

Chapter -1

Executive Summary

1.1. Introduction

National Highways Authority of India (NHAI) has been entrusted preparation of Final Feasibility Study Report of selected stretches/corridor of Atal Progress way for four lanning with paved shoulder configuration.

The Final Feasibility Study Report thus prepared shall contain the scheme and layout of the development of the Expressway and the project facilities, preliminary design, costing and financial viability based on present and future traffic. The Final Feasibility Study Report would thus provide all technical details. In order to fulfil the traffic needs and road safety requirement, NHAI has appointed the L. N. Malviya Infra Projects Pvt. Ltd., Bhopal (M.P.) as consultants to Providing Consultancy Services for Preparation of Final Feasibility Study Report of Atal Progress way in the State of Madhya Pradesh for Green Field alignment.

1.2. Objectives

- The main objective of the consultancy is to establish the technical, economic and financial viability of the project and prepare Detailed Project Report for design of green field expressway.
- The viability of the project shall be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on expressway design, pavement design, provision of services roads wherever necessary, type of intersections and construction of new bridges and structures, road safety features, quantities of various items of work, cost estimates and economic analysis.
- The Detailed Project Report would inter-alia include detailed highway design, design of pavement and overlay with options for flexible or rigid pavements, design of bridges and cross drainage structures and grade separated structures, design of service roads, quantities of various items, detailed working drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for intonations/ local competitive bidding.
- The detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation.

1.3. Scope of Study

The project study consists of preparation of the following:

- Stage 1 – Inception Report
- Stage 2 – Alignment Plan Report
- Stage 3 – Detail of Land Plan
- Stage 4 – Environmental & Social Impact Assessment Report
- Stage 5 – Draft Feasibility Study Report
- Stage 6 – Final Feasibility Study Report

1.4. Scope of services

- The Scope of Services, inter-alia, covers the following main activities:
- Review of all available reports and published information about the project road and the project influence area;
- Environmental and social impact assessment, including such as related to cultural properties, natural habitats, involuntary resettlement etc.;
- Public consultation, including consultation with communities located along the road, NGOs working in that area, other stake-holders and relevant Govt. departments at all the different stages of assignment;
- Detailed reconnaissance;
- Identification of possible improvements in the existing alignment and bypassing congested locations with alternatives, if required, evaluation of different alternatives comparison on techno-economic and other considerations and recommendations regarding most appropriate option;
- Traffic studies including traffic surveys and Axle load survey and demand forecasting for next thirty years;
- Inventory and conditions surveys for road and pavement;
- Inventory and conditions surveys for bridges, cross-drainage structures and existing drainage provisions;
- Detailed topographic surveys using Total Station and GPS;
- Pavement Investigations;
- Sub-grade characteristics and strength investigation of required sub-grade and sub-soil characteristics and strength for road and embankment design and sub soil investigation;
- Identification of sources of construction materials;
- Detailed design of structures, preparation of GAD and construction drawings and cross-drainage structures and underpasses etc.
- Identification of the type and the design of intersections;
- Design of complete drainage system and disposal point for storm water;
- Value analysis/ Value engineering and project costing;
- Strip plan indicating the scheme for carriageway widening, location of all existing utility services (both over-and underground) and the scheme for their relocation, trees to be felled and planted and land acquisition requirements including schedule for Land Acquisition; report, documents and drawings, arrangement of estimates for cutting of trees and shifting of utilities;
- Preparation of detailed project report, cost estimate, approved for construction drawings, rate analysis, detailed bill of quantities, bid documents for execution of civil works through budgeting resources;
- Design of toll plaza and identification of their numbers and locations and office cum residential complex including working drawings;
- Design of weighing stations, parking areas and rest areas.
- Any other user oriented facility en-route toll facility.
- Preparation of Social plans for the project affected period as per policy of the lending agencies/ Government of India R & R Policy.

1.5. Socio - Economic Profile

The Atal Progress way is located in the district of Sheopur, Morena and Bhind which in turn is located in the State of Madhya Pradesh. Madhya Pradesh is the second largest state in terms of geographic extent, covering an area of 308,244 sq. km. The state is administratively divided into 52 districts. As per 2011 census, Madhya Pradesh has a population of 72 million accounting to 6 per cent of India's population. State population has grown at 20.3 per cent between 2001- 2011. Population density of the state is 236 persons per square kilometre and is significantly lower than the national average of 382 persons per square kilometre. Further, distribution of population among the districts is uneven with 21 districts registering population density of less than 200 persons per square kilometre resulting in regions with relatively higher and lower human capital availability.

Majority of the state (around 72 per cent) population still lives in rural areas. However, there has been a steady growth in urbanization, with the emergence of industrial clusters in the districts of Indore, Bhopal, Jabalpur and Gwalior as destinations for intra state migration.

