



**बिहार सरकार,  
पर्यावरण, वन एवं जलवायु परिवर्तन विभाग  
कार्यालय, प्रधान मुख्य वन संरक्षक, बिहार, पटना।**

(कैम्पा एवं वन संरक्षण संभाग)

तृतीय तल, अरण्य भवन, शहीद पीर अली खाँ मार्ग, पटना-800 014

**संख्या व.सं/52/2021-597**

प्रेषक,

अरविन्दर सिंह, भा०व०से०,  
अपर प्रधान मुख्य वन संरक्षक (कैम्पा)  
—सह—नोडल पदाधिकारी (वन संरक्षण),  
बिहार, पटना।

सेवा में,

उप वन महानिदेशक (केन्द्रीय),  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,  
क्षेत्रीय कार्यालय, मेकॉन कॉलोनी  
A-2 श्यामली, राँची-834002

**पटना 14, दिनांक-05/07/2022**

**विषय —** भागलपुर जिलान्तर्गत NH-80 भागलपुर-कहलगाँव-मिर्जाचौकी (132.895-190.150 कि०मी०) पथांश चौड़ीकरण एवं सुदृढीकरण हेतु वन (संरक्षण) अधिनियम, 1980 के तहत 41.559 हे० वन भूमि अपयोजन प्रस्ताव पर पृच्छा अनुपालन के संबंध में।

**प्रसंग —** भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय राँची का पत्रांक FP/BR/ROAD/125806/2021/362 दिनांक 27.06.2022 एवं वन प्रमंडल पदाधिकारी, भागलपुर का पत्रांक 965 दिनांक 05.07.2022 (छायाप्रति संलग्न)।

महाशय,

उपर्युक्त विषय के संबंध में सूचित करना है कि भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय राँची के पत्रांक FP/BR/ROAD/125806/2021/362 दिनांक 27.06.2022 द्वारा मांगी गयी सूचनाओं का निराकरण प्रतिवेदन निम्नलिखित है—

क्रम सं.	पृच्छा	निराकरण
1	Details and girth-wise abstract of the tree-enumeration for the trees that are likely to be affected in proposed forest land by the project.	गोलाईवार पातित एवं पुर्नस्थापित होने वाले वृक्षों का सारांश कार्यपालक अभियन्ता, राष्ट्रीय उच्च पथ प्रमंडल, भागलपुर के पत्रांक 677 (अनु०) दिनांक 04.07.2022 द्वारा उपलब्ध कराया गया है जो इस पत्र के साथ संलग्न है। इसे परिवेश पोर्टल पर अपलोड कर दिया गया है।
2	Locations of the land identified (kml format also) for translocation as well as detailed tree-translocation plan needs to be submitted.	वन प्रमंडल पदाधिकारी, भागलपुर के पत्रांक 965 दिनांक 05.07.2022 द्वारा पुर्नस्थापित होने वाले वृक्षों के लिये स्थल को चिन्हित कर KML File उपलब्ध कराया गया है जिसकी Soft copy इस पत्र के साथ संलग्न है।



3	Cost benefit analysis of the proposed project.	परियोजना से संबंधित Cost benefit analysis कार्यपालक अभियन्ता, राष्ट्रीय उच्च पथ प्रमंडल, भागलपुर के पत्रांक 677 (अनु0) दिनांक 04.07.2022 द्वारा उपलब्ध कराया गया है जो इस पत्र के साथ संलग्न है। इसे परिवेश पोर्टल पर अपलोड कर दिया गया है।
4	Uploaded topo-sheet map of the proposed CA land is apparently incorrect. So corrected toposheet in fine resolution clearly depicting the proposed CA land needs to be uploaded.	क्षतिपूरक वनीकरण के लिये चिन्हित स्थल को टोपोशीट मानचित्र पर अंकित कर दिया गया है साथ ही इसे ऑन लाईन में अपलोड कर दिया गया है।
5	Proposed forest land for diversion is 41.559 ha but as per GIS analysis, total proposed forest land is 40.286 ha (base on uploaded kml file). So it may be Clearfield.	कार्यपालक अभियन्ता, राष्ट्रीय उच्च पथ प्रमंडल, भागलपुर के पत्रांक 677 (अनु0) दिनांक 04.07.2022 द्वारा प्रतिवेदित किया गया है कि परियोजना निर्माण में अपयोजित होने वाली वन भूमि का संशोधित kml file Parivesh Portal पर upload कर दिया गया है। upload kml file का क्षेत्रफल 41.5108 हे0 है जबकि अपयोजित होने वाली वन भूमि 41.559 हे0 है। यह मामूली अन्तर है और इसे GPS accuracy error को मानते हुए स्वीकार किया जा सकता है।

उपर्युक्त तथ्यों के आलोक में अनुरोध है कि विषयगत परियोजना पर सैद्धान्तिक स्वीकृति प्रदान करने की कृपा की जाय।

