilet facilities, shops, first aid etc. Avenue plantation and development of certain sites as recreational areas will be envisaged in-consultation with the client.

The estimated total construction cost of the Project is **Rs. 40.04 Crores** Concession period is 25 years. Total Project Cost (including financing cost on Debt & IDC) is **Rs. 64.04 Crores**, Project IRR 13.23 % and Equity IRR is 15 %. Average Debt service coverage ratio (DSCR) is 1.14.

CHAPTER 1

PROJECT INTRODUCTION

1.1 INTRODUCTION

The Governor of Rajasthan acting through the Chief Engineer (Roads), Public Works Department, Government of Rajasthan (the “Authority”) is engaged in the development of state highways and as part of this endeavor, the Authority has decided to **undertake two-laning of Mandrayal-Karauli** (the “Project”) through Public Private Partnership (the “PPP”) on ANNITY basis.

Authority has decided to conduct feasibility studies for determining the technical feasibility and financial viability of all Highways comprising the Project. The project If found technically feasible and financially viable, may be awarded on ANNITY basis to a private entity (the “Concessionaire”) selected through a competitive bidding process. The Project would be implemented in accordance with the terms and conditions stated in the concession agreement to be entered into between the Authority and the Concessionaire (the “Concession Agreement”)

In pursuance of the above, the Authority has decided to carry out the process for selection of a Technical Consultant, a Financial Consultant and a Legal Adviser for preparing the Feasibility Report and bid documents. The Financial Consultant will develop the revenue model and assist the Authority in the bidding process. The Legal Adviser will review the draft concession agreement based on the Model Concession Agreement for State Highways through Public Private Partnership (the “MCA”) read with the Manual of Standards and Specifications. The Technical Consultant shall prepare the Feasibility Report in accordance with the Terms of Reference specified (“TOR”). This is the 8th (KD8) of 9 required deliverables, earlier 7 reports :- (i) Inception Report, (ii) Supplementary Inception Report, (iii) Report on Alignment and First Traffic Survey, (iv) Report on Land Plan Schedule and Utility Relocation, (v) Report on Indicative GAD of Structures, (vi) Report on Environment and Social Impact Assessment and (vii) Draft Feasibility Report have been submitted. This Final Feasibility Report is presented.

1.2 OBJECTIVES

The main objective of the consultancy services is to establish the technical feasibility and financial viability of the selected project road.

To prepare separate Feasibility Reports for all highways comprising the project for the purpose of firming up the Authority’s requirements in respect of development and construction of the project, Project Facilities and enabling the prospective bidders to

assess the Authority's requirements in a clear and predictable manner with a view to ensuring:

- I. Enhanced safety and level of service for the road users.
- II. Superior operation and maintenance enabling enhanced operational efficiency of the Project;
- III. Minimal adverse impact on the local population and road users due to road construction.
- IV. Minimal adverse impact on environment.
- V. Minimal additional acquisition of land.
- VI. Phased development of the project for improving its financial viability consistent with the need to minimize frequent inconvenience to traffic that may be caused if additional works are undertaken within a period of seven years from the commencement of construction of the Project.

1.3 STRUCTURE OF PRE FEASIBILITY REPORT

- 1: Executive Summary
- 2: Project Introduction
- 3: Project Description.
- 4: Site Analysis
- 5: Planning Brief
- 6: R&R Plan
- 7: Project Cost and Cost Estimate
- 8: Analysis of Proposal (Final Recommendations)