Sheopur Censes	
Description	2011
Population	6.88
Actual Population	687861
Male	361784
Female	326077
Population Growth	22.94%
Area Sq. Km	6.606
Density/km2	104
Proportion to Madhya Pradesh Population	0.95%
Sex Ratio (Per 1000)	901
Child Sex Ratio (0-6 Age)	897
Average Literacy	57.43
Male Literacy	69.33
Female Literacy	44.23

Bhind Censes	
Description	2011
Population	17.03
Actual Population	1703005
Male	926843
Female	776162
Population Growth	19.21%
Area Sq. Km	4459
Density/km2	382
Proportion to Madhya Pradesh Population	2.34%
Sex Ratio (Per 1000)	837
Child Sex Ratio (0-6 Age)	843
Average Literacy	75.26
Male Literacy	85.40
Female Literacy	63.14

Morena Censes	
Description	2011
Population	19.66
Actual Population	1965970
Male	1068417
Female	897553
Population Growth	23.44%
Area Sq. Km	4989
Density/km2	394
Proportion to Madhya Pradesh Population	2.71%
Sex Ratio (Per 1000)	840
Child Sex Ratio (0-6 Age)	829
Average Literacy	71.03
Male Literacy	82.93
Female Literacy	56.90

Industries in Gwalior

There are many major industries are located in Gwalior named as Trident Group of Industries, Bharat Heavy Electricals, Procter and Gamble, Nestle, Hindustan Petroleum, Cummins, Aditya Birla Group, Tata Motors, Mahindra Motors etc. The project corridor should be provided direct connectivity between the Gwalior to the Rajasthan and Uttar Pradesh.

Nearby Tourist Place Gwalior

At Chainage 266+400km project alignment intersect with NH-44 which is also named as Agra-Mumbai Road (A-B Road) which connects the project corridor to Gwalior industrial and tourist place. Gwalior One of the most beautiful cities of Madhya Pradesh in India, Gwalior is very famous for its marvellous palaces, old temples and the medieval fort. Being the birthplace of the great musician Tansen, the city is also highlighted for its majestic history and rich cultural heritage.

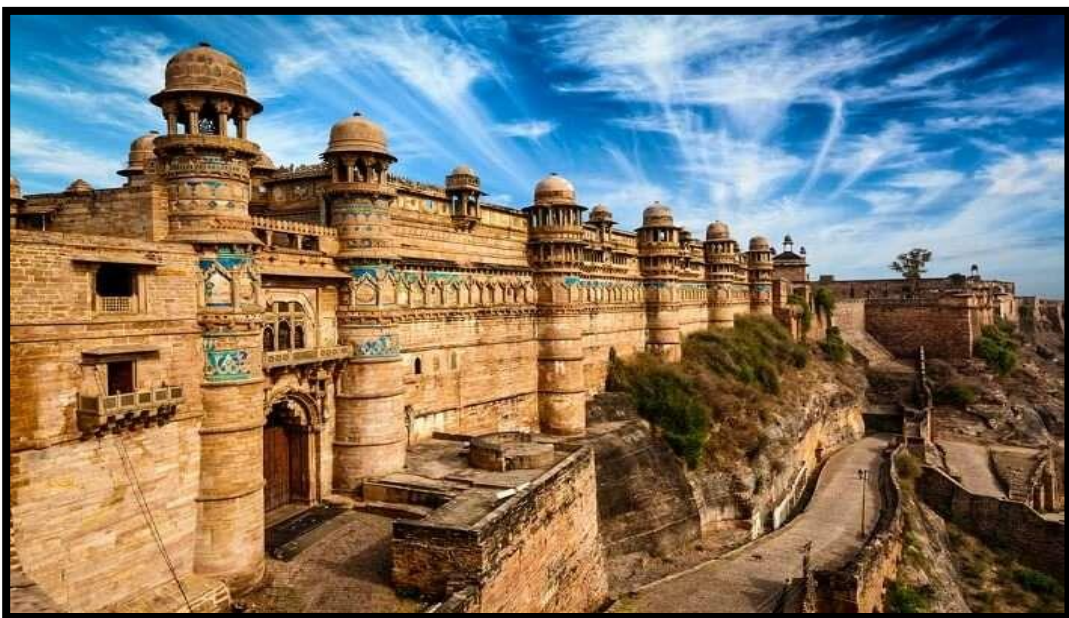


Photo: Gwalior Fort

Nearby Tourist Place Agra

At Chainage 266+400km project alignment intersect with NH-44 which is also named as Agra-Mumbai Road (A-B Road) which connects the project corridor to Agra industrial and tourist place. Agra is best known for the Taj Mahal (17th century), designated a UNESCO World Heritage site in 1983. A complex mausoleum, the Taj Mahal is often considered to be the world's best example of Mughal architecture.