अनु०—यथोक्त।

विश्वासभाजन



(अरविन्दर सिंह)

अपर प्रधान मुख्य वन संरक्षक (कैम्पा)  
—सह—नोडल पदाधिकारी (वन संरक्षण),  
बिहार, पटना।



बिहार सरकार

पर्यावरण, वन एवं जलवायु परिवर्तन विभाग

कार्यालय, वन प्रमंडल पदाधिकारी, भागलपुर वन प्रमंडल, भागलपुर

सुन्दरवन, हनुमान घाट, बरारी रोड, भागलपुर पिन - 812003

ई-मेल - dfobhagalpur@gmail.com

पत्रांक : - 965

भागलपुर, दिनांक : - 05/07/2022

प्रेषक,

भरत चिन्तपल्लि "भा०व०से०"

वन प्रमंडल पदाधिकारी,

भागलपुर वन प्रमंडल, भागलपुर।

सेवा में,

अपर प्रधान मुख्य वन संरक्षक (कैम्पा),

बिहार, पटना।

विषय :-

भागलपुर जिलान्तर्गत NH-80 भागलपुर - कहलगाँव - मिर्जाचौकी (132.895 - 190.150 कि०मी०) पथांश चौड़ीकरण एवं सुदृढीकरण हेतु वन (संरक्षण) अधिनियम, 1980 के तहत 41.559 हे० वन भूमि अपयोजन प्रस्ताव पर पृच्छा के संबंध में।

प्रसंग :-

भवदीय पत्रांक - 583 दिनांक - 30/06/2022 एवं कार्यपालक अभियंता राष्ट्रीय उच्च पथ प्रमंडल पथ निर्माण विभाग भागलपुर के पत्रांक - 677(अनु०), दिनांक - 04/07/2022

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र द्वारा माँगी गई प्रतिवेदन में पृच्छाओं का निराकरण निम्नवत् है :-।

1	Details and girth - wise abstract of the tree - enumeration for the trees that are likely to be affected in proposed forest land by the project.	प्रयोक्ता एजेंसी द्वारा समर्पित प्रतिवेदन संलग्न।
2	Locations of the land identified (kml format also) for translocation as well as detailed Tree - translocation plan needs to be submitted.	KML File संलग्न है।
3	Cost Benefit analysis of the proposed project.	प्रयोक्ता एजेंसी द्वारा समर्पित प्रतिवेदन संलग्न।
4	Upload topo-sheet map of the proposed CA land is apparently incorrect. So corrected toposheet in fine resolution clearly depicting the proposed CA land needs to be uploaded.	प्रधान मुख्य वन संरक्षक, बिहार, पटना (कैम्पा एवं वन संभाग) के पत्रांक - व.सं./56/2021-393 दिनांक - 13/04/2021 में दिए गए निदेशानुसार Topo-Sheet map of proposed CA land का प्रस्ताव मुंगेर वन प्रमंडल मुंगेर से संबंधित है।
5	Proposed forest land for diversion is 41.559 ha but as per GIS analysis, total proposed forest land is 40.286 ha (base on uploaded kml file). So it may be Clearfield.	प्रयोक्ता एजेंसी के द्वारा समर्पित पत्र के अनुसार संशोधित GIS Map को परिवेश पोर्टल पर अपलोड कर दिया गया है।

सूचनार्थ समर्पित।

अनु०: - यथोक्त।

विश्वामाजु

वन प्रमंडल पदाधिकारी,

भागलपुर वन प्रमंडल, भागलपुर।



ज्ञापांक:- 965 दिनांक 5/2/22

प्रतिलिपि:- वन संरक्षक भागलपुर अंचल , भागलपुर को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,  
भागलपुर वन प्रमंडल, भागलपुर।

ज्ञापांक:- 965 दिनांक 5/2/22

प्रतिलिपि:- क्षेत्रीय मुख्य वन संरक्षक, भागलपुर को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,  
भागलपुर वन प्रमंडल, भागलपुर।

ज्ञापांक:- 965 दिनांक 5/2/22

प्रतिलिपि:- वन प्रमंडल पदाधिकारी मुंगेर को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,  
भागलपुर वन प्रमंडल, भागलपुर।

ज्ञापांक:- 965 दिनांक 5/2/22

प्रतिलिपि:- कार्यपाल अभियंता राष्ट्रीय उच्च पथ प्रमंडल, पथ निर्माण विभाग, भागलपुर को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

वन प्रमंडल पदाधिकारी,  
भागलपुर वन प्रमंडल, भागलपुर।

# कार्यपालक अभियंता का कार्यालय

राष्ट्रीय उच्च पथ प्रमंडल, पथ निर्माण विभाग, भागलपुर।

Email id: eenhbhagalpur1@gmail.com

पत्रांक:— 677 (अनु०)

