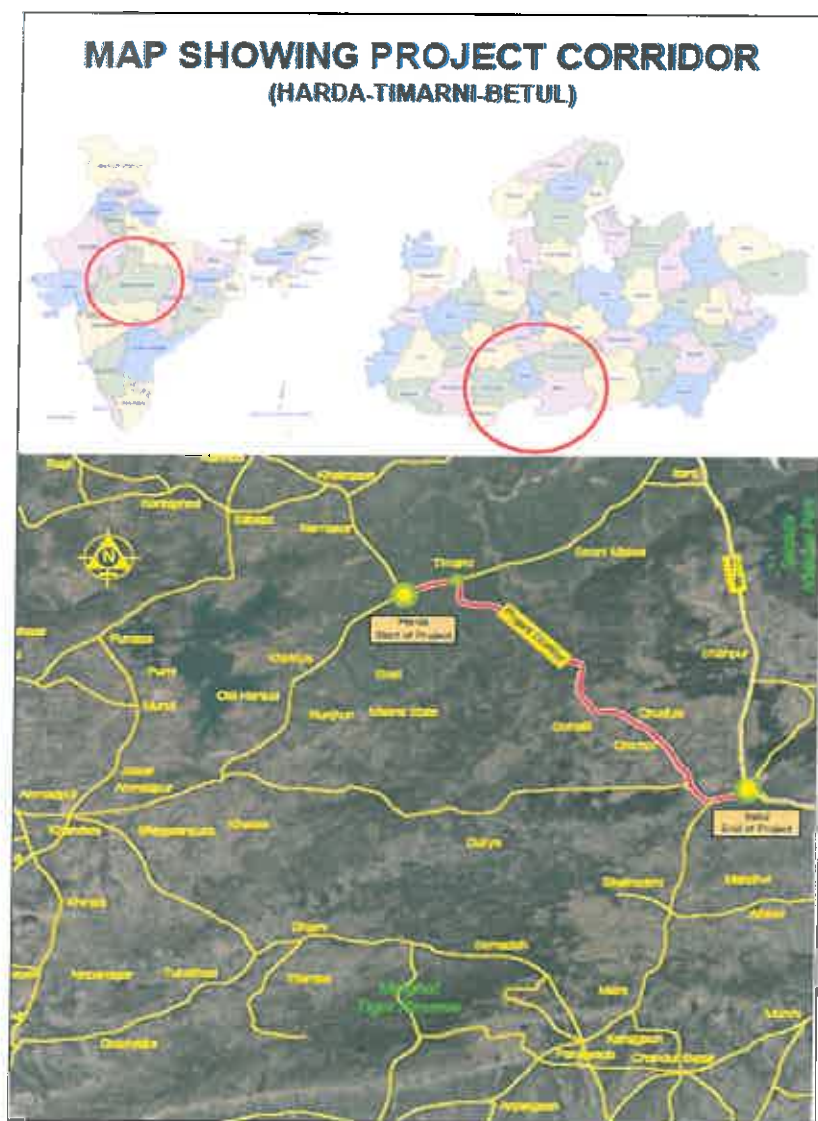


Modified Alignment Report

National Highways Authority of India (NHAI) under the Ministry of Road Transport & Highways (MoRT&H), Government of India has been entrusted with the Development of Economic Corridors, Inter-Corridors, Feeder Routes and Coastal Road primarily to improve the freight movement in the Country. In pursuance of the above, LEA Associates South Asia Private Limited have been appointed as Consultants by NHAI to carry out the "Preparation of Detailed Project Report for Development of Economic Corridors, Inter-Corridors, Feeder Routes and Coastal Road primarily to improve the freight movement in the Country (Lot-1/Madhya Pradesh/Package-1).

