भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India
(Ministry of Road Transport and Highways)
जी-5 एवं 6, सेक्टर-10, द्वारका, नई दिल्ली-110075
G-5 & 6, Sector-10, Dwarka, New Delhi-110075
दूरभाष / Phone : 91-11-25074100/25074200
फैक्स / Fax : 91-11-25093507 / 25093514

संदर्भ सं.1013/1/2k/Env./ 68

दिनांक: 06.11.2020

The Director, IA-III (Infra-1)
वन, पर्यावरण एवं जलवायु परिवर्तन मंत्रालय,
इंदिरा पर्यावरण भवन, अलीगंज,
जोर बाग मार्ग, नई दिल्ली – 110 003

विषय: **Development of access controlled Ludhiana-Bhatinda Greenfield highway starting from Delhi-Katra Expressway (NE-5) near Ludhiana (village Ballowal) and terminating on Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the state of Punjab under Bharatmala Pariyojana (length 76.290Km.).**

Ref.

1. NHAI Letter No. 1013/1/2k/Env./ 65 dated 06.10.2020
2. MoM of 246th EAC Meeting at Agenda Item No. 3.8
3. MoEF&CC ADS dated 04.11.2020

महोदय,

The above mentioned project was considered by EAC during its 246th Meeting held 21.10.2020 as Agenda Item No. 3.8. Hon'ble Committee Members recommended the ToR on the revised alignment submitted by NHAI with certain conditions.

It is submitted that there are some revision of project features like length, No. of structure, Chainage, etc. due to revision of alignment. Accordingly, revised Form-1, Pre-feasibility Report, proposed TOR, Alignment Map and KML File are being uploaded for compliance of ADS dated 04.11.2020.

The hard copy of revised Form-1 and proposed TOR along with alignment Map will be submitted with MoEF&CC as per norms for granting approval of TOR.

You are requested to grant approval of ToR for the project at the earliest.

धन्यवाद,

भवदीय,

बी. मुखोपाध्याय

बी. मुखोपाध्याय

संलग्नक – यथोपरि

Tugal
Sudhar Link Rd
Gurusar Sudhar
Sahauli
Sahauli-Dhaipai Link Road
Dhaipai
Gujjarwal Rd
Chaminda
Aitiana - Sudhar Link Rd
Sudhar
Abbuwal Link Rd
Aitiana - Braich Link Rd
Aittiana
Raikowal Link Road
Rattowal
Sarabha
Gujjarwal
Halwara
Toosa
Halwara - Toosa Link Rd
Shahpur
Pakhowal - Ludhiana Rd
Leel Link Rd
Rajoana Kalan
Rajoana Khurd
Leel
Dangon-Leel Rd
Dangon
Pakhowal - Dehlon Rd
Phallewal
Rajoana Khurd Link Rd
Pakhowal Rd
Nangal Khurd
Kailey
Pakhowal
Pakhowal Village
Nangal Kalan
Rajoana Burj Hari Singh Wala
Pakhowal - Raikot Rd
Nurpur
Burj Hari Singh Wala
Burj Hakima
Barmi
Littar
Latala
Andlu
Google Earth
Image © 2020 CNES / Airbus
© 2020 Google
Image © 2020 Maxar Technologies

