CHAPTER 0 EXECUTIVE SUMMARY

0.1 INTRODUCTION

The National Highways & Infrastructure Development Corporation Limited (NHIDCL) has been entrusted with the assignment for providing Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Up gradation to 4-lane with paved shoulder of Jammu-Akhnoor section of NH-144A Union Territory of Jammu & Kashmir. The Consultancy Services for this project has been awarded to Anandjiwala Infra Advisory.

The Letter of Acceptance for this assignment was issued by General Manager (Tech) vide their letter No. NHIDCL/J&K/NH-144A/J-A/PKG-III(B)/2019-20/321, dated 05-08-2019.An index Map of the project corridor is shown in **Figure 0-1 Index Map.**

The name of the Project Highway as per RFP is Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Up gradation to 4-lane with paved shoulder of Jammu-Akhnoor section of NH-144A Union Territory of Jammu & Kashmir. The total length of the project highway is **3.744 km.** The location of the project highway is shown below.

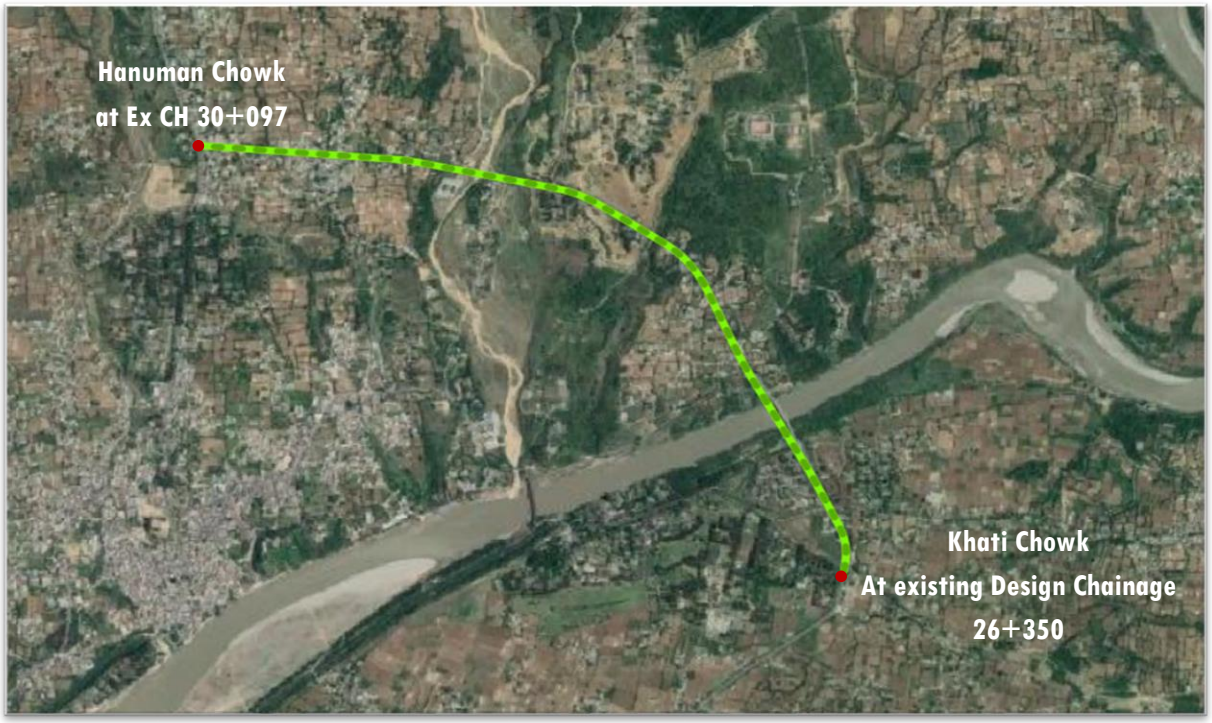

Figure 1.1: Location of the Project Highway

0.2 OVERVIEW OF NHIDCL ORGANISATION AND ACTIVITIES, AND PROJECT FINANCING AND COST RECOVERY MECHNAISM

National Highways and Infrastructure Corporation Limited (NHIDCL) is a fully owned company of the Ministry of Road Transport & Highways, Government of India.