Photo: Taj Mahal

Industries in Agra

There are many major industries are located in Agra named as Agra Oil & General Industries Ltd, National Metal and general Industries, JK Tyre and Industrial Limited, National Steel and Agro Industries Limited Agra, Koshal Industries in Agra, Exide Industries Limited, Navbharat Industries, Hanumant Packaging Industries, Rajendera Industries, Paradise Industrial Corporation and JK Cottage Industries etc.

1.6. Project Alignment Detail in Madhya Pradesh

INDEX MAP

Project alignment Atal Progress way

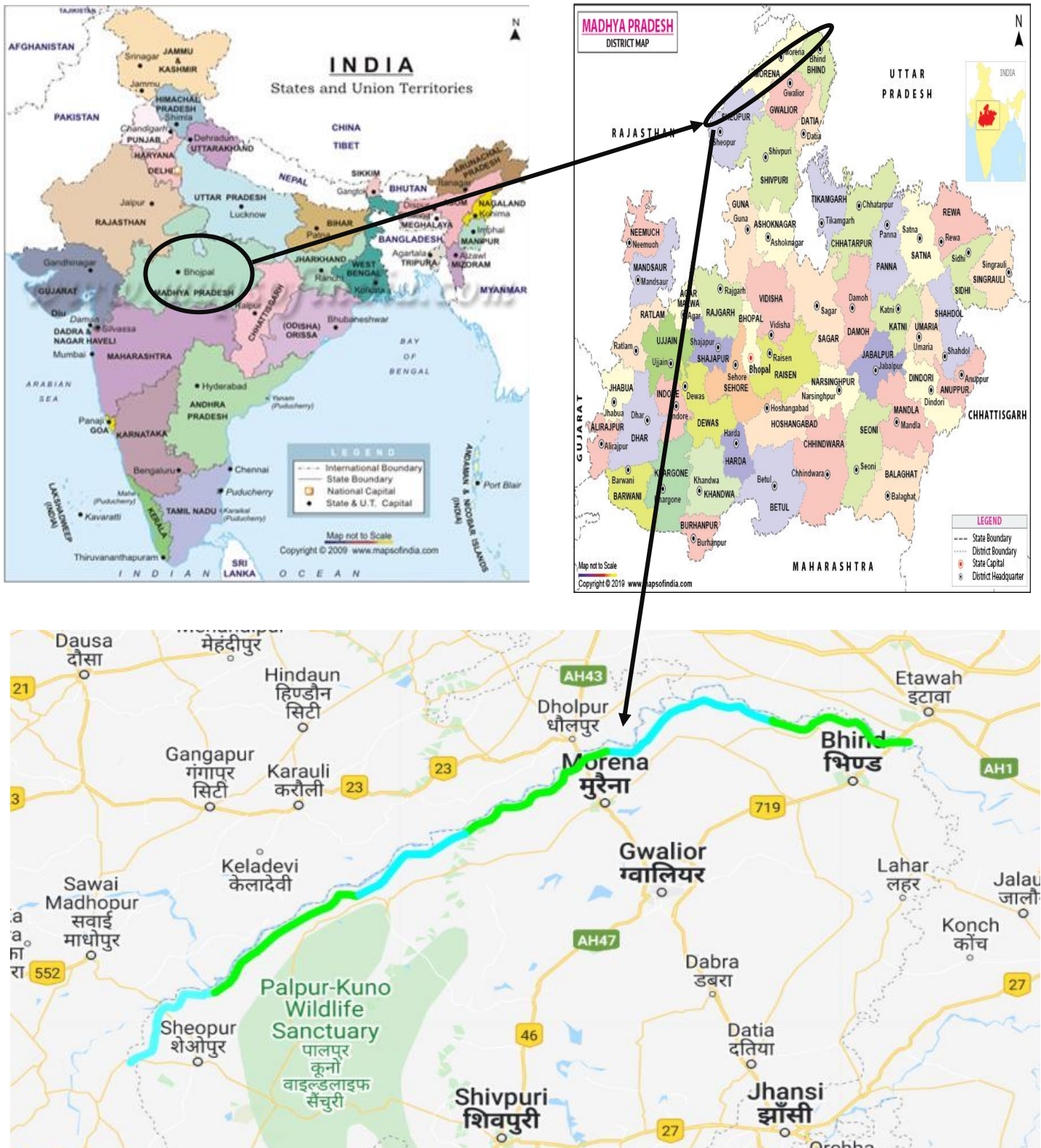


Table: Construction Packages Detail

S. No.	Package	State	District	Chainage		Length (Km)
				From	To	
1	Package-2	Madhya Pradesh	Sheopur	72+000	115+100	44+455
2	Package-3	Madhya Pradesh	Sheopur	115+100	175+400	60+300
3	Package-4	Madhya Pradesh	Morena	175+400	217+000	41+600
4	Package-5	Madhya Pradesh	Morena	217+000	273+850	56+850
5	Package-6	Madhya Pradesh	Morena	273+850	335+900	62+050
6	Package-7	Madhya Pradesh	Bhind	335+900	384+450	48+550

1.7. Project Description

The Project Corridor runs through Sheopur - Morena - Bhind district is a Green Field Atal Progress way and Length of the Project Corridor is 312+450 Kms (in Madhya Pradesh).

