

**Project Name :** Improvement and Up-gradation of NH-731 to 2-Lane with Paved Shoulder from Km 40.00 to Km 88.750 under Package 1 in Shahjahanpur District and Forest Division **(Total Length-48.75 Km of Package 1)**  
**Proposal No. :** FP/UP/ROAD/148376/2021

## Project Description

### Project Brief

Ministry of Road Transport & Highways (MORTH), an apex organization under the Central Government, is entrusted with the task of formulating and administering in consultation with other Central Ministries / Departments, State Governments / UT Administrations, organization and individuals, policies for Road Transport, National Highways and Transport Research with a view to increase the mobility and efficiency of the road transport system in the country.

Ministry of Road Transport and Highways through NHAI planned for improvement and up-gradation of Stretch of Palia, Shahjahanpur via Hardoi-Lucknow length 270 Km (in principle declared National Highways) in the State of Uttar Pradesh under package RO/LKO/DPR/I.P.NH/Pkg-VI.

The salient features of the project stretch of Palia, Shahjahanpur via Hardoi - Lucknow are described as follows:

- Project stretch connects major towns / settlements along Palia Kalan, Mailani, Khutar, Powayan, Shahjahanpur, Shahabad, Hardoi, Sandila, Lucknow, etc.
- Total length of the Project Highway alignment is 266.014 km
- Land use is predominantly agriculture.
- Forest stretch is situated near Mailani (14.645 Km)
- Existing corridor has bituminous pavement.
- Existing road between Palia Kalan and Shahjahanpur is 2-Lane carriageway (Package 1), Shahjahanpur and Hardoi is 4-Lane divided carriageway (Package 2), Hardoi to the district boundary of Lucknow is 2-Lane with paved shoulder (Package 3) and the existing road located in district of Lucknow is 2-Lane Road and is being developed to 4-Lane divided carriage way and is nearing completion (Package 4).

Bypasses are proposed to the alignment where it passes through congested and populated areas in the locations Khutar, Powayan, Shahjahanpur, Shahabad and Hardoi.

District map showing project alignment is shown in figure below.

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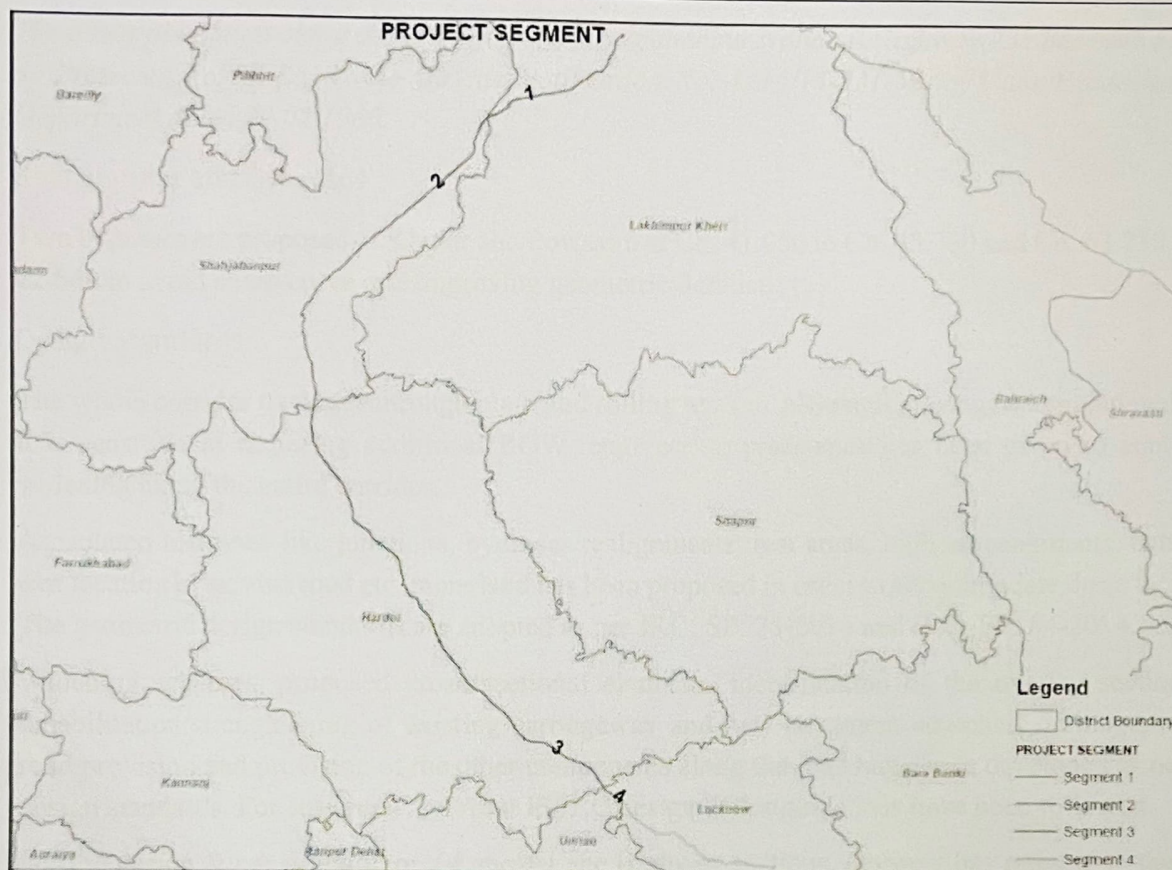
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**Figure1: Project Alignment in respect to Uttar Pradesh District Map**