The company promotes surveys, establishes, designs, builds, operates, maintains and upgrades National Highways and Strategic Roads including interconnecting roads in parts of the country which share international boundaries with neighboring countries. The regional connectivity so enhanced would promote cross border trade and commerce and help safeguard India's international borders. This would lead to the formation of a more integrated and economically consolidated South and South East Asia. In addition, there would be overall economic benefits for the local population and help integrate the peripheral areas with the mainstream in a more robust manner. An approximate aggregate length of 10,000 kms has been identified to begin with for development through this company. The company envisages creating customized and specialized skills in terms of addressing issues like complexities of geographical terrains and addressing extensive coordination requirements with security agencies. The company would also endeavor to undertake infrastructure projects including but not restricted to urban infrastructure and urban or city transport and to act as an agency for development of all types of Infrastructure. The company envisages working towards cross sharing of technical know-how and enhancing opportunities for business development with other nations and their agencies including the multilateral organizations and institutions.

The company also proposes to improve road connectivity and efficiency of the international trade corridor, by expanding about 500 KMs of roads in the North Bengal and Northeastern region of India to enable efficient and safe transport regionally with other South Asia Sub-regional economic Cooperation (SASEC) member countries. These projects are being funded by ADB (Asian Development Bank).

0.3 PROJECT ALIGNMENTS

EXISTING ALIGNMENT

TABLE 0-1 EXISTING CROSS DETAILS

Carriageway Width (m)	Earthen Shoulder Width (m)	Embankment Height (m)
7-10 m varies	**0.5 m to 0 varies**	**0.5-6 m varies**

Existing Right of way

It is observed existing Right of Way varies from 7 m to 12m along the project highway, the existing ROW has been presented on the basis of following points

- Rural Section: Formation width is considered as existing ROW
- Urban Section: Distance between Building lines is considered as available ROW

LAND USE PATTERN ALONG THE ALIGNMENT

The land use patterns along the project road are built up, barren and agricultural in which predominant land use pattern is barren.

There are total of 4 main settlements: Jandial, Ambaran, Dasgal and Akhnoor varying in size and populations along the project corridor.

EVALUATION OF PROPOSED ALIGNMENT

The alignment continues from the currently constructed road (Jammu Akhnoor section Package 1) at Chainage 26+350 in the portion of circular curve. It passes through flat terrain following concentric widening on the existing highway up to Khatti chowk. Then, the split portion of alignment starts for the proposed new bridge. Split portion takes a left turn and passes through existing army area where the approach for the new bridge is designed. The new bridge starts at CH 26+900 and continues till CH 27+300. The alignment then merges with the RHS split (existing alignment) at CH 27+650. Afterwards the alignment tries to follow the existing center line deviating in short stretches to accommodate design standards wherever necessary with widening on both sides of alignment.

DURING THE PRESENTATION, IT WAS CONCLUDED BY NHIDCL THAT THE PROPOSED ALIGNMENT BRIDGE OPTION 2 SERVES ENSURES THAT THE NEW BRIDGE IS MORE THAN 110M FROM THE ASI SENSITIVE ZONE ALONG THE EXISTING ALIGNMENT. THE PROPOSED OPTION TAKES CARE OF THE ARCHAEOLOGICAL SITE & REMAINS (AMENDMENT AND VALIDATION) ACT' 2010 (AMASR ACT) WITH EFFECT FROM 29.03.2010, WHERE EVERY AREA WITHIN 100 M AROUND THE PROTECTED LIMITS HAS BEEN DECLARED AS "PROHIBITED AREA" WHERE NO PERMISSION FOR PUBLIC WORK OR PROJECTS ESSENTIALS TO THE PUBLIC OR OTHER CONSTRUCTION SHALL BE GRANTED AND FURTHER BEYOND IT UP TO 200 M IS DECLARED AS "REGULATED AREA".

Salient Features of the Alignment are as follows:

- Total Length- 3.744 Km
- Bridges- 3 Nos.