CHAPTER 2

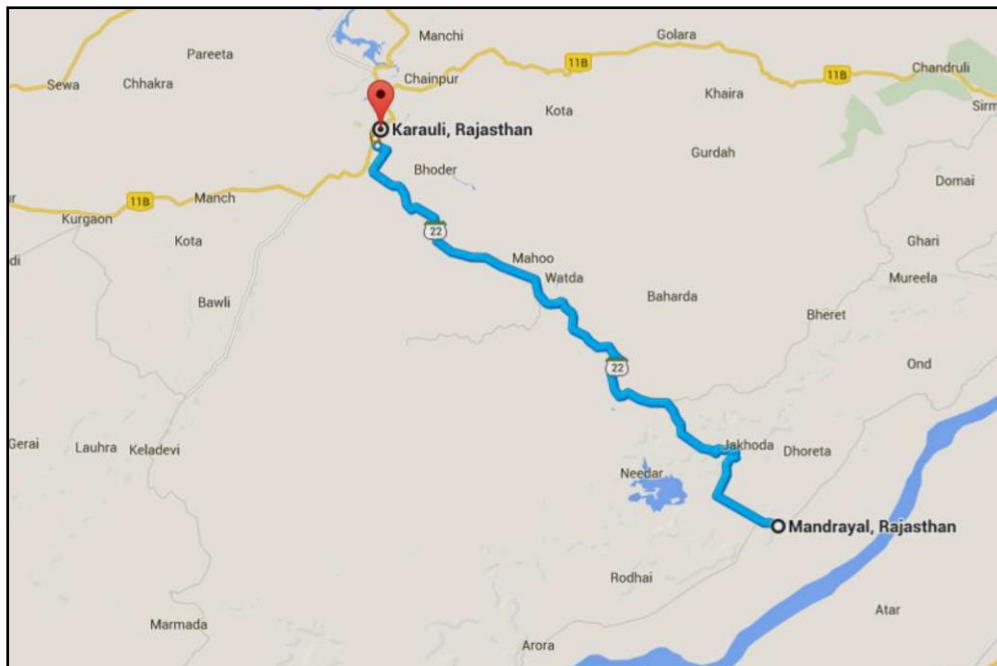
PROJECT DESCRIPTION

Rajasthan is located in the north western part of the Bhartiya subcontinent. It is bounded on the west **and northwest by Pakistan, on the north and northeast by the states of Punjab, Haryana, and** Uttar Pradesh, on the east and southeast by the states of Uttar Pradesh and Madhya Pradesh, and on the southwest by the state of Gujarat. The state has an area of 132,140 square miles (342,239 square kilometers). The Project road lies in the North-East to North-West part of Rajasthan state.

The project road starts from Mandrayal and ends at NH-11B junction in Karauli. The design length is 38.75 km.

Keladevi and National Chambal wildlife sanctuary this project road falls under Category A of MOEFCC as written in EIA guidelines and Wildlife Protection Act 1972 is also applicable for this project, so prior environment clearance from MoEF and wildlife clearance from national board of wildlife is necessary.

The original project highway alignment which is started as Mandrayal-Karauli (as per Contract Agreement) under gone many changes in its route course due to the clients decision during several site visits and discussions with the Advisor to Government, Infrastructure development and other higher officials. The route course was to include the existing SH-22 stretch from Mandrayal-Karauli. The section from Mandrayal to Karauli via Langra, Gadi, sankra and Bichpuri is notified as SH-22A. (vide Location Map).



❖ **Figure 1.1 Location Map of Project Road**

The project corridor has a Single/intermediate/two lane carriageway at various sections. In general the terrain is plain. In some built-up sections, higher road width was observed. The land use pattern is mainly agricultural and remaining is commercial and residential. Existing earthen shoulder width varies from 0.5m to 2.0m.

The existing single/intermediate/two-lane carriageway alignment has a number of sharp horizontal and vertical curves which require geometric improvement and the existing gradient of the highway is within acceptable limits as per IRC: 73 in the stretch of the highway where it passes through plain terrain.

CHAPTER: 3

SITE ANALYSIS

3.1 Land Form, land Use and Topography

The project influence area Land form and topography are provided in the **Figure 3.1**. Most of the area is plane with sand domes and dry climatic conditions.

3.2 Analysis of Alternatives

regards to socio-economic and environmental consequences to each alternative and the cost attributed to it. The option study will also enable the consultants to approach people for various aspirations of the local stakeholders.

3.3 Environmental Alternatives and Design Considerations

The project offers some environmental alternatives in order to facilitate the decision making process. As usual the analysis of alternative should start with the customary ‘with’ and ‘without’ the project scenario. This is to justify the proposal of a widening alternative to no widening alternative. The “*with*” project scenarios will, however occur, only if the recommendations provided for the construction stage are followed and all construction activities are carried out according to principles of Environment Friendly Road Construction.

The alignment from Mandrayal to Karauli (39 km) via Langra and Harnagar.