भागलपुर

दिनांक:— 4/7/2022

प्रेषक :—

कार्यपालक अभियंता,  
राष्ट्रीय उच्च पथ प्रमंडल,  
पथ निर्माण विभाग, भागलपुर।

सेवा में,

वन प्रमंडल पदाधिकारी,  
भागलपुर।

विषय:— भागलपुर जिलान्तर्गत NH-80 भागलपुर— कहलंगॉव—मिर्जाचौकी (132.895—190.150 कि०मी०) पथांश चौड़ीकरण एवं सुदृढीकरण हेतु वन (संरक्षण) अधिनियम, 1980 के तहत 41.559 हे० वन भूमि अपयोजन प्रस्ताव पर पृच्छा के संबंध में।

प्रसंग:— श्री नन्द कुमार मांझी, उप वन संरक्षक का पत्रांक व.स./52/2021—583 दिनांक 30.06.2022

महाशय,

भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय राँची द्वारा विषयांकित पृच्छा का उत्तर कंडिकावार निम्नवत दी जा रही है :—

(i) परियोजना के कारण/पातित होने वाले पृष्ठों की गणना का सार मुटाई के अनुसार तालिकाबद्ध कर Parivesh Portal पर Upload कर दिया गया है। (सुलभ प्रसंग हेतु प्रति संलग्न)

(ii) पृच्छा वन एवं पर्यावरण विभाग से संबंधित है।

(iii) Cost - Benefit Ratio (EIRR) Parivesh Portal पर Upload कर दिया गया है।

(iv) पृच्छा वन एवं पर्यावरण विभाग से संबंधित है।

संशोधित GIS Map को Parivesh Portal पर Upload किया जा चुका है। Uploaded Map के अनुसार क्षेत्रफल 41.5108 हे० है जबकि प्रस्तावित क्षेत्रफल 41.559 हे० है। यह ममूली अंतर है और GPS accuracy error के रूप में स्वीकार किया जा सकता है।

अनु०—यथोक्त।

विश्वासभाजन

4/7/2022

कार्यपालक अभियंता,

रा०उ०प० प्रमंडल, प०नि०वि०, भागलपुर।



**Abstract of trees that are likely to be affected in NH-80 from  
KM 132.895 to 190.150**

**Abstract of tree to be cutting**

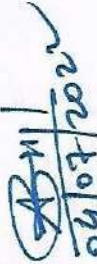
A	Sl.No.	Girth Size	0 - 30 cm	31 - 60cm	61 - 90cm	91 - 120cm	121 - 150 cm	>150 cm	Total
	1	LHS	60	224	283	513	389	466	1935
	2	RHS	51	187	306	504	310	379	1737
		Total	111	411	589	1017	699	845	3672

**Abstract of tree to be translocate**

B	Sl.No.	Girth Size	0 - 30 cm	31 - 60cm	61 - 90cm	91 - 120cm	121 - 150cm	>150 cm	Total
	1	LHS	167	964	462	0	1	1	1595
	2	RHS	171	763	362	0	0	0	1296
		Total	338	1727	824	0	1	1	2891

**Total nos. of trees that are likely to be affected in NH-80 = A + B**

3672	+	2891	=	6563
------	---	------	---	------

  
 Executive Engineer  
 N.H. Division, R.C.D., Bhagalpur.

Abstract of tree Counting in NH-80 From Km 132.895  
(Zeromile Bhagalpur) to Km 190.150 (Mirzachouki)

S.No	Particulars	Trees in LHS	Trees in RHS	Total No of Trees
1	Cutting (C)	1935	1737	3672
2	Translocation (T)	1595	1296	2891
3	Total no of Trees	3530	3033	6563

*[Signature]*  
14.1.22  
JE

*[Signature]*  
14/01/2022  
A.E

*[Signature]*  
14/01/2022  
Kaf

*[Signature]*  
15/01/22  
Arboriculturist

*[Signature]*  
12/1/22  
Divisional Forest Officer  
Bhagalpur Forest Division  
6/1/22



**Rehabilitation and Widening work for 2- Lane with Paved Shouldering of  
Existing National Highway 80 Alignment from Km. 132.895 to Km. 190.150  
Bhagalpur – Kahalgaon – Mirzachowki Section of Length 57.255 Km. in the  
State of Bihar.**

**Cost Benefit Analysis**

**Content**

<b>Sl. No.</b>	<b>Description</b>
1.1	Approach and Methodology
1.2	Definition of "Without Project" and "With Project" Situation
1.2.1	HDM Model Input Data
1.2.2	Project Cost and Scheduling
1.2.3	Project Cost
1.2.4	Homogeneous Section Based On Traffic Survey Data
1.2.5	Road Condition and Pavement Design
1.3	Economic Cost of Vehicle Parameters
1.4	Construction Package wise Economic Internal Rate of Return
1.5	Sensitivity Analysis
1.6	Conclusion
<b>Tables</b>	
1.1	Homogenous sections (Pavement Carriageway wise)
1.2	Estimated Cost for Construction
1.3	Homogeneous Traffic Sections
1.4	Percentage Composition of Fast Vehicles
1.5	Percentage Composition of Slow Vehicles
1.6	Summary of Traffic Growth Rate in % (Fast Moving Vehicle)
1.7	Summary of Traffic Growth Rate in % (Slow Moving Vehicle)
1.8	Details of existing Pavement Conditions
1.9	Speed Flow Relationship Data
1.10	Summary of Economic Cost of Vehicle Data
1.11	Construction Package wise Result of Economic Evaluation
1.12	Construction Package wise Sensitivity Analysis Results