The project roads are shown in the following figure



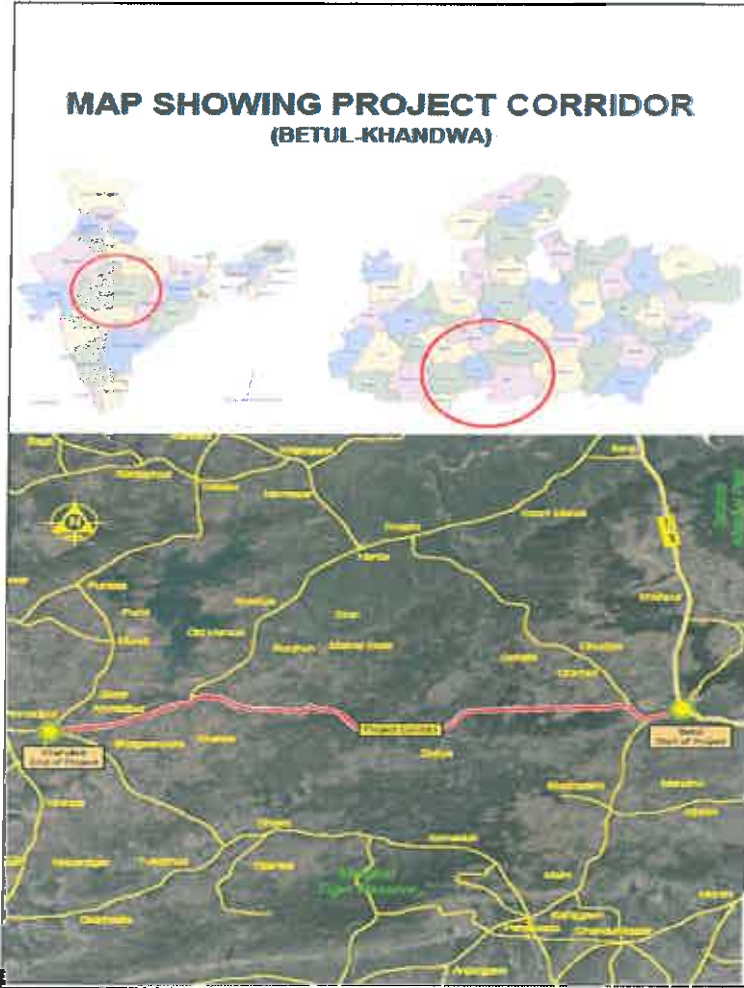
Harda-Betul section of NH-47

A. Harda-Timurni- Betul Section

The Proposed project road is a part of NH-47, traverses through the two districts of Madhya Pradesh, north to south direction, namely Harda and Betul. It starts from the Km.140+000 of NH-47 at Harda urban area. After travelling almost 121.248km project ends at the interchange for Bhopal & Nagpur which is very near to Betul. The starting and ending chainage with GPS co-ordinate and locations are presented in a tabular form below.

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Start Chainage(Km)	End Chainage (Km)	GPS Co-Ordinate (UTM)	
		Start Point	End Point
Ex 140+000(Design Ch 0+000) of NH-47 at Harda.	Ex 275+000 (Design Ch 121+248) of NH-47 at the interchange for Bhopal & Nagpur, just before Betul	43 Q, 712493.00 m E, 2477208.00 m N	43Q, 797498.00 m E, 2422829.00 m N



Betul-Khandwa section of NH-347B/SH-26


Project Director
NHAI, PIU Chhindwara (M.P.)

B. Betul-Khandwa Section

The project road is a part of NH-347B/SH-26, traverses through the two districts of Madhya Pradesh, East to West direction, namely Betul and Khandwa. It starts from the Junction of NH-47 and NH-347B/SH-26 and ends before the Khandwa Town just after the Power GRID. The starting and ending chainage with GPS co-ordinate and photographs are presented in a tabular form below.

Start Chainage (Km)	End Chainage (Km)	GPS Co-Ordinate (UTM)	
		Start Point	End Point
Ex Ch 0+000(Design Ch 0+000) at the junction of NH-347B/SH-26 & NH-47	Ex Ch 5+300 (Design Ch 153+830) ends before the Khandwa Town (just after the Power GRID)	43Q, 783790.00 m E, 2424383.00 m N	43 Q, 644558.00 m E, 2414634.00 m N

The proposed Harda-Betul section is a part of Indore – Nagpur Economic corridor whereas Betul-Khandwa section is a feeder route to this Indore-Nagpur Economic corridor. It has been planned to prepare Detail Project Report of the above mentioned two stretches under Bharatmala Scheme as LOT-1/ Madhya Pradesh/Package-I.

The identification of the route alignment of this economic corridor including feeder route was initially taken up in the early 2015 by the Ministry of Road Transport & Highways (MoRT&H) under Logistics Efficiency Enhancement Programme (LEEP) scheme. The alignment was Identified and submitted by M/s AT Kearney in his LEEP Final Report. Based on this alignment M/s NHAI has launched a scheme under Bharatmal to prepare detailed project report for development of Economic Corridors, Feeder routes, inter corridors throughout India to enhance the efficiency freight transportation.