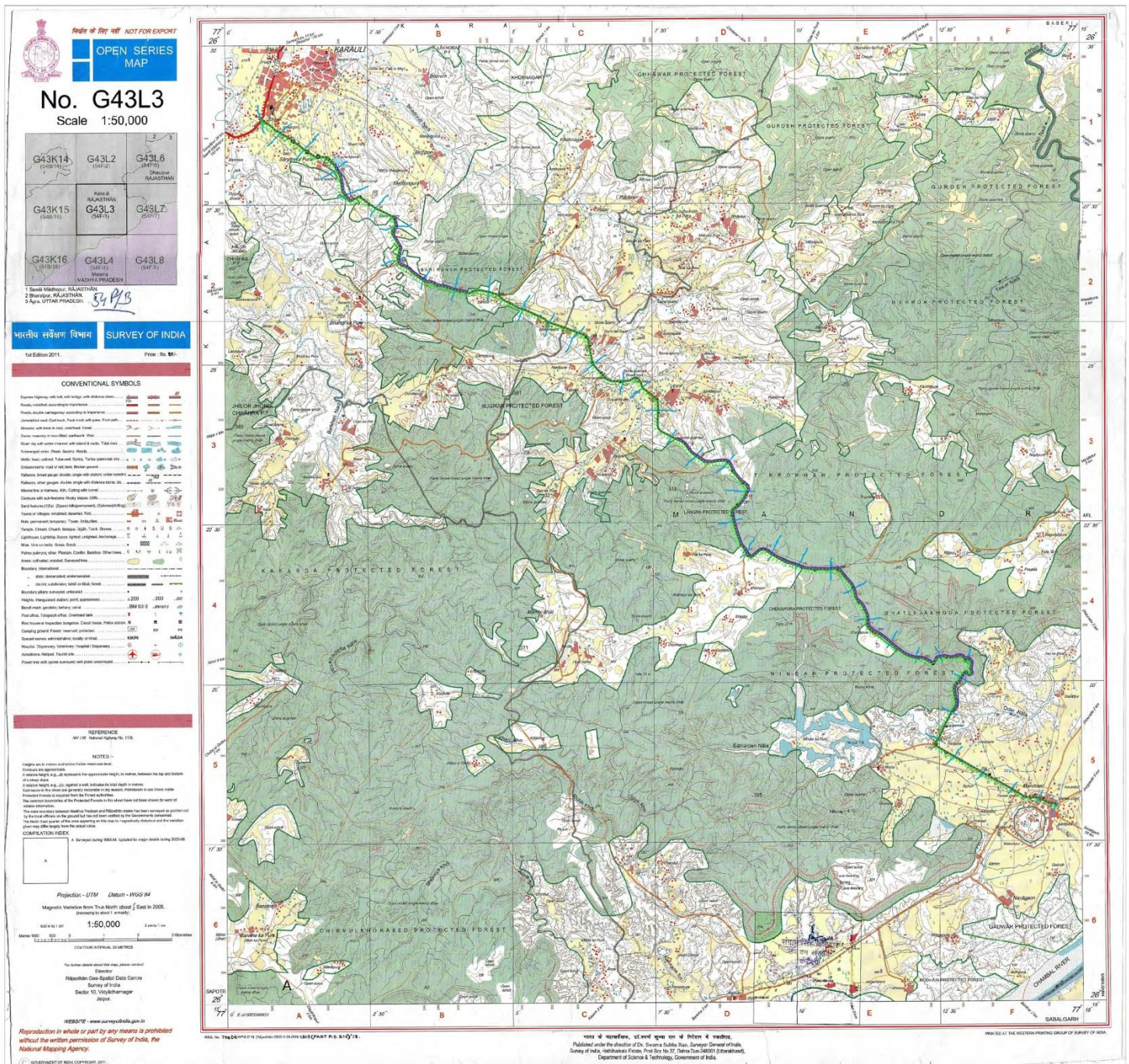


Figure 3.1: Topographical Map of Site

For working out the proper feasibility of the project and alignment options, the site of complete road was inspected by the entire team ACE PPP, SE PPP and PD PPP on 17-10-2014 and it was decided that entire road taken up with a construction period of 24 months. We started preparation of project accordingly.

3.4 Proposed Bypasses/Realignment

The existing road passing through Mandrayal, Langra, Gadi, Sankra Bichpuri, and Karauli built-up sections. There is no bypass along the project road. the details are presented in *Table 3.1*.

Table 3.1: Proposed New Sections and Bypasses

Section	Length	Remarks
-Nil-		

3.5 EXISTING LAND USE PATTERN

land use use patten in the project influence area is given in the Figure 3.2. Predoninnet land use in this area is open barren land with sandy soil.