## 1.0 Cost Benefit Analysis

### 1.1 Approach & Methodology

The objective of the economic evaluation is to enable Government authorities to determine whether the project is economically worthwhile investment proposal and whether it should be taken up at all. This is done by identification of the potential benefits expected to accrue to the community and comparison with the economic costs of the project.

Economic viability of the project has been assessed within the broad framework of the cost-benefit analysis technique, which is widely used in the appraisal of public investment projects. Economic analysis involves comparison of cost and benefit streams under both the "without" and "with" project conditions, over a fixed analysis period.

The "without project" situation is the base case option or the "do-minimum" case where the project road is a Intermediate Lane/2-lane National Highway. In the "with project" situation, it is upgraded to a 2-lane highway with paved shoulders. All costs and benefits considered in the study have been valued in monetary terms and expressed in economic prices to reflect the true resource cost to the economy.

The economic analysis has been carried out using the HDM IV Model.

The results have been expressed in terms of Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) of the project at 12 percent discount rate. These are calculated using discounted cash flow methods since costs are incurred and benefits accrue at different dates. The feasibility of the project is determined by comparing the EIRR with the current accounting rate of 12%. This represents the opportunity cost of capital and is considered the appropriate minimum criterion for economic viability by Government Agencies as well as Funding Agencies.

The project is further subjected to sensitivity analysis by varying the project costs and benefits by 15% and the effect on the EIRR reviewed. This helps to gauge the economic strength of the project to withstand future risks and uncertainties.

The analysis has been carried out for each homogenous section and for the total project road. These are given in the Table

**Table 1.1: Homogenous sections**

Sl. No.	Section Details / Chainage	Section Name	Length in Km.	Carriageway Including Paved Shoulder in m
<b>Construction Package-1 : Km. 132.895 to Km. 190.150</b>				
Section-1	132.895 to 135.000	Baghalpur Built-up Section	2.105	10.00
Section-2	135.000 to 138.000	Prem Nagar, Sabour & Khankitta Built-up Zone	3.00	7.00
Section-3	138.000 to 152.000	Khankitta - Pakkisarai	14.00	5.50
Section-4	152.000 to 190.150	Pakkisarai - Kahalgaon - Pirpanti - Mirzachowki	38.150	7.00



## 1.2 Definition of “Without Project” and “With Project” Situation

The HDM-IV model, Version 1.3 is used for the analysis of the data

The HDM-IV analytical framework is based on the concept of pavement life cycle analysis. This predicts the life cycle pavement conditions and costs over a specified analysis period under a user-specified scenario of circumstances. This is applied to predict pavement deterioration arising from traffic loading, environmental, weathering and effect of inadequate drainage systems over the life cycle of a road pavement

Technical analysis within HDM is undertaken using four sets of models:

- RD (Road Deterioration) predicts pavement deterioration
- WE (Works Effects) simulates the effects of road works on pavement condition and determines the corresponding costs
- RUE (Road User Effects) determines costs of vehicle operation, road accidents and travel time
- SEE (Social and Environmental Effects) determines the effects of vehicle emissions and energy consumption

The Model simulates, for each road section, year-by-year, the road condition and resources used for maintenance under each strategy as well as the vehicle speeds and physical resources consumed by vehicle operation. After physical quantities involved in construction, road works and vehicle operation are estimated, user-specified prices and unit costs are applied to determine financial and economic costs. Relative benefits are then calculated for different alternatives, followed by present value and rate of return computations.

The costs considered comprise agency costs and costs to road users as follows.

### **Road Agency costs**

- Construction Cost
- Maintenance Cost

### **Road Users Costs**

- Vehicle Operating Cost
- Travel Time Costs

Road users experience different costs in the “With Project” and “Without Project” conditions. The benefits to road users are constituted by the savings in costs. Increasing traffic volumes as a result of the project implies more vehicle kilometers and hence more vehicle operating costs and, possibly showing more saving in with project conditions viz. benefits as a result of the project.

Based on traffic, Road network and Socio-economic characteristics of the project road, two different improvement options(with project) have been considered by the consultants with two different combination of proposed up-gradation/ improvement Options (Bypasses / without Bypasses) of the project road. The Economic analysis is carried out for the following improvement options

1. “Without project/ Do minimum” – No Improvement of the existing road
2. “With Project”- Widening of the Project road to 2 Lane with Paved shoulder.