➤ Start point of the project road in Madhya Pradesh:

The proposed Project Corridor starts at near Pali village, Sheopur District, Latitude & Longitude (25°40'11.27"N & 76°28'52.39"E).



Photo -: Starting Point of Project Road

➤ End point of the project road in Madhya Pradesh:

The proposed Road Terminates at near Barhi village, NH-719 Etawah-Gwalior Road, of Latitude & Longitude (26°41'18.50"N & 78°57'47.83"E).



Photo -: End point of the project road

1.8. Road Junctions

The project is passes through Barren land and various villages. Project road encountered with 1 Major junction at Ch. 266+420km and which is passes through NH-44 Agra Bombay road.



Photo: NH-44 Agra Bombay Road

1.9. Proposed Bridge & Cross Drainage Structures

Table: - Summary of Proposed Bridges and CD

Type of Structure	Major Bridges	Minor Bridges	Culvert	LVUP	ROB	Flyover	VUP	SVUP
Proposed Structures	8	67	455	16	2	10	10	88

1.10. Railway line crossing

In this alignment Railway crossing at chainage 267+300 near Bhanpur village adjacent to NH-3 (Morena Dholpur road) and another crossing is at chainage 380+000 near Barhi village adjacent to NH-92 (Bhind Etawah road).

Table: - List of Proposed Level Crossing

S. No.	Existing Chainage (Km)	Type of line	Nearest Village	Nearest Railway Station	
				L.H.S.	R.H.S.
1	267+300	Broad Gauge	Bhanpur Village	Dholpur Railway Station 18 km in Left hand side of project corridor	Hetampur Railway Station 3 km in Right hand side of project corridor
2	380+000	Broad Gauge	Barhi Village	Udi Morh Railway Station in 6 Km Left hand side of project corridor	Bhind Railway Station in 18 km Right hand side of project corridor

1.11. Improvement Proposals

The improvement proposals for proposed widening include the provisions for the following major items:

- Proposed Pavement Design
- Traffic Control and Safety Measures

The geometric design of junctions is based on IRC: SP 84: Guidelines for the Design of at grade Intersections in Rural & Urban Areas. The design and detailing of all intersections are based on the type designs as outlined in the document titled, Type Designs for Intersections on National Expressways. Prepared by the MoRT&H New Delhi 1995.

1.12. Pavement Design

Pavement composition for main carriageway

Pavement composition in mm	
BC	40
DBM	90
WMM	100
CTB	100
CTSB	200
MSA	250 MSA
CBR	8%

Pavement composition for service road

Pavement composition in mm	
BC	40
DBM	
WMM	150
CTSB	200
MSA	50 MSA
CBR	8%

1.13. Way side Amenities

LCV Parking, Petrol pump, Cafe area, Toilet, Electric Vehicle Charging Station, Kids Play area, Dormitory for Drivers the positions shall be finalized as per traffic and city nearby National Highway and State Highway planned along the project corridor.

Table: Way side Amenities Location

Location	
PKG-2	102+100 km
PKG-3	148+650 km
PKG-4	184+000 km
PKG-5	254+400 km
PKG-6	325+000 km
PKG-7	365+550 km

1.14. Road Marking & Traffic Signs

Appropriate road markings are provided with stop signs, give-way signs, traffic merging and diverging signs, lane closure signs, compulsory keep left/right signs or any other signs as per IRC-67. Advance cautionary signs are proposed for sharp curves along with chevron signs at the outer edge of the curves with appropriate delineators.

1.15. Land use Pattern

The Project alignment Atal Progress way passes through agriculture, forest, built up and barren land.

1.16. Right of way (ROW)

The project corridor of Expressway for 4 lane green field alignment land should be acquired as 100m.

1.17. Terrain

The terrain is plain at most of the stretch and has normal gradient throughout the Plain terrain & in forest area rolling terrain are present.

1.18. Forest

Project corridor passes through forest area. Tentative forest area affected 264.04 Ha. Details of affected forest area are tabulated below:-

Table: Forest area in Bhind District

Forest Area Details of Bhind District in Madhya Pradesh Portion							
S. No.	Forest Division	Forest Range	Village	Forest Compartment No.	Status of Forest	Forest Area (In Ha.)	
1	Bhind	Ater	Arjunpura	89	PF	7.97	14.69
2			Kherahat	17		11.30	
3						3.00	
4						0.39	
5			Kadora	16	RF	13.00	
6			Ghinochi	15		3.94	
7			Repura	6		8.14	
8			Bindwa	7	PF	4.27	8.47
9						4.20	
10						Jamsara	2
11			Koshad	8		RF	4.24
13				9	1.74		
14					6.29		
15			1.69				
16			Bijora	10	PF	5.37	16.34
17			Chilong	11		4.14	
18						12.20	
19						0.15	13.95
20			Pariyaya, Rama	12	13.80		
21			JoriAhir	22	RF	1.10	
22			Gada, Chachar, Baderi	23	PF	28.5	
23			Badapura	27		0.16	
24			Barhi	43	RF	3.41	8.55