#### Present Status

The project stretch under discussion is Improvement and Up-gradation of Existing Road (NH-731) to 2-Lane with Paved Shoulder and Service Road from Km 40.00 to Km 88.75 of NH-731, Start of Khutar Bypass to Start of Shahjahanpur Bypass in Shahjahanpur District of NH-731 in the State of Uttar Pradesh under Shahjahanpur Forest Division of Uttar Pradesh State (Total Length- 48.75 Km of Sub-Package 1).

This site comprises of Two Lane with Paved Shoulder and Service Road Project Highway for the section of Khutar-Shahjahanpur National Highway-731. The project road starts at Km 40.00, Salnahan Village, Shahjahanpur District and ends at Km 88.75, Paina Bujurg Village, Shahjahanpur District in the state of Uttar Pradesh. The abovementioned section of NH-731 is mostly running through plain terrain.

Existing NH-731 Road (Package 1) was seeing by PWD with 32 m of ROW. In which, only 12 m ROW was used for existing road with FCA diversion. Remaining area was left for future purpose. Now NHAI is going to take care of this section and proposed for construction with upgradation of that section to 2-lane with paved shoulder and service road.

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*The linear plantation along the side of Khutar-Shahjahanpur National Highway-731 has been notified as Protected Forest Land vide Gazette Notification No. 1115/14-331-50, of Uttar Pradesh Forest Department dated 20.02.1960.*

#### Realignment and Bypasses

Two bypasses are proposed at Khutar and Powayan at Ch. 41.050 to Ch. 45.760 and Ch. 63.730 to Ch. 72.560 to avoid sharp curve and improving geometric deficiency.

#### Design Standards

The whole corridor traverses through plain and rolling terrain. Although in congested/populated areas it is sensitive in acquiring additional ROW, engineering preference has been given to concentric widening along the entire corridor.

At isolated locations like junctions, bypasses/realignments, rest areas, high embankments, entry and exit location of service road etc. more land has been proposed in order to accommodate these facilities. The geometric design standards are adopted as per IRC: SP: 73-2015 and IRC: SP: 84-2014.

Widening schemes, proposed cross sectional elements, identification of the overlay sections for rehabilitation/strengthening of existing carriageway and new pavement stretches, drainage, service road provision and provision of the other components along the road have been developed as per IRC design standards. For structures, relevant IS/IRC design codes/guidelines have been followed.