In the current consultancy assignment, the Consultant was asked to identify the most techno economically feasible alignment to connect the already identified corridor. It was however stipulated that the consultant might review the alignment based on existing conditions at site and possibility of develop the existing route as access controlled corridor if it passes through problematic area and propose alternate solutions wherever it is necessary.

Project Director
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Harda-Betul Road:

Package 1(km 0.000 to km 31.200) -Length=31.200km

Package 2(km 31.200 to km 82.160)- -Length=50.960km

Break Chainage in between Pkg 2,3

Package 3(km 81.000 to km 121.248) -Length=40.248km



Project Director
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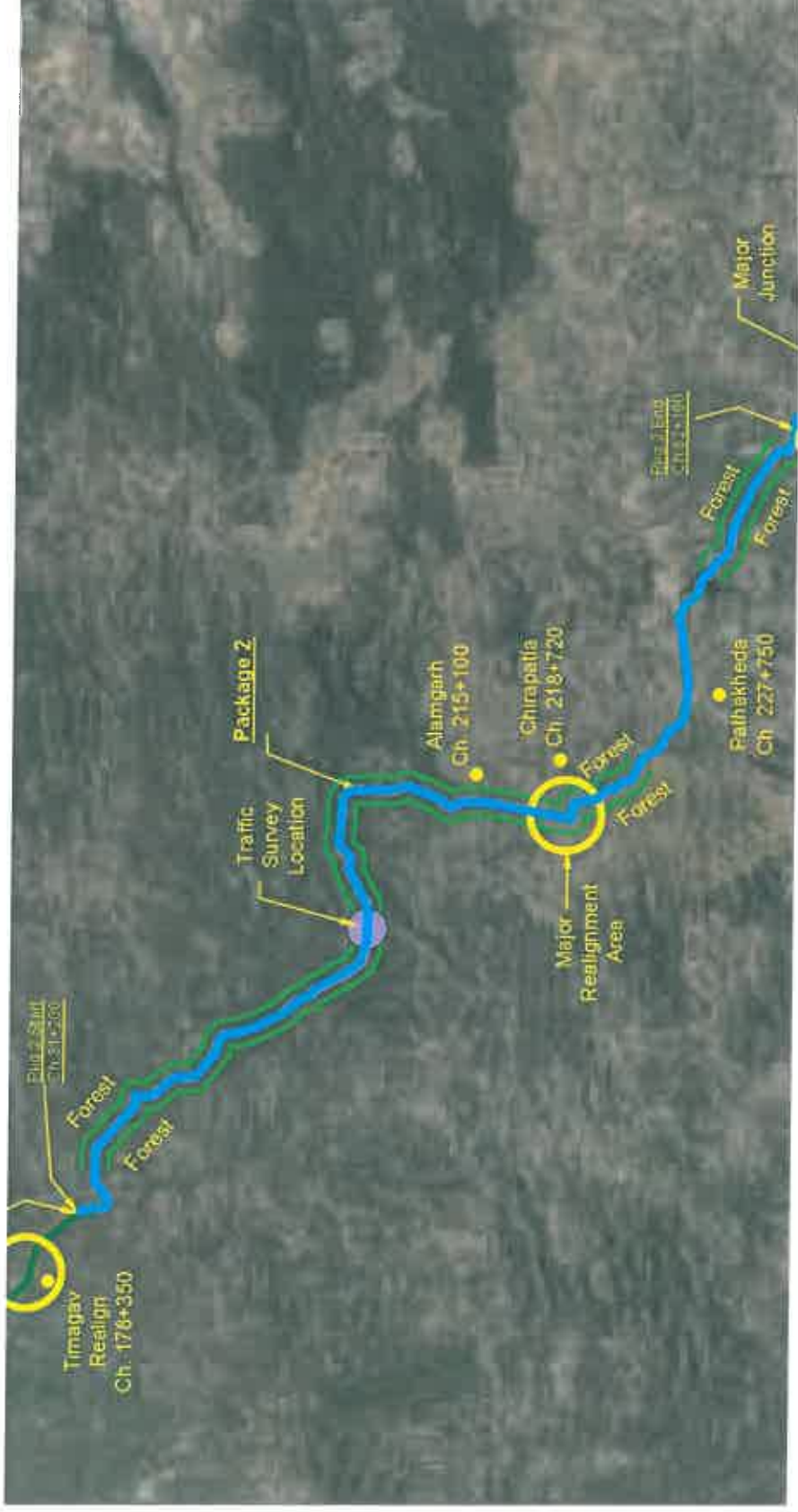
Harda Betul Packaging Details