25						5.14	
26				44		10.60	
Bhind Forest Division (Area in Ha.)						177.24	

Table: Forest area in Morena District

Forest Area Details of Morena District in Madhya Pradesh Portion									
S. No.	Forest Division	Forest Range	Name of Village	Forest Compartment No.	Status of Forest	Forest Area (In Ha.)			
1	Morena	Joura	Bhindwad Devgarh	Revenue Forest	Revenue Forest	0.994	8.944		
2						7.95			
3			Nandpura			Revenue Forest	Revenue Forest	3.93	22.94876
4								0.00876	
5								5.81	
6								13.20	
7			Gudha Chambal			Revenue Forest	Revenue Forest	12.1	36.4500
8								13.3	
9								3.19	
10				7.86					
11			Khandoli	37	RF	17.20	19.78		
12						0.81			
13						1.77			
14						36	5.10		
15						35	17.20		
16			Joura Range Total Area					110.42	
17	Morena	Morena	Kaithri	12	RF	12.40	5.83		
18				Kaitheri Part-1	Revenue Forest	1.260			
19				Kaitheri Part-2		0.169			
20				Kaitheri Part-3		4.400			
21			Masoodpur	Masoodpur Part- 1	Revenue Forest	1.351	1.63		
22				Masoodpur Part- 2		0.280			
23				11		RF	2.90		
24			Khairta	6 (With Khasra 550)	23.50				
25			Rached	3	15.00				
26			Morena Range Total Area					61.260	
27	Morena	Sabalgarh	Atar	DRDO Atar Patch- 1	Unclassified Forest Area	7.78			
28			Digwar	Digwar Patch- 2		15.50			
29				DRDO Moja Digwar Patch- 1		6.33			

30			Khera Digwar	P- 333		0.00792	
31				P- 334		1.31	
32				New Khera Digwar		0.0373	
33			Rahugaon	Rahugaon	1.38		
34					4.10		
35			Sabalgarh Range Total Area				36.45
Morena Forest Division (Area in Ha.)						208.12798	

Table: Forest area in Sheopur District

Forest Area Details of Sheopur District in Madhya Pradesh Portion						
S. No.	Forest Division	Forest Range	Village	Forest Compartment No.	Status of Forest	Revised Area (In Ha.)
1	Sheopur	Budhera	Manpur	534	RF	18.30
Sheopur Forest Division (Area in Ha.)						18.30

Atal Progressway Forest Area Details		
S. No.	District	Forest Area (In Ha.)
1	Sheopur	18.30
2	Morena	208.12798
3	Bhind	177.24
Total Area		403.66798

1.19. Land Details

Government Land

S. No.	District	Affected Land (Ha.)	Transferred to NHAI (Ha.)	Mutation/ Updation of Revenue record
1	Sheopur (96 K.M.)	348	348	The process of mutation/ updation of revenue record is underway.
2	Morena (169 K.M.)	1043.413	1043.413	
3	Bhind (48 K.M.)	229	229	
Total		1620.413	1620.413	

Private Land

S. No.	District	Affected Land	Affected Farmer		*Consent	
			No.	Area (Ha.)	No.	Area (Ha.)
1	Sheopur (96 K.M.)	609	1774	609	-	-
2	Morena (169 K.M.)	455.096	5099	453	3510	283
3	Bhind (48 K.M.)	114	1613	114	238	20.99
Total		1178.096	8486	1176	3748	303.99

Total land affected

S. No.	District	Status of 3A						Expected date of 3D uploading
		Government			Private			
		Area	Date	Bal.	Area	Date	Bal.	
1	Sheopur (96K.M.)	348	08.04.2022	Nil	609	08.04.2022	Nil	15.05.2022
2	Morena (169K.M.)	1043.413	08.04.2022	Nil	455.096	08.04.2022	Nil	15.05.2022
3	Bhind (48 K.M.)	229	08.04.2022	Nil	114	08.04.2022	Nil	15.05.2022
Total		1620.413			1178.096			