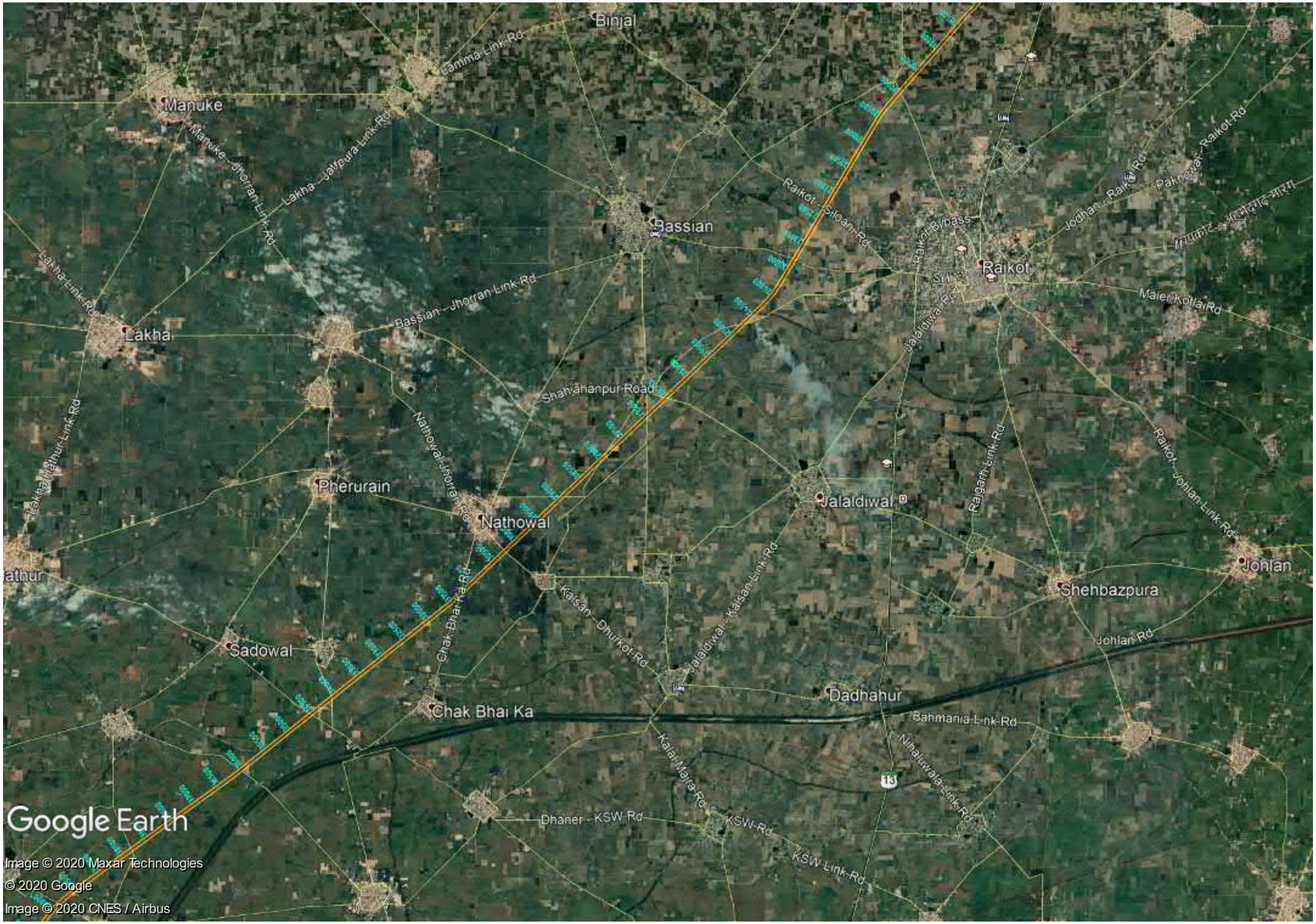
Binjal
Manuke
Manuke - Jhorran Link Rd
Lakha - Jalpura Link Rd
Raikot - Sibaan Rd
Bassian
Raikot Bypass
Raikot
Jodhan - Raikot Rd
Pakhowal - Raikot Rd
Lakha Link Rd
Bassian - Jhorran Link Rd
Maler Kotla Rd
Lakha
Jalaldiwal Rd
Shahjahanpur Road
Nathowal-Jhorran Link Rd
Pherurain
Nathowal
Jalaldiwal
Raigarh Link Rd
Raikot - Johlan Link Rd