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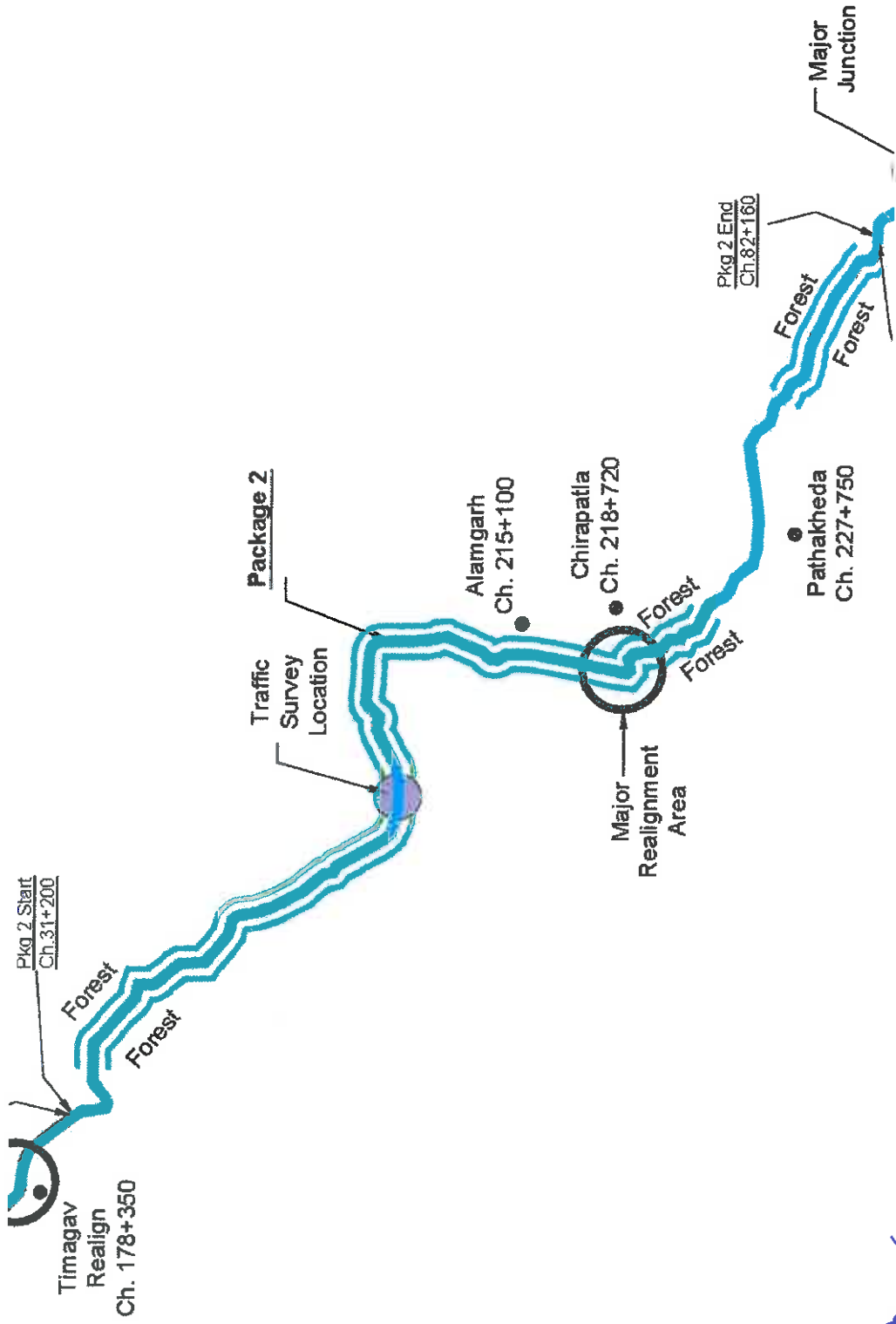
NHAI Project Director
NHAI, PIU Chhindwara (M.P.)