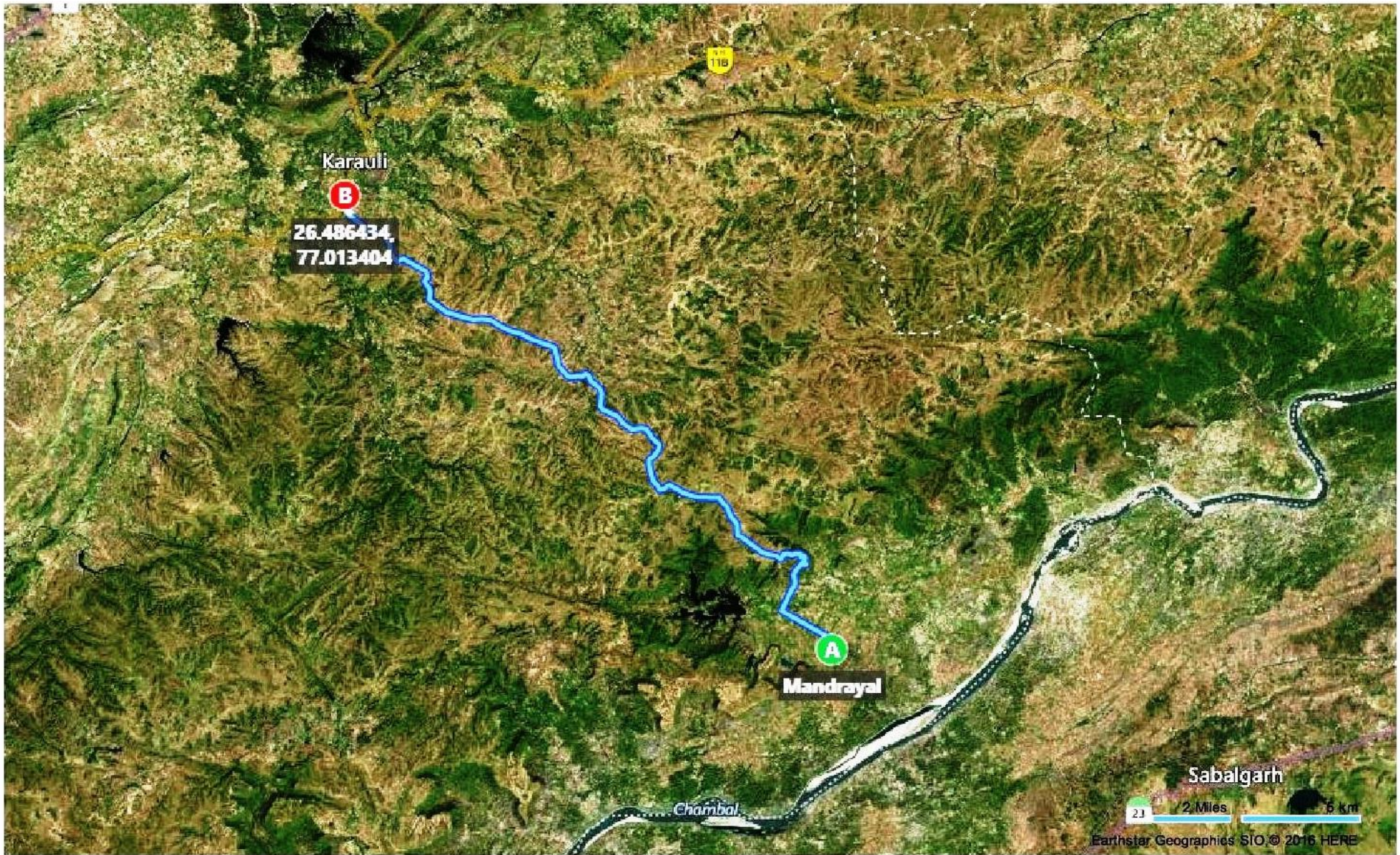


Figure 3.2: Land Use along the Existing Road and Proposed land Use-

3.6 SOIL

The nature of the soil is generally alluvial in nature which prone to water logging. Karauli soil is classified as saline and sodic. The nutrient status of the Karauli soil is graded as medium nitrogen, medium phosphorus, and high potassium levels. Karauli is essentially a hilly area surrounded on three sides on plans and one side by the Chambal River. The Mountain Aravali's eastern series consists of quartz, Mica, gneiss and Migmatites etc., whereas, the rock of Great Vindhyan series, mainly in Kaimul, Riwa and Bhandar, consists largely of sand stone, lime stone and slate.

3.7 Climate

The Rajasthan state falls under the Sub-tropical arid (desert) climate. Rajasthan is one of the hottest states of India. In Rajasthan, climatic conditions vary throughout the year. Rajasthan weather is usually hot and dry, yet one can see four distinct seasons in this state. These can be classified as summers, Monsoons, autumn (Post-monsoon) and winters. Winter commences from late November to end of February and characterized by heavy dew, thick fog and associated cold wave. Summer extends from March to middle of June The rainy season commences from the last week of June and continues till the end of September. Karauli district is characterized by sub-tropical dry climate with distinct cold (November-February), hot (March-June) and rainy (July-September) seasons. October is a transition period.

Chapter 4

Planning Brief

4.1 4.1 GENERAL

The Improvement proposals for the proposed up-gradation to 2-Lane with earthen shoulder configuration system includes the provision for the following major items:

- Geometric Improvements and realignments
- Pavement – strengthening and reconstruction
- Bridges and Cross-Drainage Structures
- Safety and
- Road Appurtenances

4.2 GEOMETRIC DESIGN PROPOSALS

The proposal for the improvement of the geometric elements of the existing highway includes:-

- Improvement to cross-sectional elements
- Alignment Design

4.2.1 Improvement to Cross-Sectional Elements

Proposed Cross Sectional Elements

Lane Width

The lane width is proposed to be 3.5m and the carriageway width 7.0m with 1.5 m Shoulder on either side.

Utility Corridor

All utilities to be provided in the outermost 2m width of ROW edge on either side

Side Slopes

For fill sections, the following side slopes are proposed:

Embankment height up to 3.0m - 2H:1V and Considering the Embankment Material property Embankment height from 3.0m to 6.0m

Embankment height from 3.0m to 6.0m- 2.5H:1V and Considering the Embankment Material property

- Embankment height exceeding 6.0m - To be designed as per material property and as per IRC:75
- Cutting Sections - 1H: 1V and with considering the material Property of the cutting material

Cross-fall

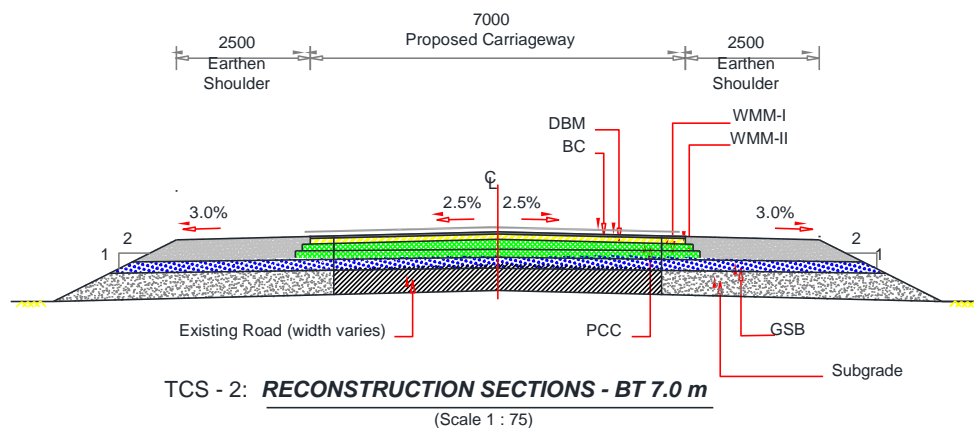
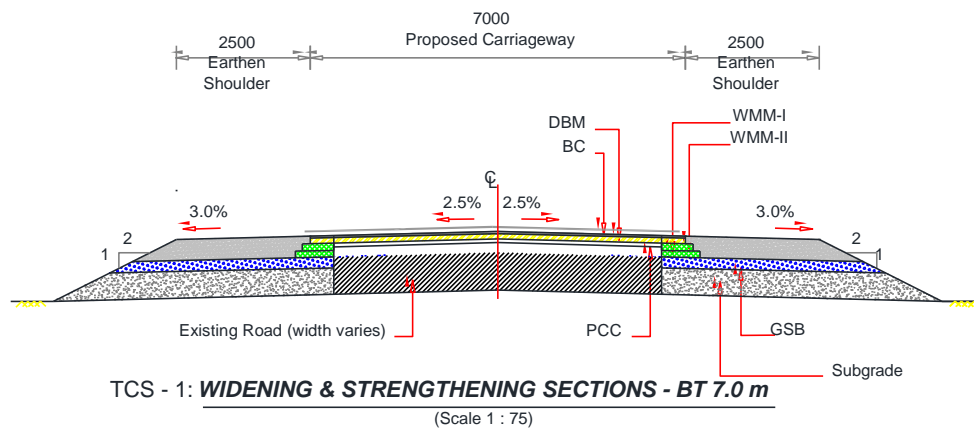
For Two laning the cross-fall for the pavement will be 2.5% with a crown in the centre and for gravel shoulders will be 3.0%.

