

# **FEASIBILITY REPORT**

## **1.1 PROJECT BACKGROUND**

Roads are considered the most important component of infrastructure, to which nation's economy either directly or indirectly connected. Odisha is one of the state out of 28 states of India. Odisha is connected to other neighboring states like Jharkhand and West Bengal to the north and northeast, by the Bay of Bengal to the east, and by the states of Andhra Pradesh and Telangana to the south and Chhattisgarh to the west through all-weather high standard roads.

Government of Odisha (the "Authority") intends to develop the road connecting from Phulnakhara to Niali SH-60 under state plan from Ch-0/000 Km to Ch – 35/451 Km in the division of Cuttack.

### **PROJECT DESCRIPTION**

The project road is going to be developed majorly from 2 lane to 4-lane configuration. It is primarily being developed for the Olatpur Hospital's communications. Due to an increase in traffic, this road's primary goal is to provide four lanes of converging traffic for smooth vehicle movement. As the road connects to Cuttack, Bhubaneswar, and Puri, there are numerous tourist attractions nearby, ensuring a smooth and simple connection between these locations. Ultimately, this will lead to the social and economic development of the surrounding towns and villages.

## **1.2 PROJECT OBJECTIVE**

The main objective of the Consultancy service is to establish technical viability of the widening and strengthening proposal.

- Ensure Enhanced safety of the traffic, the road users and people living close to the project stretch
- Ensure enhanced operational efficiency of the project road
- Ensure fulfilment of the access needs of the local population
- Ensure minimal adverse impact on the road users and the local population due to construction
- Provide technical assistance including designing and cost estimation

# **CHAPTER -2: SOCIO-ECONOMIC FEATURES AND PROJECT CORRIDOR**

## **2.1 INTRODUCTION**

Understanding the existing socio-economic characteristics of the Cuttack district Govt of Odisha has decided to improve and strengthening the Nakhara-Niali Stretch on SH-60. The total project road connects from Phulnakhara Chowk to Niali (Ch – 0/000 km) (Ch – 35/451 km) under state plan. This proposal is to develop existing 2-lane to 4-lane Confrugation. A socio-economic assessment of the project state and the project influence area has been attempted in the following sections.

## **2.2 PROJECT ROAD PROFILE**

Project road is starting from Phulnakhara (Ch – 0/000 km) to Niali (Ch – 35/451 km). There are several tourist in the city of Cuttack and Bhubaneswar also along its periphery. Some of the famous places such Barbati fort, Chandi Mandir, Barbati stadium etc. and Dhauli shanti stupa, Lingaraj Temple, Rajarani Temple and the International Airport Bhubaneswar etc. Existing State Highway-60, NH-316 & NH-16 road is very closer to our project road

## **3.1 SALIENT FEATURES OF THE PROJECT ROAD**

The project road in Cuttack division connects the area from Phulnakhara to Niali. The Starting point is Phulnakhara (Ch – 0/000 km) and the end point is Niali (Ch – 35/451 km).The project road is plain terrain.

## **3.2 SETTLEMENT ALONG THE PROJECT CORRIDOR**

The project road passes through the Bhimpur, Mahidharpara, Jagannathpur, Jayarsasan, Kurangasasan, Sundargram, Kantapara, Tihuri,Khulisa.Village.Lands encroached by locals for commercial and residential establishments.

## **3.3 PRELIMINARY SURVEY**

After finalization of the alignment for the project road preliminary survey has been done.

The following factors in reconnaissance survey have been considered:

- a) The reconnaissance survey has been done for all possible alignments, examined and improvements made if required.
- b) Planning should be such that it will not be affected by the growth of the town in the next 20 years.

- c) The alignments were studied to check the constructability of the road. All ponds, water logging areas, structures, habitation, and market areas were kept clear to ease construction and cut down the cost of construction.
- d) The geometries governing the alignment like gradient, curves etc. of geometry standards were considered for planning the alignment. Steep curves were avoided which would have curbed the speed.

The terrain of the area is comparatively flat with cultivation area. The formation of the road needs to be raised above HFL. After studying the alignments a preferable alignment was selected. The observations of the team and the recommendations are provided below.