Harda Betul Package 2



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Harda-Betul Road: Package 2 (km 31.200 to km 82.160)

Ex. Length: km 180.000 to km 235.800-Length=55.800 km

Design Length: km 31.200 to km 82.160-Length=50.960 km

Minimum Horizontal Radius:100m

Minimum Vertical curve length: 20.43m

Minimum K value(Sag): 16

Minimum k Value(Hog): 25

Max. Super Elevation: 7%

Structure Details

Project Road	
Project road length	50.960 km
Connectivity	Harda-betul Package 2
On national Highway	NH-47
Proposed Features	Proposed
Major Bridges	1
Minor bridges	22
ROB	0
Culverts	94
VUP/VOP/PUP	2
Flyover	0

Design Speed details

Harda-Betul Road				
Sl.No	Design Speed(Kmph)	Length(km)	Percentage	Remarks
1	100	31.5	61.81%	Plain terrain
2	80	7.46	14.64%	Rolling-Hilly Terrain
3	60	9.8	19.23%	Hilly Terrain
4	50	2.2	4.32%	Hilly Terrain

Forest Details: Nil

Sl.No	Chainage details	Length(km)	Percentage
1	31.200 to 82.160	31.200	61.22%


Project Director
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Widening Scheme Summary

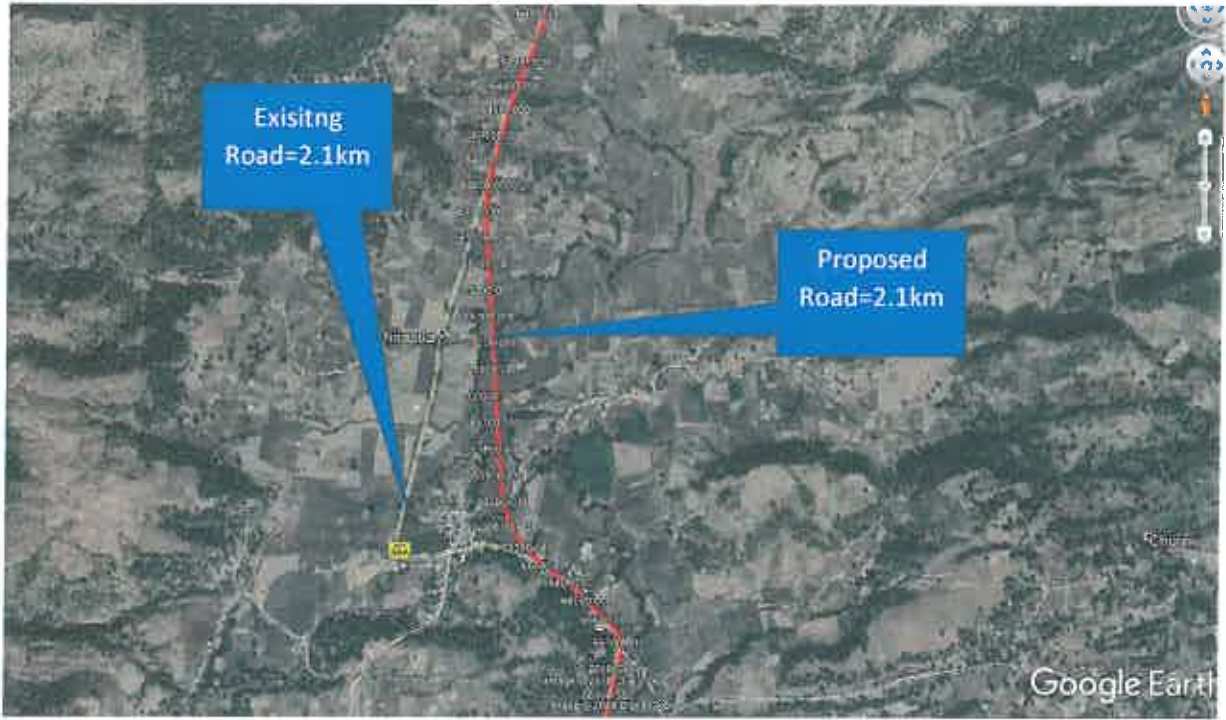
Name of the National Highway	Widening length in Km			Bypasses & Realignments (Km)
	Concentric	Left Side	Right Side	
NH-47	3.700	11.550	9.590	26.120

Sl.No	Design Ch		PROW	Speed
	From	To		
1	31200	54640	30	60-80-100
2	54640	55000	30	60
3	55000	55480	60	50
4	55480	55850	30	50
5	55850	59670	60	50-60
6	59670	59930	30	60
7	59930	60330	60	60
8	60330	60900	30	60
9	60900	65190	60	100
10	65190	65250	30	50
11	65250	65370	60	100
12	65370	65500	30	100
13	65500	77080	60	100
14	77080	77340	30	100
15	77340	78900	60	100
16	78900	79200	30	100
17	79200	82160	60	60

(Handwritten Signature)

**Project Director
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Realignment:



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**Project Director
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