### 1.2.1 HDM Model Input Data

The basic input data used for the application of HDM-4 have been grouped into following categories:

- General
- Traffic
- Road Condition and Pavement design

The analysis period is from year 2021 to 2050. The base year for traffic and cost estimates is 2020. A 24 months construction period from 2021 to 2023 and benefit period of 30 years from year of opening i.e. 2024 have been considered.

### 1.2.2 Project Cost and Scheduling

- *Pavement Option* : Rigid Pavement have been Proposed for Two lane with Paved shoulder + Earthen shoulders configuration of existing Intermediate / 2-lane roads
- *Construction Period* : Construction period for the project has been assumed as 24 months i.e. March 2021 to March 2023.
- *Investment Schedule* : For construction period, the distribution of cost for each year is given as below:  
1<sup>st</sup> Year - 40 %  
2<sup>nd</sup> Year - 60 %
- *Analysis Period* : 30 years (2021 – 2050)
- *Discount rate* : 12%
- *Salvage Value* : 15%

### 1.2.3 PROJECT COST

Estimated cost for project option is as given in Table 1.2 below.

Table 1.2: Estimated Cost for Construction

Construction Package-1: Km. 132.895 to Km. 190.150	Construction Cost (Rs. in million)
New Two lane carriageway with Paved shoulder configuration + Earthen shoulders of Intermediate / Two Lanes (Total Project Cost = Civil Cost + R&R costs + Environment cost + Shifting of utilities + Forest Clearance Cost + Land Acquisition Cost + Centages)	5843

The foreign exchange component in the total capital cost is insignificant and has been considered to be zero, as all material, machinery and labour are available in India. Standard

Conversion factor of 0.85 has been used for converting market prices of road construction and maintenance inputs into economic costs.

#### **Maintenance Cost**

#### **Maintenance Cost**

##### **For Intermediate lane road**

Routine maintenance cost	-	Rs. 5.00 lakhs per km per year
Periodic maintenance cost	-	Rs 1870 per sq.m (Cost of 40mm BC overlay at 5 year interval)

#### **Maintenance Cost**

##### **For Two lane highway**

Routine maintenance cost	-	Rs. 7.00 lakhs per km per year
Periodic maintenance cost	-	Rs 2250 per sq.m (Cost of 40 mm BC overlay at 5 year interval)

### **1.2.4 HOMOGENEOUS BASED ON TRAFFIC SURVEY DATA**

Based on the data of the traffic surveys conducted by the consultants in November 2020, the project road has been divided into Single homogeneous traffic sections. The Average Daily Traffic (ADT) are shown in Table 1.3. Homogeneous sections based on carriageway type are furnished in Table 1.1.

**Table 1.3: Homogeneous Traffic Sections**

Section	Chainage (km)*	Length (km)	AADT (2020) (Numbers)		
			Fast	Slow	Total
1	Km. 132.895 – 190.150)	57.255	10275	2657	12950

Note: \* Surveyed Chainage

**Table: 1.4 Table Percentage Composition of Fast Vehicles**

Type of Vehicle	Section-1
Two-wheeler	17.21
Car/Jeep/Auto/Tempo	14.68
Bus/Mini Bus	5.90
2-Axle Trucks	2.61
M-Axle Truck	40.19
LCV	2.61
Tractors With Trailor	2.57

**Table 1.5 : Table Percentage Composition of Slow Vehicles**

Type of Vehicle	Section-1
Cycle	88.40
Cycle Rickshaw & Other	11.60



**Table 1.6: Summary of Traffic Growth Rate in % (Fast Moving Vehicle)**

Type of Vehicle	2020-2025	2025-2030	2030-2035	Beyond 2035
Two-wheeler	8.74	8.24	7.74	7.24
Auto/Tempo/Car/Jeep	7.97	7.47	6.97	6.47
Bus	6.38	5.88	5.38	4.88
2-Axle Trucks	8.08	7.58	7.08	6.58
M-Axle Truck	8.08	7.58	7.08	6.58
LCV	8.08	7.58	7.08	6.58
Tractors With Trailor	8.08	7.58	7.08	6.58

**Table 1.7: Summary of Traffic Growth Rate in % (Slow Moving Vehicle)**

Type of Vehicle	2020-2025	2025-2030	2030-2035	Beyond 2035
Cycle	2	2	1	1
Cycle Rickshaw	2	2	1	1

### 1.2.5 ROAD CONDITION AND PAVEMENT DESIGN

Road and pavement characteristics obtained from the Road Inventory Survey have been used as Model input. These include road length, carriageway width, width of paved shoulders, existing pavement composition, sub-grade CBR, roughness of the existing road (IRI), structural number, BBD and cracking area.