For the design & construction of 2-Lane/4-Lane Highway sections, designer has referred to the latest IRC publications and NHAI circulars regarding design standards for National Highways in India. The relevant Indian and international design standards referred include:

- IRC: SP: 73-2015 "Manual of Specifications and Standards for Two Laning of Highways with Paved Shoulder".
- IRC: SP: 84-2014 "Manual of Specifications & Standards for Four Laning of Highways Through Public Private Partnership".
- Manual on Uniform Traffic Control Devices – 2009, a standard manual for road signing from United States Federal Highway Administration. Referred to introduce S-Curve signage (W1-4R and W1-4L) which is not provided in IRC 67 – 2012 Code of Practice for Road Signs (Third Revision)

#### Traffic

To establish the traffic characteristics along the project road, consultants have carried out 24 hour 7-day classified traffic volume count, intersection turning movement surveys, O-D surveys, willingness to pay surveys, pedestrian surveys, axle load surveys and speed-delay survey.

Traffic Volume as observed at different location in Package 1 is tabulated below.

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S. No.	Existing Chainage	ADT in PCUs	AADT in PCUs	Tollable (%)	Non-Tollable (%)
1	63.40	8384	8717	50.36	49.64

As per IRC: SP: 73-2015 “Manual of Specifications and Standards for Two Laning of Highways with Paved Shoulders” and IRC: SP: 84-2014 “Manual for Specifications & Standards for Four Laning of Highways through Public Private Partnership” are used for design service volume reference. Based on these guidelines, IRC: SP: 73 – 2018, capacity of 2-Lane highway is considered 10,000 PCU/Day as per the circular RW/NH – 33044/37/2015/S & R (R) dated 26th May 2016 and IRC: SP: 84 – 2014, capacity of 4-lane highway is considered 40000 PCU/Day (This capacity might be under revision, no circular was found) for level of service ‘B’.

Capacity augmentation proposals (Lane requirement) – Projected traffic for each section is compared with design service volume mentioned in IRC: SP: 73-2015 and IRC: SP: 84-2014. Further capacity analysis is carried out for projected traffic and Capacity Augmentation Plan and Lane requirement is worked out on the basis of projected traffic levels.

Project shall experience traffic in the tune of 22544 in the year 2049-50 under most likely scenario.

#### Pavement

The design for new pavement of flexible as well as strengthening of existing pavement has been carried out as per IRC: 37-2012, “Tentative Guidelines for the Design of Flexible Pavements”.

Moreover, existing carriageway is of flexible type and the widening proposed is concentric to avoid the high land cost in the case of eccentric widening, so it would be more convenient to construct & maintain the flexible pavement option. Therefore, it is recommended to use flexible pavement option for the project highway. For the reserve forest stretch, only overlaying to the existing pavement has been proposed.

#### Cross Drainage Structures

##### Major Bridge

Sr. No	Existing (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Super Structure	Sub-structure	Foundation		
1	53.053	2 longitudinal Girders with RCC Deck	RCC wall piers	Not visible	4 X 26	9

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Sr. No	Existing (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Super Structure	Sub-structure	Foundation		
2	73.798	Brick Masonry Arch	Brick Masonry Piers	Not visible	9x9	7.1
3	83.030	PSC Box Girder + 2 longitudinal girders	Masonry wall piers	Not visible	3x10.5 + 1x25.2 + 1x31.5 + 1x16.8	5.5

#### Minor Bridges

Existing Minor Bridge					
Sr. No	Existing Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)
		Super Structure	Sub-structure		
1	59+515	Timber planks on steel girders	Brick structure	Not visible	5x5.5
2	70+496	RCC Slab	Brick Abutment and Pier	Not visible	2x4.8
3	80.111	Brick Masonry Arch	Brick Masonry Piers	Not visible	3x2.5

#### Culverts

25 Culverts including Hume Pipe, Slab, and Arch Culverts are designed along the project road.

**National Highways Authority of India (NHAI)**

**Place: Bareilly**

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(Amit Ranjan Chitranshi)  
Project Director, Bareilly

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