Johlan
Shehbazpura
Kalsan - Dhurkot Rd
Jalaldiwal - Kalsan Link Rd
Chak Bhai Ka Rd
Sadowal
Johlan Rd
Dadhahur
Chak Bhai Ka
Bahmania Link Rd
Kalal Majra Rd
Nihalwala Link Rd
Dhaner - KSW Rd
KSW Rd
KSW Link Rd
Google Earth
Image © 2020 Maxar Technologies
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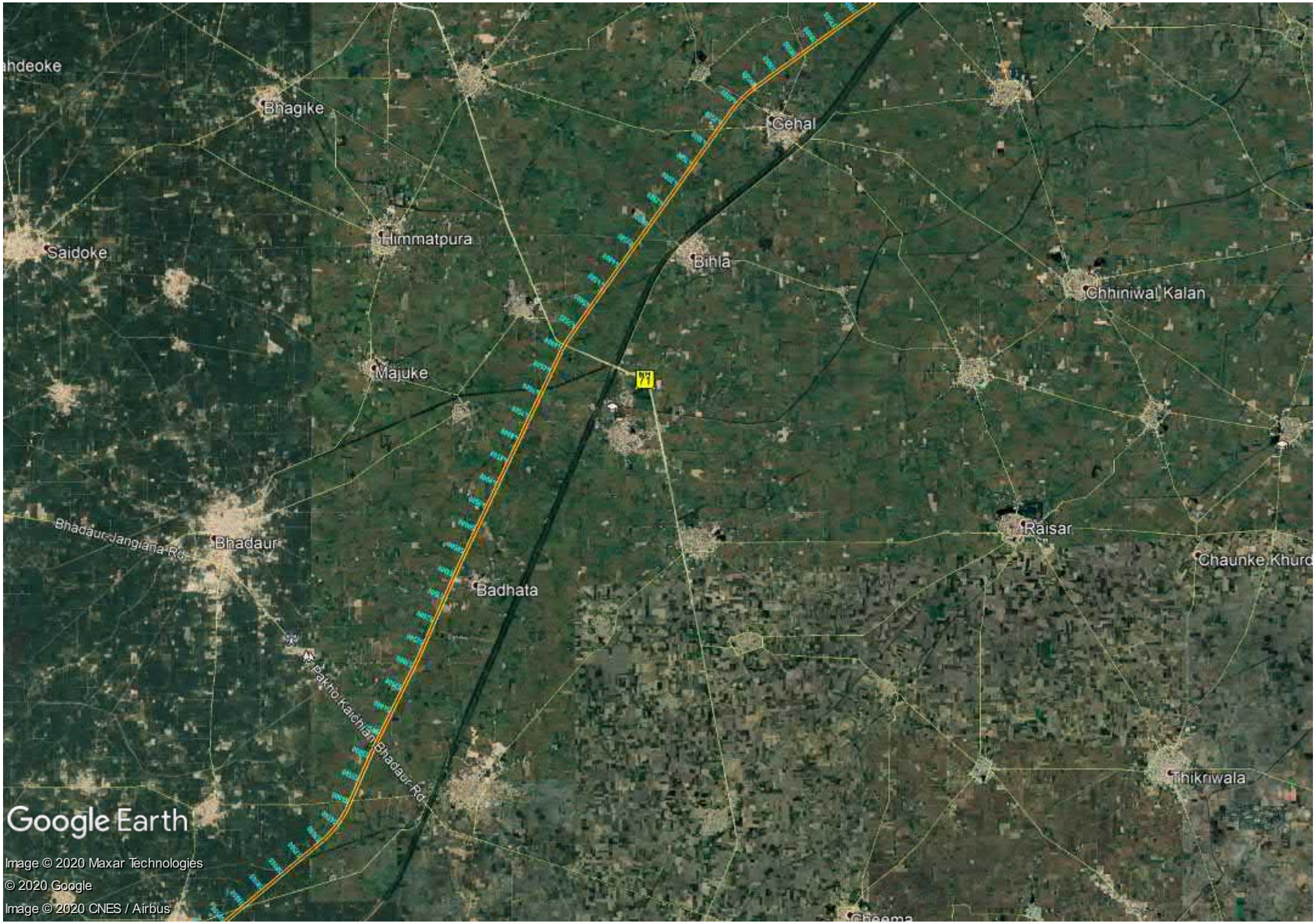
Image © 2020 CNES / Airbus