**Table 1.8: Details of existing Pavement Conditions**

Sl. No.	Section Details / Chainage	Section Name	Length in Km.	Carriageway Including Paved Shoulder in m
<b>Construction Package-1 : Km. 132.895 to Km. 190.150</b>				
Section-1	132.895 to 135.000	Baghalpur Built-up Section	2.105	10.00
Section-2	135.000 to 138.000	Prem Nagar, Sabour & Khankitta Built-up Zone	3.00	7.00
Section-3	138.000 to 152.000	Khankitta - Pakkisarai	14.00	5.50
Section-4	152.000 to 190.150	Pakkisarai - Kahalgaoon - Pirpanti - Mirzachowki	38.150	7.00

**Construction Package: Km. 132.895 to Km. 190.150**

Description of Item	Section 1	Section 2	Section 3	Section 4
	132.895 to 135.000	135.000 to 138.000	138.000 to 152.000	152.000 to 190.150
Carriageway Width (Existing)	10	7	5.50	7.00
Soft Shoulder	2+2	1.5+1.5	2.0+2.0	2+2
Rise and fall	1.65	2.85	12.261	8.65



Description of Item	Section 1	Section 2	Section 3	Section 4
	132.895 to 135.000	135.000 to 138.000	138.000 to 152.000	152.000 to 190.150
Curvature (deg/Km)	149	264	126	134
Existing Pavement Thickness	620	660	640	640
BC	40	40	40	40
BM / DBM	145	140	110	110
WBM/WMM	300	280	290	275
GSB	200	200	190	180
Avg IRI (m/km)	7.4	9.15	13.29	10.205
Avg area of cracks (%)	6.10	11.45	18.65	12.40
Avg Potholes (No/Km)	3	9	34	12
Avg Ravelled (%)	2.26	7.32	32.65	12.75
Avg Rut Depth mm	50	65	160	96
Deflection (mm)	2.14	2.67	-	2.90
CBR (%)	5	5	5	5

**Table 1.9: Speed Flow Relationship Data**

Project Option	Capacity	Jam Speed	Speed Limit
Existing Intermediate Lane	1200 PCSE/lane/hr	15 Kmph	40 Kmph
Widening to 2 Lane	1400 PCSE/lane/hr	20 Kmph	80 Kmph

### 1.3 ECONOMIC COST OF VEHICLE PARAMETERS

The economic cost of vehicle parameters like new vehicle cost, new tyre cost, fuel cost, lubricating oil cost, time value cost and cargo cost taken from Manual on Economic Evaluation of Highway Projects in India after converting it to present day Market Rate. The summary of these values is furnished in Table 1.10.

**Table 1.10: Summary of Economic Cost of Vehicle Data**

S. No.	Vehicle Type	New Vehicle Cost (Rs)	New Tyre Cost (Rs)	Fuel Cost (Rs/Lit)		Engine Oil (Rs/Lit)	Time Value (Rs/Hr)	Cargo Cost (Rs/Hr)
				Petrol	Diesel			
1	Car/ Jeep/Van	6,75,950	5,000	84.00	-	380.00	52.5	-
2	Mini bus	18,08,250	7,020	-	75.00	380.00	14.5	-
3	Bus	34,21,050	11,525	-	75.00	380.00	14.5	-
4	3 W	2,10,000	400	-	23.75	80.00	30.0	-



S. No.	Vehicle Type	New Vehicle Cost (Rs)	New Tyre Cost (Rs)	Fuel Cost (Rs/Lit)		Engine Oil (Rs/Lit)	Time Value (Rs/Hr)	Cargo Cost (Rs/Hr)
				Petrol	Diesel			
5	2 W	75,380	650	27.00	-	80.00	22.0	-
6	LCV	14,26,900	3,020	-	23.75	80.00	-	5.00
7	2 A	32,46,800	6,120	-	23.75	80.00	-	15.00
8	MAV	40,42,325	6,120	-	23.75	80.00	-	25.00

#### 1.4 Economic Internal Rate of Return (EIRR)

**Table 1.11: Result of Economic Evaluation**

Option	IRR (%)	NPV (Rs. Million)
Road Widening to two lane highway with Paved Shoulder in Built-up Section (With Time Saving)	26.90	6764

#### 1.5 Sensitivity Analysis

Sensitivity Analysis has been carried out as per described in TOR, to examine the effect on economic viability of the project due to change in the level of the key input factors, including construction cost, variation in traffic etc. The sensitivity of the IRR and NPV has been studied under the following change in conditions.

- Scenario - I : Base Costs and Base Benefits.  
Scenario - II : Base Costs plus 15 % and Base Benefits.  
Scenario - III : Base Costs and Base Benefits minus 15%.  
Scenario - IV : Combination of Scenario II and III

The sensitivity analysis results of above scenarios are given in Table 1.12

**Table 1.12: Sensitivity Analysis Results**

Scenario	IRR (%)
I.	26.90 %
II.	22.64 %
III.	23.17 %
IV.	19.84 %

#### 1.6 CONCLUSION

From the above results of the economic analysis including sensitivity analysis, it can be seen that for all the scenarios, the EIRR is getting higher than the accepted value of 12% for given project. So that, it can be concluded that economically it is beneficial to road users by this improvement.