0.4 METHODOLOGY ADOPTED FOR THE FEASIBILITY REPORT

General scope of services **COVERS** but not limited to the following major tasks:

TABLE 0-2 TASK APPROACH

Task No.	Sub Task	Description of the Task
2		**Feasibility Report**
	2.1	Collection of Secondary Data
	2.1.1	Data on Socio-Economic Profile
	2.1.2	Past Traffic Census and Review of Reports, Accident Data
	2.1.3	Data on land-use Tourism and Industry
	2.1.4	Collection of Topographical Maps and Engineering Reports
	2.2	Proposed Alignment Alternatives
	2.2.1	Study of Topographical maps
	2.2.2	Preliminary Topographical survey
	2.2.3	Preliminary design and selection of Final Alignment
	2.4	Analysis of Traffic data and Traffic Forecast
	2.4.1	Identification of Project Influence Area
	2.4.2	Determination of Influence Factors
	2.4.3	Estimation of Growth Rates & Future Traffic Demand
	2.4.4	Assessment of Demand Supply Gap
	2.5	Environmental and Social Impact Assessment
	2.5.1	Delineation of Study area for Assessment
	Environmental Impact Assessment	
	2.5.2	Field Reconnaissance and Project Features
	2.5.3	Regulatory Applicability Assessment
	Social Assessment	
	2.5.4	Preliminary Screening
	2.5.5	Collection of Base line Socio-Economic Data
	2.6	Engineering Surveys
	2.6.1	Topographical Survey
	2.6.2	Inventory and condition survey of roads and Bridges
	2.6.3	Sub-grade Investigations
	2.6.4	Hydrological studies
	2.6.5	Geotechnical Investigations
	2.6.6	Material Investigation
	2.7	Design
	2.7.1	Alignment Option Study
	2.7.2	Preliminary GADs of Bridges and Structures
	2.8	Submission of Feasibility Report

0.5 SOCIO-ECONOMIC PROFILE OF THE PROJECT AREA

The Socio-economic profile has been developed to provide an overview of the socio-economic set up of the state with relative status of project area district of Jammu. The details include the demographic features, past performance and perspective growth of the economy, population and urbanization envisaged in the Twelfth five-year plan.

The Gross State Domestic Product (GSDP) at constant (2011-12) prices for the year 2017-18 is estimated at Rs. 109136.52 crore, as against the estimate of Rs 100597.57 crore for 2016- 17, indicating growth of 8.49 per cent during 2017-18. At current prices, GSDP for 2017-18 is estimated to be Rs 140886.76 crore as against the estimate of Rs. 126230.91 crore for 2016- 17, showing an increase of 11.61 per cent during the year.

The projected estimates for the year 2018-19 at constant (2011-12) prices and current prices of GSDP is Rs 116637.44 crore and Rs. 157383.77 crore

The state economy is expected to register growth of 8.49% (Advanced) during the financial year 2017-18 at constant prices of 2011-12 as compared to growth rate of 3.29% achieved during 2016-17. The projected growth for the year 2018-19 is roughly estimated at 6.87%.

Traffic surveys were done along the project corridor. Share of traffic from different area were determined along the corridor. The Project Influence Area (PIA) is the relative importance of the project road in terms of the share of traffic contributed by various states/ districts. The broad influence area of the project road is taken as the State of Jammu and Kashmir since majority of the traffic served by the road is from the state. The immediate influence area consists of the district of Jammu through which the corridor passes and hence the areas directly served by the project road

0.6 TRAFFIC SURVEYS AND ANALYSIS

As per TOR, Traffic survey is not part of the current assignment since this has already been conducted by the previous consultant for the entire stretch of road from Jammu to Akhnoor. Present study refers to the data made available by NHIDCL for this activity. Following is summary of data available from previous study

- Classified Traffic Volume Count (7 days) – 1 location
- Origin-Destination Survey (OD) – 2 locations
- Axle Load Survey – 2 locations
- Intersection Turning Movement Count Survey– 2 locations
- Truck Terminal Survey – 1 location
- Pedestrian and Animal Count Survey – 2 locations
- Speed and Delay Survey – Entire length

The details of survey are shown in Chapter 6 – Traffic Survey and Analysis

CLASSIFIED TRAFFIC VOLUME COUNTS

The traffic surveys have been carried out at 1 location. The Average Annual Daily Traffic volume (AADT) and Average daily traffic volume (ADT) on the project road is provided below:

ADT: 6119
AADT: 5984 (PCU)

As per Capacity analysis, the traffic will exceed the 4-lane with paved shoulder capacity with LOS B in the year 2053.