1.20. Toll Plaza

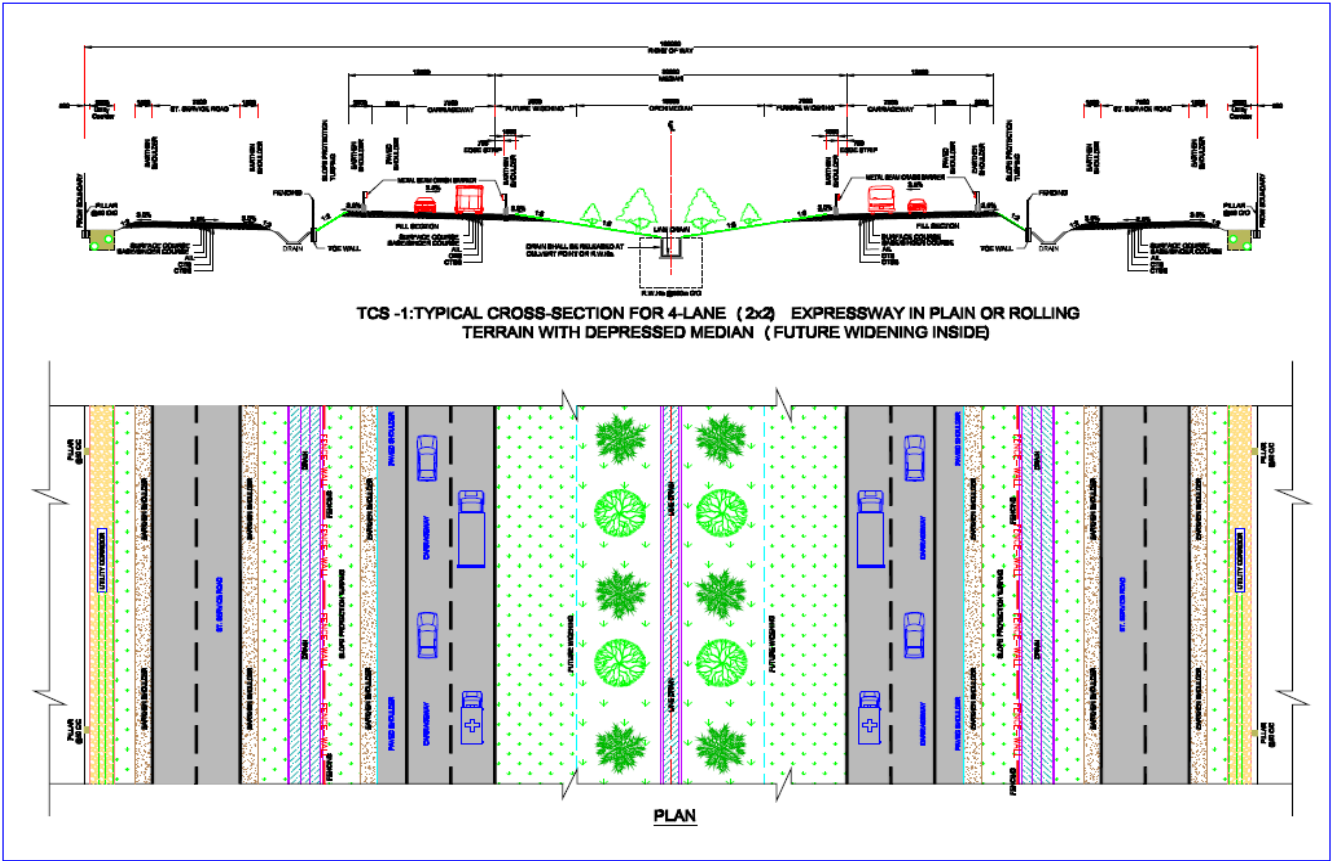
Toll plaza are provide at Intersection of the project corridor.