# कार्यालय, वन प्रमंडल पदाधिकारी, बांका वन प्रमंडल, बांका

आजाद चौक, बाबू टोला, बांका-813102

E-mail-dfo.banka@gmail.com



पत्रांक- 1023

प्रेषक,

अभिषेक कुमार सिंह, (भा0व0से0)  
वन प्रमंडल पदाधिकारी,  
बांका वन प्रमंडल, बांका।

सेवा में,

अपर प्रधान मुख्य वन संरक्षक (कैम्पा)  
—सह—  
नोडल पदाधिकारी (वन संरक्षण),  
बिहार, पटना।

बांका, दिनांक-05/07/2022

विषय :- भागलपुर जिलान्तर्गत NH-80 भागलपुर-कहलगांव-मिर्जाचौकी (132.895-190.150 कि०मी०) पथांश चौड़ीकरण एवं सुदृढीकरण हेतु वन (संरक्षण) अधिनियम-1980 के तहत 41.559 हे० वनभूमि अपयोजन प्रस्ताव पर पृच्छा के संबंध में।

प्रसंग :- भवदीय ज्ञापांक-व०स०/56/2021-583 दिनांक-30-06-2022

महाशय,

उपर्युक्त विषयक प्रसांगिक पत्र के संबंध में सूचित करना है कि, विषय से संबंधित मांगी गई भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, क्षेत्रीय कार्यालय, राँची के पत्रांक-FP/BR/Road/125806/2021/362 दिनांक-27-06-2022 से कंडिका संख्या-4 का अनुपालन प्रतिवेदन पत्र के साथ संलग्न कर भेजी जा रही है।