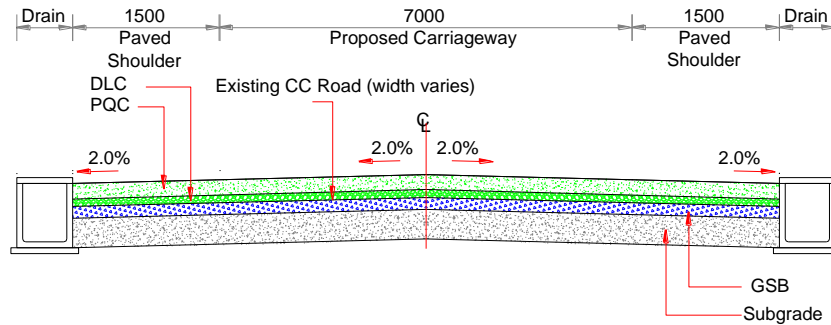
For Four laning the cross-fall for the pavement will be 2.5% on either side of divided carriageway and for gravel shoulders will be 3.0%.

Right of Way (ROW)

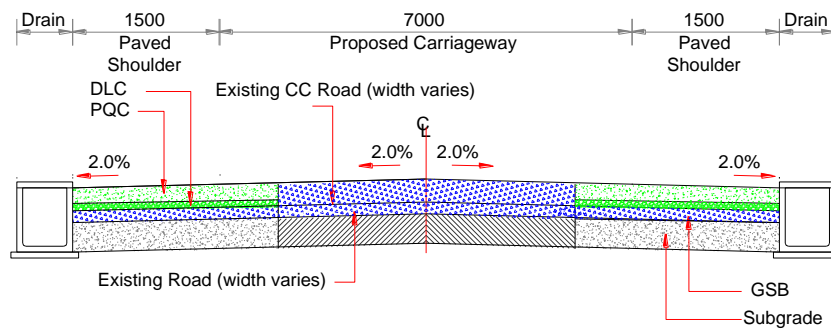
Typical Cross Section

The typical cross sections to be followed in the project stretch are detailed in (Drawings)





TCS - 3: **CC PAVEMENT NEW IN BUILT UP SECTIONS**
(Scale 1 : 75)



TCS - 4: **CC PAVEMENT WIDENING IN BUILT UP SECTIONS**
(Scale 1 : 75)

Typical Cross Sections

4.2.2 Widening Scheme

The existing project roads have multidimensional facets in terms of geometry, pavement condition, existing utilities, religious structures, etc. Considering all these aspects the section-wise policy is adopted for widening Two Lane with Paved Shoulders standard from Mandrayal to Karauli. The widening scheme can generally be summarized as concentric widening except at a few locations like major bridge, populated urban area etc.

The scheme conforms to general policy decision and is finally designed on the precise geometric configuration, realignment, re-sectioning, environmental consideration and availability of exact land widths etc..

4.2.3 Truck Lay byes

Truck Lay byes is not proposed.

4.2.4 Road Markings

The location and type of marking lines, material and color is followed using IRC: 35-1997 – “Code of Practice for Road Markings.”

The road markings were carefully planned on carriageways, intersections and bridge locations.

4.2.5 Cautionary, Mandatory and Informatory Signs

Cautionary, Mandatory and Informatory Signs have been provided depending on the situation and function they perform in accordance with the IRC: 67-2001 guidelines for Road Signs.

4.2.6 Kilometer Stone Details

The details of kilometer stones are in accordance with IRC: 8-1980 guidelines, Kilometer stones are located on the left-hand side of the road as one proceeds from the station from which the Kilometer count starts. On divided roads with a central median, kilometer stones would be provided at the left on both sides of the road i.e independently for each direction of travel. Kilometer stones shall be fixed at right angles to the centre line of the carriageway.