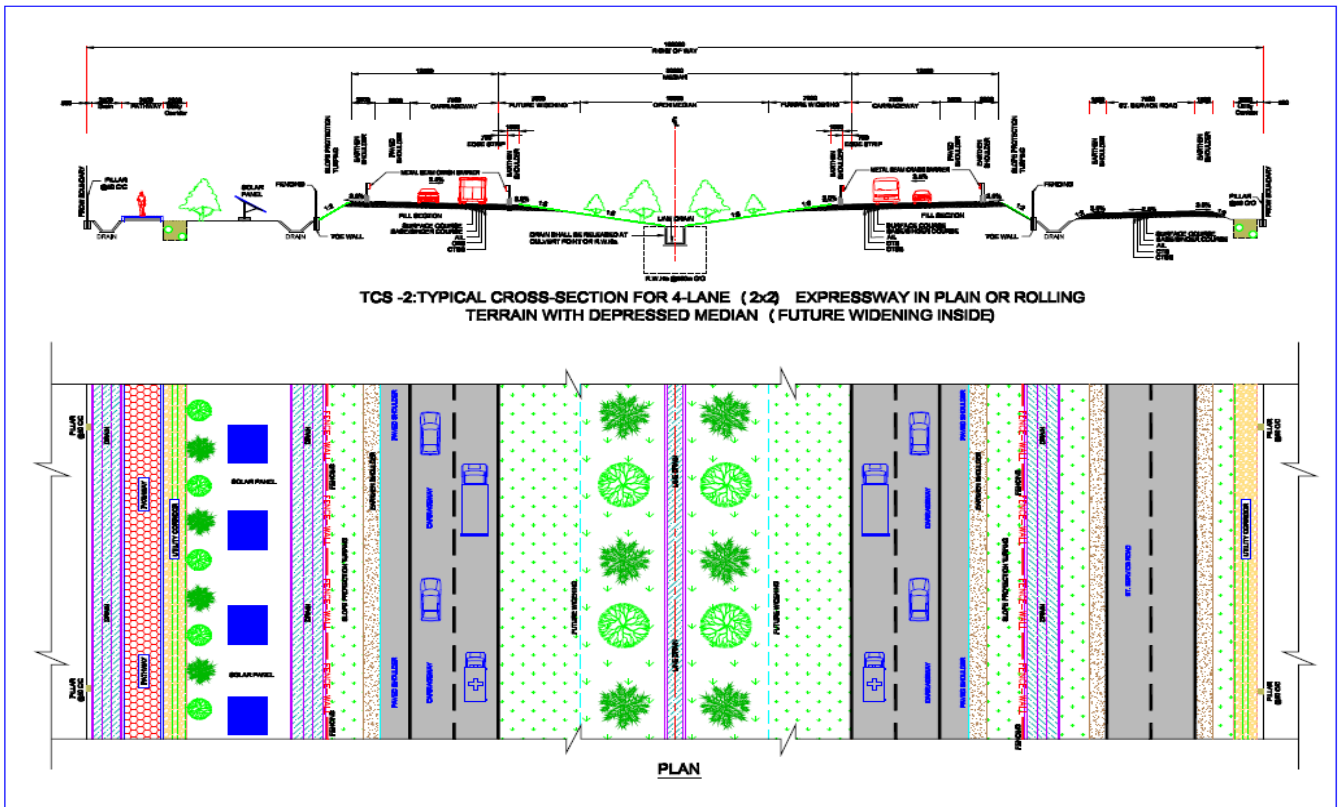
1.21. Utilities

Utilities field survey is going on the data should be provided as soon.