TRAFFIC FORECAST

The future traffic demand assessment is made based on the past available data. Traffic forecasts are made for the horizon year 2053 which will form the basis for further work on pavement design, wayside amenities, intersection/ interchange design and developing capacity augmentation proposals.

Traffic forecast has been based on demand elasticity approach, wherein a relationship was established between traffic and socio-economic indicators. Traffic growth rates by vehicle type, for the project road corridor have been determined. The projection for future traffic involves critical analysis of some of the key Socio-economic indicators and the rate of change expected during the study period in the project influence area.

0.7 ENGINEERING SURVEYS AND INVESTIGATIONS

The various surveys and investigations which have been carried out are as follows:

- Inventory and condition survey of Road and Pavement.
- Detailed topographic survey
- Inventory and condition survey of Bridges, Cross Drainage & other structures.
- Material Investigations-Under Process
- Geo Technical investigation for bridges and structures-Under Process

Following observation are made from survey and investigation of existing road.

- The Project Road is of 2- lane configuration of 7m with paved shoulder (varies)
- The Pavement condition of the existing road is generally good.
- There is one religious' structure along the Project road sections which is the impediments to the development proposal and careful considerations are required at such locations for the widening/improvements.
- The traffic signage system on the project road is not comprehensive and extensive as necessary based on the standards guidelines and codes. There is no provision of informatory sign while approaching the settlements or junctions or any other facility provided along the project road.

0.8 INDICATIVE DESIGN STANDARDS, METHODOLOGIES AND SPECIFICATIONS

The existing road is proposed to be constructed as four lanes with paved shoulder configuration based on the Traffic demand as indicated Chapter 7. Number of existing deficient geometry curves have been replaced with desired curves radius, as applicable for Plain and Rolling terrain.

TABLE 0-4: SUMMARY OF PROPOSED BRIDGES

Span expressed as Number x Clear width (m) x Clear height (m)

Location	Chainage	Type of structure	Type of Construction	Span (m)	Total Length (m)	Type of Superstructure	Remark
1	27+100	MJB	New (2 Lane)	1x96+1x160+1x96	352	PSC Superstructure	
2	28+780	MNB	New (2 Lane)	6x10x6	60	6 Cell Box Bridge	
3	29+840	MNB	New (2 Lane)	1x7x4	7	Box Culvert	

TABLE 0-5 SUMMARY OF PROPOSED CULVERTS

S. No.	Chainage	Existing Arrangement	Proposed Span(m)	TCS	Remark
1	26+818	1x1x2 SLAB	1x1x3 (BOX)	At Grade	RE-CONSTRUCTION
2	26+848	1x1x2 SLAB	1x1x3 (BOX)	At Grade	RE-CONSTRUCTION
3	28+077	1x3x3 BOX (SKEW)	1x3x3 (BOX)	At Grade	RECONSTRUCTION
4	28+362	1x3x3 BOX	1x6x3.5 (BOX)	At Grade	RECONSTRUCTION
5	28+586	1x3x3 BOX	1x6x6 (BOX)	At Grade	RECONSTRUCTION
6	29+025	1x2.8X2.5 BOX	1x6x4 (BOX)	At Grade	RECONSTRUCTION
7	29+327	1x1.4x2 BOX	1x6x4 (BOX)	At Grade	RECONSTRUCTION
8	29+641	1x6x3.5 PUP SLAB	1x3x3 (BOX)	At Grade	RECONSTRUCTION
9	30+217	1X2.7X3 BOX	1x6x4 (BOX)	At Grade	RECONSTRUCTION

0.9 PAVEMENT DESIGN

New Construction

Since pavement study had already been conducted for the entire stretch, this activity was out of scope for the current assignment. Pavement design and recommendation from the previous study has been adopted for the current report. Summary of pavement detail is provided below for ready reference.

TABLE 0-6: PAVEMENT CRUST DETAILS FOR NEW CONSTRUCTION (FLEXIBLE PAVEMENT)

Chainages		Design	Effective	BC	DBM	WMM	GSB	SG (mm)
From	To	MSA	CBR %	(mm)	(mm)	(mm)	(mm)	
26+615	30+359	20	8	30	90	250	200	500
			Adopted	30	90	250	200	500

0.10 ENVIORNMENTAL SCREENING AND PRELIMINARY ENVIRONMENTAL ASSESSMENT

The proposed project alignment takes off at Chainage 26+350 which connects to ongoing construction of road from Jammu to Akhnoor section.