4.2.7 200m Stones and Boundary Stones

The details of 200m stones and boundary stones conform to IRC: 26-1967 and IRC: 25-1967. 200m stones are located on the same side of the road as the kilometer stones. The inscription on the stones shall be the numerals 2, 4, 6 and 8 marked in an ascending order in the direction of increasing chain age away from the starting station. The numerals shall be black on a white background. Boundary stones shall be located on either side of the road opposite every 200m stone and kilometer stone. In addition these shall be fixed at all angular points of the boundary. Where the boundary is on a curve or the land is of significant value and likely to be encroached upon, the boundary stones, as required, shall be installed at closer intervals.

4.2.8 Delineators and Object Markers

Roadway delineators are intended to mark the edges of the roadway so as to guide drivers on the alignment ahead. Object markers are used to indicate hazards and obstructions within the vehicle flow path, for example, channeling islands close to the intersections.

Delineators and object markers are provided as per the details given in the drawings and are provided in accordance with the provisions of IRC: 79-1981. They are basically driving aids and should not be regarded as substitutes for warning signs, road markings or barriers. Delineators are provided for all curves of radius less than 600m. They are not provided at locations where Chevron sign boards are provided.

4.2.9 Retaining Walls

Certain stretch of the project highway requires retaining walls in order to confine & retain the embankment slopes.

4.2.10 DESIGN OF TOLL PLAZA

Toll plaza location is one of the most important aspects of any toll scheme. The key factors that govern the optimum location of toll plaza are:

- Minimum traffic diversion from project road to surrounding road network
- Revenue collection
- Local issues and local toll able traffic
- Compatibility with National Highways Act
- Engineering issues

4.2.11 Toll Plaza Locations

Location of toll plazas has been proposed based on the traffic dispersal pattern at the respective homogenous sections, road geometry and vertical profile of the road and the surrounding area.

Also while fixing the toll plazas for this project, the proposed Toll Plaza locations for the preceding and succeeding packages were considered.

The location of the toll plazas is based on the following:

- Distance between the toll plazas
- Distance from nearest major settlements and municipal limits
- Maximum capture of tollable traffic to increase financial viability
- Avoidance of bridges and culverts
- Avoidance of junctions

- Avoidance of sharp curves

4.2.12 Toll Plaza Design

A width of 3.2m between two up-standing kerbs of tollbooth islands is considered optimum in order to channel vehicles and to ensure they stop close enough to the toll collector.

One extra lane 4.5m width should be provided in each direction, in addition to toll lanes, for Non-Toll-able/exempt vehicles and oversized (extra wide) vehicles, which cannot pass through regular toll lanes.

Number of Toll Lanes

The minimum toll lanes required with semi-automatic toll system for the projected peak hour traffic is considered as per manual, with a provision of adding toll lanes as per future requirements.

Chapter 5

Rehabilitation and Resettlement (R&R) Plan

5.1 INTRODUCTION

This chapter of the report discusses about the existing laws and regulations of the country and those applicable to the proposed project. It is imperative to analyze the Acts and bylaws to understand the legalities and procedures in implementing project and identifying the gaps and area where there is a need for strengthening on resettlement and rehabilitation of project affected persons and indigenous population development plan.

The Government of India has brought in to force a new Act viz., the "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013" (RFCTLARRA) with effect from 1-1-2014. Section 103 of the said Act provides that it shall be in addition to and not in derogation of any other law for time being in force and that Section 107 provides that the Act shall not prevent any State from enacting any law to enhance or add to the entitlements enumerated under the said Act which confers higher compensation than payable: and made provisions for R&R which is more beneficial than benefits under the RFCTLARRA Act-2013.

5.2 RIGHT TO TRANSPARENCY AND FAIR COMPENSATION IN LAND ACQUISITION AND RESETTLEMENT AND REHABILITATION ACT, 2013 AND RTFCLARR ORDINANCE, 2014

RFCT in LARR, 2013 is a first national/central law that addresses landacquisition and rehabilitation and resettlement

This new Act provides an enhanced framework for providing compensation and resettlement and rehabilitation assistances through a participative and transparent process for land acquisition in the public interest. The Right to Transparency and Fair Compensation in Land Acquisition and Resettlement and Rehabilitation Act, 2013 (RFCTLARRA) is adopted and it is applicable to all states in India (Except the state of Jammu and Kashmir). It is drawn on similar lines as adopted by Rajasthan state for this project, by suitably amending the Policy Framework and Entitlement Matrix, ensuring

that the compensation and R&R assistance are equal or higher than the quantum prescribed in the RFCTLARRA Act, 2013.

The Act lays down procedures for estimating fair compensation of the affected families (and not just the titleholders) due to land acquisition, rehabilitation and resettlement. Some of the key features include the following: (i) Preliminary Investigations /Preparation of Social Impact Assessment (SIA) and prepare Social Impact Management Plan (SIMP). (ii) Preliminary Notification stating : project/public purpose; reasons necessitating land acquisition; summary of SIA; and particulars of the Administrator appointed for the purpose of rehabilitation and resettlement; receipt of Objections and Hearing after the approval of SIA and within 12 months from the date of SIA approval; (iii) Preparation of Rehabilitation and Resettlement Scheme and its Declaration by the District Collector or after the same is approved by the Commissioner- Rehabilitation and Resettlement. (iv) Public Notice and Award of compensation and R&R assistances by DC within a period of twelve months from the date of the Award publication.