### **3.4 SOIL SURVEY AND INVESTIGATION OF SOIL PROPERTY**

From soil survey 4 days soaked CBR value has been come in laboratory after collection of soil sample from field along project Road. Grain size analysis has been done for determination of finer % for fine gravel, coarse sand, Medium sand, fine sand and silt & clay. Atterberg's limit (Liquid limit, plastic limit and plasticity index in percentage) has been determine for existing soil along project road after collecting soil at 500 m interval in the direction of existing road. Proctor test has been conducted to determine Maximum dry density and optimum moisture content of these soil sample. Moreover, C.B.R test has been conducted in laboratory at that corresponding MDD and OMC for that specific soil sample in soaked and unsoaked condition. Moisture content after 4 days for this soaked soil has been determined. After that soil classification has been done a/c to IS 1498-1970.

The project road is a Brownfield where selected earth of 8% effective CBR shall be used new embankment construction.

## 4.1 PAVEMENT DESIGN

As this road traffic is 56 msa in 20 years and keeping all the factors in consideration and CBR value is taken as 8%. According to IRC 37:2019 the crust has been taken as follows:

(Stage Construction is adopted for 23 msa )

- i) BC – 30 mm
- ii) DBM – 50 mm
- iii) WMM – 250 mm
- iv) GSB – 200 mm
- v) Sub grade – 500 mm

## 4.2 TRAFFIC SURVEY

Based on the 7-day traffic volume count conducted along the proposed alignment, the estimated average commercial vehicle traffic is 1,422 vehicles per day. This corresponds to a cumulative traffic loading of approximately 28 MSA (Million Standard Axles) over 20 years and 14 MSA over 7 years. The total traffic on the concerned road has been estimated at 22,826 Passenger Car Units (PCU) per day.

## 4.3 SOIL INVESTIGATION

The CBR considered for the alignment is 8%.

## 5.1 DESIGN STANDARDS

The geometric design standards outlined below have been followed for the horizontal alignment and vertical profile. The design standards of all the elements of a project corridor can be grouped into the following categories as given in Table below.

Table 1 Design Elements

SI no	Category	Design element
1	Design capacity	Design service volume standards Design capacity standards
2	Geometric Design	Cross sectional elements Sight distance Horizontal curves Vertical curves

3	<b>Pavement design</b>	CBR, Traffic, Structural strength
4	<b>Cross drainage structures</b>	Bridges and culverts
5	<b>Intersections</b>	Intersections at a grade
6	<b>Slope protection</b>	Side slopes Slope protection
7	<b>Drainage system</b>	Longitudinal, cross drainage
8	<b>Safety measures</b>	Guard rails & safety barriers Traffic signals Road signage & pavement markings Footpaths and sidewalks

## 5.2 BRIEF DESCRIPTION GEOMETRIC DESIGN ELEMENTS OF ROAD

### 5.2.1 Carriage Way

In TCS-1, the formation includes carriageway is of 2x7.5m including kerb shyness (4 lane) width, service road of width 5.5 m in both side, 0.5m of median, along with 1 m RCC Drain. Existing open and 2x7m (4 lane) width along with 1.5m Paved shoulder and 1m drain both sides of road has been proposed.

### 5.2.2 Shoulders

1m earthen shoulder is proposed at Existing open portion.

1.5m paved shoulder proposed over the built-up Section.

### 5.2.3 Drainage

2.5 % Camber in carriageway has been provided for surface water drainage purpose.

### 5.2.4 Sight Distance

The values of intermediate sight distance as per details given in IRC-84:2019 corresponding to the design speed have been adopted. Stopping sight distance has been provided as per specification.

# IMPROVEMENT PROPOSAL

## 6.1 GENERAL

The proposal has been explored based on information collected during site visits and site inspection. The proposed alignments have been clearly shown in the Index map.

## 6.2 ROAD CROSS SECTIONS FOR PROPOSED ALIGNMENT

Project road is starting from Phulnakhara (Ch – 0/000 km) to Niali (Ch – 35/451 km). There are several tourist in the city of Cuttack and Bhubaneswar also along its periphery. Some of the famous places such Barbati fort, Chandi Mandir, Barbati stadium etc. and Dhauli shanti stupa, Lingaraj Temple, Rajarani Temple and the International Airport Bhubaneswar etc. Existing State Highway-60, NH-316 & NH-16 road is very closer to our project road.

The crust is as follows considering 28 MSA and 8% CBR. (Stage construction is adopted as 7 MSA traffic)



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