सूचनार्थ एवं अग्रेतर कार्रवाई हेतु समर्पित।

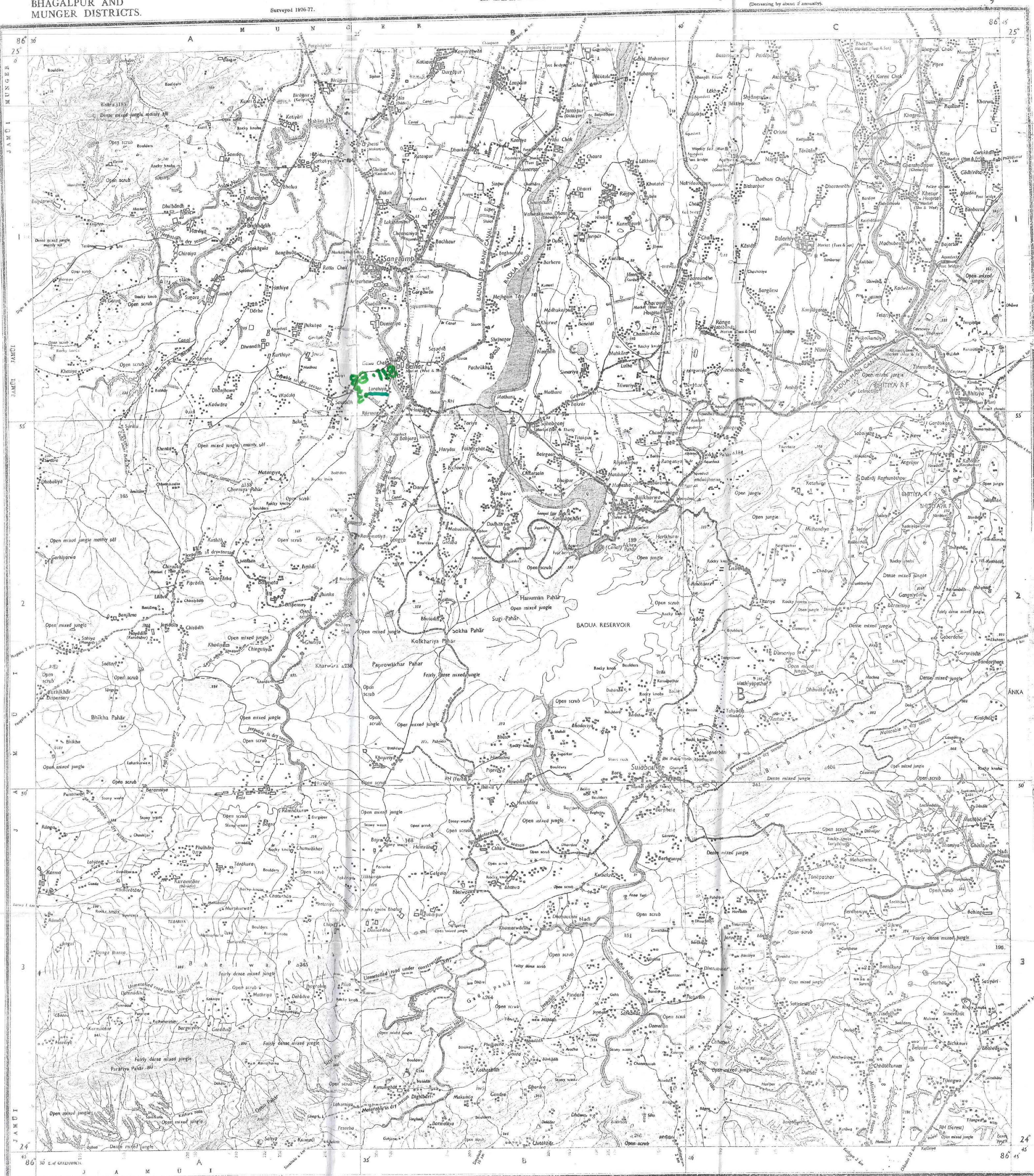
अनु०-यथोक्त।

वन प्रमंडल पदाधिकारी,  
बांका वन प्रमंडल, बांका।



BHĀGALPUR AND  
MUNGER DISTRICTS.

Surveyed 1976-77.

[illegible]

Index to Sheets

$72 \frac{K}{6}$	$72 \frac{K}{12}$	$72 \frac{K}{18}$
$72 \frac{L}{5}$	$72 \frac{L}{9}$	$72 \frac{L}{15}$
$72 \frac{L}{6}$	$72 \frac{L}{10}$	$72 \frac{L}{15}$

भारत के महामन्त्र, मेजर-जनरल किशोर बास शर्मा के निदेश पर प्रकाशित  
Published under the direction of Major-General Kishori Lal Sharma

1:50,000

HEIGHTS & CONTOURS IN METRES  
CONTOUR INTERVAL 10 METRES

\*Water features are shown in blue where they generally contain water.  
 \*Cultivated areas are coloured yellow.  
 The exterior boundaries of areas of Reserved or Protected Forests are shown by green ribbons.  
 Wounded are trees and other

\* Not applicable.

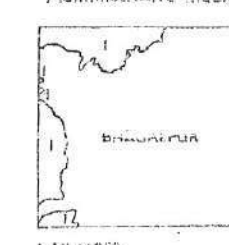
All unmetalled roads along canals are motorable in dry season whereas the cart-roads are passable in dry season. Permission to use those required from the Irrigation authorities.

A relative height, e.g., of marker along a canal, indicates the height of the top of the canal embankment above the adjacent country.

Tanks, shown dry, in this area usually contain water from July to November.

Forest boundaries have not been shown (no forest or reliable indication).

Administrative Index



Towns or Villages (suburban districts)		Parishes of the Diocese of the Holy Spirit		Diocese of the Holy Spirit	
Town of Krasnodar					
Parishes: Cherkov, Bogoyavlenskaya, Zvezdnyy					
Parishes: Cherkov, Bogoyavlenskaya, Zvezdnyy					
Lighthouses: Lighthouses, Bogoyavlenskaya, Zvezdnyy					
Mine, Iron in the Bogoyavlenskaya, Zvezdnyy					
Boundary: Bogoyavlenskaya, Zvezdnyy					
<p>✓ district, subdistrict, or village forest</p> <p>Boundary pillars surveyed, indicated, village irrigation</p> <p>Highways, surveyed, station, approximate</p> <p>Benchmark, surveyed, railway, canal</p> <p>Parishes, surveyed, village, police, station</p> <p>Parishes, surveyed, village, police, station</p> <p>Parishes, surveyed, village, police, station</p> <p>✓ district, subdistrict, or village forest</p> <p>Boundary pillars surveyed, indicated, village irrigation</p> <p>Highways, surveyed, station, approximate</p> <p>Benchmark, surveyed, railway, canal</p> <p>Parishes, surveyed, village, police, station</p> <p>Parishes, surveyed, village, police, station</p> <p>Parishes, surveyed, village, police, station</p>					

GOVERNMENT OF INDIA COPYRIGHT, 1980.  
Price: Thirteen Rupees.

REFER TO THIS MAP AS :- 1:50,000  
SHEET 72 L/9 FIRST EDITION

INDIA भारत

Scattered  
even but  
lack  
these

Index: -

① Site for compensatory  
Afforestation.

② Toposheet No. 72 L/9

③ 93-118 Eo compensatory  
plantation Loxahiya P.F.

Bench-mark: gaedeti  
Post office: Talgaikh off  
Burglous: dda or travel  
Circuit: hosis. Cauping  
Circuit: hosis. Cauping  
Circuit: hosis. Cauping  
Circuit: hosis. Cauping

① Site for compensatory  
Afforestation.

② Toposheet No. 72 L/9

③ 93-118 Eo compensatory  
plantation Loxahiya P.F.

वन प्रमंडल पदाधिकारी  
बॉक्स वन प्रमंडल, बॉक्स