The objectives of Act are as follows:

- To minimize displacement and to promote, as far as possible, non-displacing or least- displacing alternatives;
- To ensure adequate rehabilitation package and expeditious implementation of the rehabilitation process with the active participation of the affected families;
- To ensure that special care is taken especially for protecting the rights of the members of the Scheduled Castes and Scheduled Tribes, and to create obligations on the State for their treatment with concern and sensitivity;
- To provide a better standard of living, making concerted efforts for providing sustainable income to the affected families;
- To integrate rehabilitation concerns into the development planning and implementation process; and
- Where displacement is on account of land acquisition, to facilitate harmonious relationship between the requiring body and affected families through mutual cooperation.

Salient features of the RFCTLARRA, Act, 2013 are listed below:

1. The Act provides for land acquisition as well as rehabilitation and resettlement. It replaces the Land Acquisition Act, 1894 and National Rehabilitation and Resettlement Policy, 2007.
2. The act provides for the baseline for compensation and has devised a sliding scale which allows States to fix the multiplier (which will determine the final award) depending on distance from urban centers;
3. Under the new Act, Social Impact Assessment is a key requirement; the Social Impact Assessment report shall be examined by an independent multi-disciplinary expert group, which will also include social science and rehabilitation experts;
4. The affected communities shall be duly informed and consulted at each stage, including public hearings in the affected areas for social impact assessment, wide dissemination of the details of the survey to be conducted for R&R plan or scheme.
5. Compensation in rural areas would be calculated by multiplying market value by up to two and adding assets attached to the land or building and adding a solatium. In urban areas it would be market value plus assets attached to the land and solatium;
6. The Collector shall take possession of land only after ensuring that full payment of compensation as well as rehabilitation and resettlement entitlements are paid or tendered to the entitled persons; families will not be displaced from land till their alternative R&R sites are ready for occupation;
7. The benefits to be offered to the affected families include; land-for-land, to the extent Government land would be available in the resettlement areas; preference for employment in the project to at least one person from each nuclear family subject to the availability of vacancies and suitability of the affected person; training and capacity building for taking up suitable jobs and for self-employment;; preference to groups of cooperatives of the affected persons in the allotment of other economic opportunities in or around the project site; wage employment to the willing affected persons in the construction work in the project; housing benefits including houses to the landless affected families in both rural and urban areas; and other benefits;
8. Financial support to the affected families for construction of cattle sheds, shops, and working sheds; transportation costs, temporary and transitional accommodation, and

comprehensive infrastructural facilities and amenities in the resettlement area including education, health care, drinking water, roads, electricity, sanitation, religious activities, cattle grazing, and community resources, etc.;

9. Special provision for the STs and SCs include preference in land-for-land; a Tribal Development Plan (TDP) for settling land rights due, restoring titles of the Scheduled Tribes as well as the Scheduled Castes on the alienated land; community consultations; upfront payment of one-third of the compensation amount the affected families initially as first installment; payment of additional twenty-five percent if relocated outside district. Rehabilitation and resettlement benefits to which they are entitled in monetary terms along with a one-time entitlement of fifty thousand rupees;
10. For ensuring transparency, provision has been made for mandatory dissemination of information on displacement, rehabilitation and resettlement, with names of the affected persons and details of the rehabilitation packages. Such information shall be placed in the public domain on the Internet as well as shared with the concerned Gram Sabhas and Panchayats, etc. by the project authorities;
11. No income tax shall be levied and no stamp duty shall be charged on any amount that accrues to an individual as a result of the provisions of the new law;
12. The final award has to include damage to any standing crops and trees which might have been harmed due to the process of acquisition (including the preliminary inspection).

A. ENTITLE ASSISTANCE & BENEFITS

Based on the above analysis of government provisions the broad resettlement principle for this project shall be the following:

- The involuntary resettlement and adverse impacts on persons affected by the project would be avoided or minimized as much as possible exploring viable alternative project design;
- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits;

- Efforts should be made to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher;
- Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs;
- Replacement land shall be an option for compensation in the case of loss of land. In case of unavailability of replacement land, cash-for-land with compensation on replacement cost option will be made available to the PAPs;
- Compensation for loss of land, structures and other assets will be based on full replacement cost and will be paid before physical displacement of PAPs including transaction costs;
- In the event of necessary relocation, PAPs shall be assisted to integrate into host communities;
- All land acquisition for the project would be done as per RFCTLARRA, Act, 2013. Additional assistance would be provided to the PAPs for meeting the replacement cost of the property;
- Compensation and all R&R assistance shall be disbursed except skill enhancement entitlements before initiating civil works;
- The uneconomic residual land remaining after land acquisition will be acquired by the project. The owner of such land/property will have the option to seek acquisition of his entire contiguous holding/ property provided the residual land is less than the average land holding of the district;
- Any structure/asset rendered unviable/unsafe because of the project shall also be considered as affected and entitlements shall be extended accordingly;
- The affected persons who does not own land or other properties, but have economic interests or lose their livelihoods will be assisted as per the policy principles described in this document;
- Cut-off date for titleholders will be the date of publication of notification RFCTLARRA, Act, 2013. For non-titleholders who has not any legal holding of the

occupied land such as squatters and encroachers the date of project **census survey** or a similar designated date declared by the executing agency will be considered as **cut-off date**;

- An entitlement matrix for different categories of people affected by the project has been prepared and provisions will be kept in the budget for those who were not present at the time of census survey. However, people moving in the project area after the cut-off date will not be entitled to any compensation or assistance;
- Vulnerable groups (PAPs below poverty line (BPL), the landless, disabled, elderly persons, women and children, indigenous peoples) will be identified and given additional support and assistance under the project;
- All common property resources (CPR) lost due to the project will be reconstructed or compensated by the project;
- Information related to the preparation and implementation of resettlement plan will be disclosed to all stakeholders and people's participation will be ensured in planning and implementation;
- Appropriate grievance Redressal mechanism will be established at sub-project, state and central levels to ensure speedy resolution of disputes;
- An effective monitoring and evaluation mechanism will be established to ensure consistent implementation of resettlement activities planned under the project including third party monitoring.