Salient Features of the Alignment are as follows:

- Total Length- 3.744 km
- Bridges- 3 Nos.

The tract of the proposed project area is in plain and rolling rugged terrain. The land use patterns along the proposed project road in the existing alignment are built up and barren with pre-dominantly built up areas. The proposed project road crosses various surface water bodies including one river namely Chenab. The project falls under seismic intensity Zone V, which is classified as very high damage risk zone. The proposed project area falls in relatively clean environment. Pollution levels may be very low.

Impact of the proposed development activity on the surrounding environment will be assessed and mitigation measures will be proposed in EIA & EMP report to minimize the adverse impacts & enhancement measures for positive impacts. The budgetary provision for environmental management activities has been taken as per GOI norms.

0.11 INITIAL SOCIAL ASESSMENT AND PRELIMINARY LAND ACQUISTION/RESETTLEMENT PLAN

As a part of the project development process, concerted effort has been made to minimize the adverse social impact by integrating the social concerns in design and planning of the up-gradation proposals. There will be very few direct impacts on Project Affected Households. The Road is passes through plain and rolling terrain and no major habitation has been impacted except few residential structures and commercial establishment at end of alignment and land acquisition will be undertaken.

The resettlement and rehabilitation action plan would be formulated based on the *Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act* (RFCTLARR) 2015 will be applicable only.

0.12 COST ESTIMATES BASED ON PRELIMIRAY RATE ANALYSIS AND BILL OF QUANTITIES

TABLE 0-8 SUMMARY OF COSTS

COST IN CRORES

Sr. No.	Item Description	Amount in INR	Weightage w.r.t. to civil cost	Cost per Km. INR
1	Site Clearance and Dismantling	1.00	0.85%	0.27
2	Excavation and earthwork	5.46	4.63%	1.46
3	Sub-bases, bases (non-bituminous)	5.42	4.60%	1.45
4	Bituminous work	5.35	4.54%	1.43
5	Cross Drainage Works			
A	Major Bridges	46.17	39.16%	12.33
B	Culverts without cushion	7.08	6.00%	1.89
C	Culverts with cushion+VUP+LVUP	9.46	8.02%	2.53
D	Minor Bridges	7.51	6.37%	2.01
E	Foot Over Bridge	2.55	2.16%	0.68
6	Protective works (Toe wall/Stone pitching/Ret. wall) + Drainage	19.29	16.36%	5.15
7	Traffic signs and Road marking	0.47	0.40%	0.13
8	Miscellaneous Items		0.00%	
A	Street Lighting + Misc.	1.92	1.63%	0.51
B	Major, Minor Junctions & Cross road improvement	2.03	1.72%	0.54
C	Bus Shelters	0.08	0.07%	0.02
D	Temporary Road construction at MNB	0.17	0.14%	0.05
E	Traffic Barriers during construction	0.05	0.04%	0.01
I	**TOTAL CIVIL COST (A) In Crores**	**114.01**		
9	Utility Shifting Cost (B)	3.90	3.31%	
	Per km cost	**30.45**		
i	**Goods & Service Taxes (GST) @12% of (A+B)**	14.15		
II	**Total Civil + Utility Shifting Cost (C) In Crores including GST**	**132.06**		
i	Contingency 1% of (A)	1.14		
ii	Supervision 3% of A	3.42		
iii	Agency Charges 3% of A	3.42		

Sr. No.	Item Description	Amount in INR	Weightage w.r.t. to civil cost	Cost per Km. INR
iv	Escalation as per phasing 5% of A (40% phasing) for 2020-21 & 5% of A (60% phasing) for 2021-22 = 5% of A	5.70		
v	Maintenance during Maintenance period (2.5% of A)	2.85		
III	**CENTAGES**	**16.53**		
	Estimated project cost	**148.59**		
	Per km Project cost	**39.69**		
IV	**LA Cost**	**50.00**		
	Total Capital cost of the project	**198.59**		
	Per km Project cost	**53.04**		