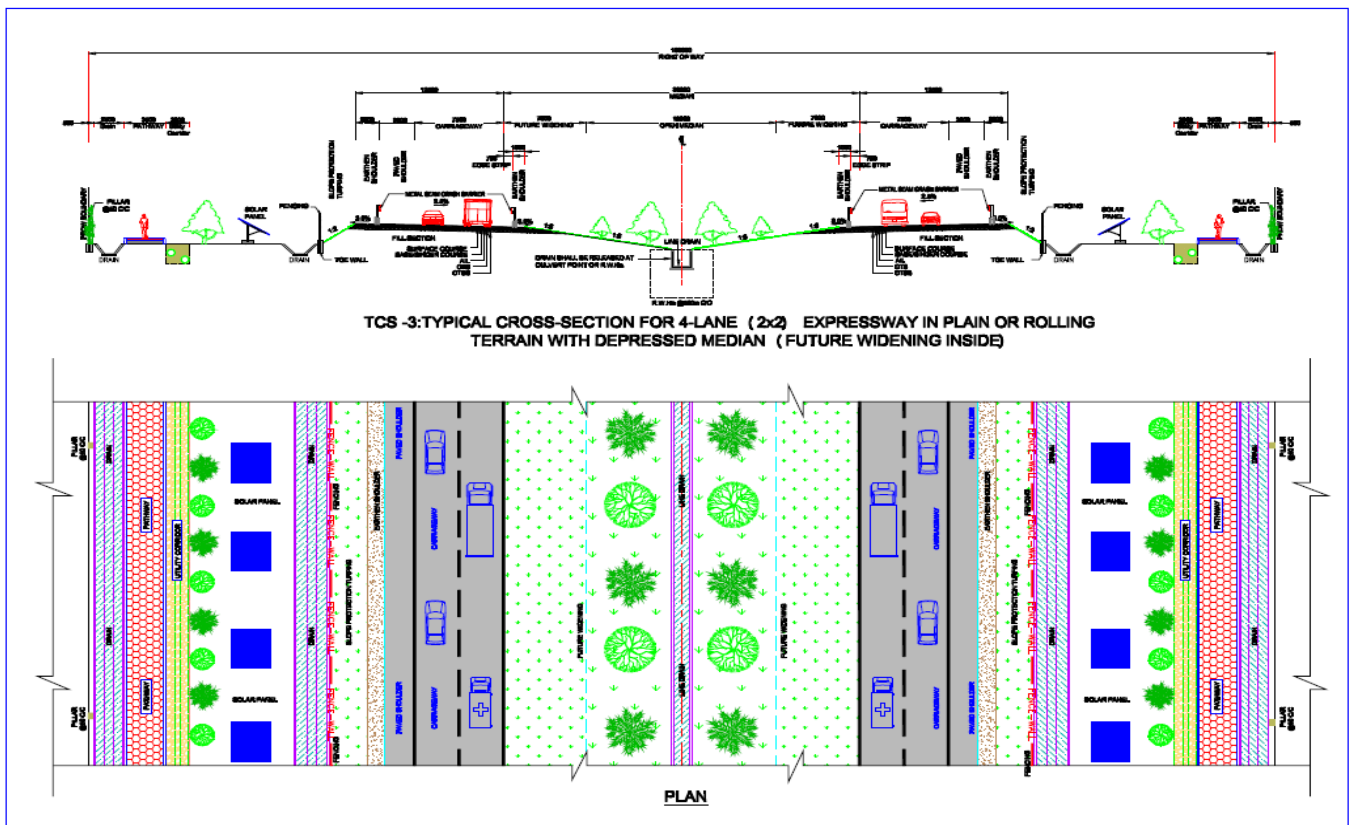
1.22. Typical Cross Section

TCS-I





TCS-III



1.23. Cost Estimate



NATIONAL HIGHWAYS AUTHORITY OF INDIA
(Ministry of Road Transport and Highways)
Government of India

**PREPARATION OF DPR / FEASIBILITY REPORT FOR ATAL PROGRESSWAY (CHAMBAL EXPRESSWAY) IN
STATE OF RAJASTHAN, MADHYA PRADESH AND UTTAR PRADESH
(PKG-2 Total Length- 44.47 Km)**

GENERAL ABSTRACT OF COST (PKG-2 Km 70+635 to Km 115+100)

		44.47	
S No.	Description	Amount (Rs.)	Amount (Cr.)
1	Bill No. 1 & 2: Site clearance and Dismantling	99,26,808.40	0.99
2	Bill No. 3 : Earth work, Erosion Control and Drainage	1,85,26,02,574.45	185.26
3	Bill No. 4 : Sub Bases, Bases (Non Bituminous) and Shoulder	86,61,97,785.23	86.62
4	Bill No. 5 : Bases and Surface Courses (Bituminous)	1,04,28,85,562.10	104.29
5	Bill No. 6A : Box Culverts	80,55,70,801.00	80.56
6	Bill No. 6B : Minor Bridges	56,57,52,501.41	56.58
7	Bil No. 6C : Major Bridges	1,22,88,19,076.25	122.88
8	Bill No. 6D : VUP/LVUP/PUP	34,38,36,782.00	34.38
9	Bill No. 6E : ROB	0.00	0.00
10	Bill No. 6F : Flyover	57,52,37,892.34	57.52
11	Bill No. 6G : Interchange	11,97,97,563.72	11.98
12	Bill No. 8 : Traffic signs, Road markings and other road appurtunences	1,04,56,34,562.00	104.56
13	Bill No. 9 : Horticulture	4,66,35,003.00	4.66
14	Bill No. 10 : River Training and Protection works	94,33,41,018.08	94.33
15	Bill No. 11 : Drainage Work	1,07,58,48,131.77	107.58

16	Bill No. 12 : Slip Road	0.00	0.00
17	Bill No. 13 : Toll Plaza	0.00	0.00
18	Bill No. 14 : Wayside Amenities	10,00,00,000.00	10.00
19	Bill No. 15 : Truck Lay & Bus Bay	3,01,54,319.26	3.02
20	Bill No. 16 : Rain water Harvesting	16,80,793.80	0.17
21	ATMS for Access Controlled Expressway,	12,48,26,845.19	12.48
22	Utility Cost	1,06,63,421.97	1.07
A	Civil Cost	10,78,94,11,441.96	1,078.94
	Cost in crores	1078.94	
	Civil Cost per km (Project length, L = 45.365 Km)	24.26	
B	GST 12% on A	1,29,47,29,373.03	129.47
	Civil Cost with GST 12% (A+B)	12,08,41,40,814.99	1,208.41
	Contingencies @ 1% on "A"	10,78,94,114.42	10.79
	Construction Supervision Charges @ 3% on "A"	32,36,82,343.26	32.37
	Agency Charges @ 3% on "A"	32,36,82,343.26	32.37
C	CENTAGES	75,52,58,801.00	75.53
	TOTAL COST Including CENTAGES (A+B+C)	12,83,93,99,615.99	1,283.94
D	Maintenance Cost for 10 years @ 5 % on "(A+B)"	60,42,07,040.75	60.42
E	Provision for Price Adjustment for @ 5 % on "(A+B)"	0.00	0.00
	Total Construction Cost (A+B+C+D+E)	13,44,36,06,656.74	1,344.36
F	Environment Cost	4,44,650.00	0.04
G	Forest Clearance Cost	2,74,39,270.00	2.74
	TOTAL PROJECT COST (A+B+C+D+E+F+G)	13,47,14,90,576.74	1,347.15

The Cost of Construction per Km is 30Cr. Total Length of Project is 312.450 Km, the total Project Cost is 9373.50 Cr.