B. ENTITLEMENT MATRIX

This entitlement matrix has been developed in accordance with the RFCTLARRA, Act, 2013 and analysis of initial identification of project impacts.

In case where a State Government through any Act or Gazette Notification or as approved by any authority of State Government (duly authorized for the purpose) as per their approved procedure has fixed a rate for compensation of land and is higher than the provisions under the project, the same may be adopted by the Competent Authority in determining the compensation for land.

Similarly, in case where a State Government through any Act or Gazette Notification or as approved by any authority of State Government (duly authorized for the purpose) as per their approved procedure has fixed a rate for resettlement and rehabilitation assistance and is higher than the provisions under the project, the same may be adopted by the Project Authority.

CHAPTER 6

PROJECT SCHEDULE AND COST ESTIMATION

6.1 PROJECT SCHEDULE AND FINANCIAL ANALYSIS:

These items are provided in the Table 6.1 and results of financial analysis are shown in Table 6.2.

Table 6.1: PROJECT SCHEDULE AND FINANCIAL ANALYSIS

Particulars	Details
Total Estimated Cost	Rs.48.19 Crores
Project Cost with Financial overheads (25%) – TPC	Rs. 64.04 Crores
Construction starts at	January 2017
Construction period	18 Months
Road opens to traffic	July 2018
Phasing of Project Cost	1st Year 2017 – 40%
	2nd Year 2018 – 60%

RESULTS OF FINANCIAL ANALYSIS - RETURNS FOR CONCESSION PERIOD

Table 6.2.: Results of Financial Analysis

	25 years
IRR on Equity Investment	15.00%
IRR on Project Investment	13.70%
Average DSCR	1.23

6.2 MAINTENANCE COST

Table 6.2: Maintenance Cost

Particulars	Details
Annual Maintenance Costs	0.0175 Crores Per km
Periodic Maintenance Cost (Every 5th Year)	0.30 Crores Per km
Annual Toll Plaza O&M Cost	0.75 Crores Per toll Plaza
Electrical & Petroleum Cost	0.003 Crores km Per Annum
Insurance Cost	Rs. 0.15%

Chapter 7

Analysis of Proposal (Final Recommendations)

Basically this is state highway so it comes under Cat. B2 but due to the general condition of Wild Life Protection Act 1972 it comes under Cat. "A" Project. Environmental examination ascertains that it is unlikely to cause any significant environmental impacts except Keladevi Wildlife Sanctuary. Few impacts were identified attributable to the project, most of which are localized and temporary in nature and easy to mitigate. Widening and improvement will be mostly accommodated within available land. Land acquisition is restricted for geometric corrections and in the stretches with inadequate right of way.

There are two wildlife sanctuaries within the 10 km radius and involvement of approx. 10.9236 ha forest land so there are requirements of prior environment and wildlife clearances and forest clearance is also required.

Significant environmental impacts attributable to the project pertain to tree cutting, temporary deterioration of environmental attributes/ambient conditions due to construction and site clearance activities, earthworks, borrowing and quarrying, operation of hot mix plants, some deterioration of surface water quality due to silt run-off and spillage from vehicles and discharge from labour camps, health impacts from labour camps, disruption to access/traffic and occupational health and community safety. These impacts can be mitigated by adopting good construction practices and effective implementation of Environmental Management Plan (EMP). During operation stage, the main impacts are increase in mobile emissions, noise level, accident risk to motorists, pedestrians and animals. Road safety measures are proposed as per IRC: SP: 44-1996 like road delineators, signage, and metal beam crash barriers and guide posts etc. Retaining walls have been proposed where ponds are abutting to avoid seepage into sub grade and erosion of road embankment.

Climate risk assessment indicates that the project is at medium risk and it is mainly flooding (increased storminess), which can affect the roads, bridges and embankments. Key engineering measures taken to address these risks in the design are: i) increase in embankment height, ii) construction of new side and lead away drains, iii) construction of new culverts or widening of existing ones and iv) increase in waterway including vertical clearance of bridges.

In general, the subproject received immense support from local people. The local people appreciated that improved connectivity will bear out several socio-economic positive benefits resulting to improved quality of life.

The Environment Impact Assessment Study of the subproject ascertains that the project road may be affect the wild life sanctuary and additional study will be taken for further study. Some protection measures as per suggestion of wild life warden and CCF will be mention in EMP study. The Executing Agency shall ensure that EMP and EMoP are included in Bill of Quantity (BOQ) and forms part of bid document and civil works contract. The same shall be revised if necessary during project implementation or if there is any change in the project design and with approval of MoEFCC.