Bhagike
Cehal
Himmatpura
Saidoke
Bihla
Chhiniwal Kalan
Majuke
Bhadaur-Jangiana Rd
Bhadaur
Raisar
Badhata
Pakho Kalchian Bhadaur Rd
Tihkriwala
Google Earth
Image © 2020 Maxar Technologies
© 2020 Google
Image © 2020 CNES / Airbus

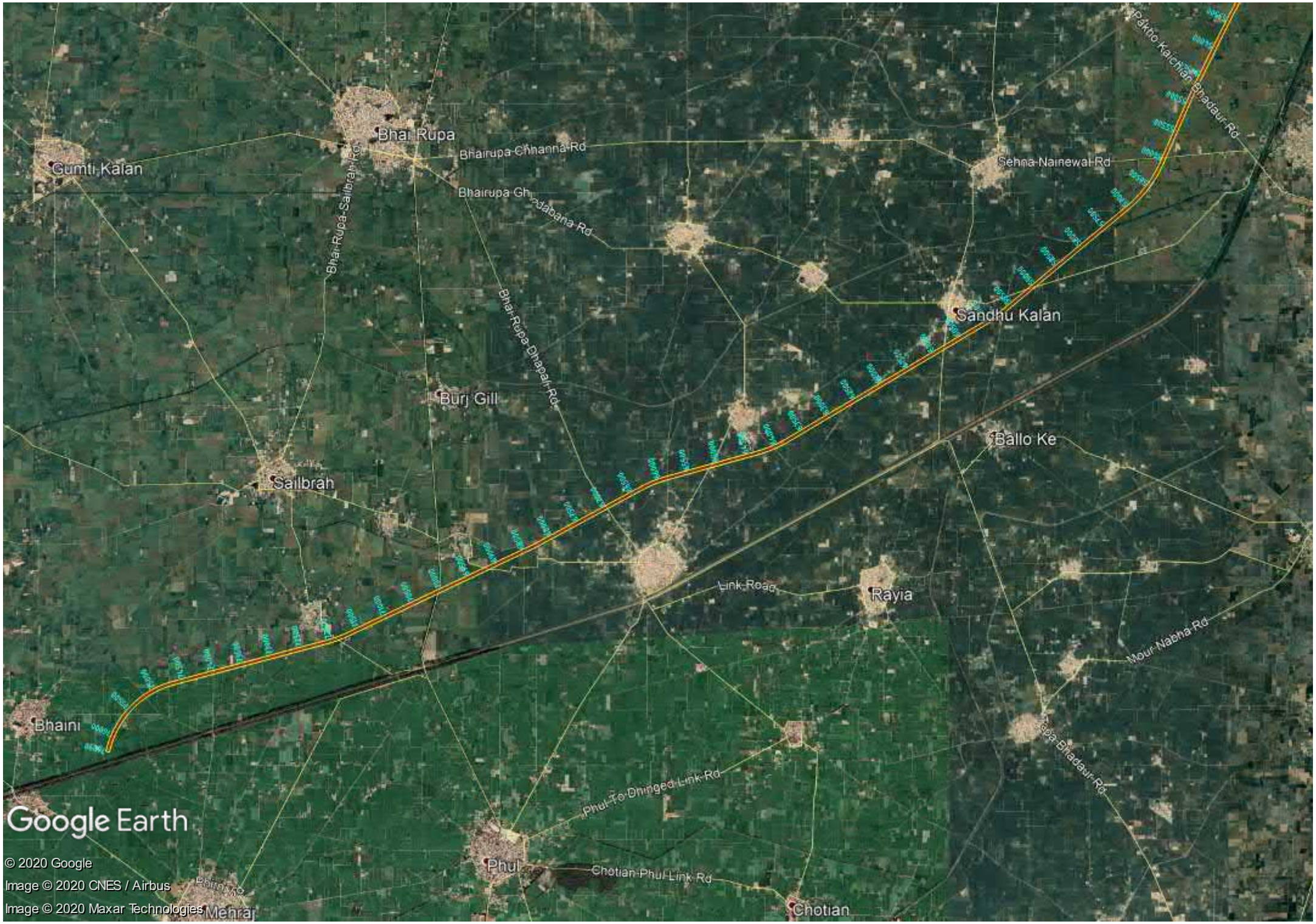

Bhai Rupa
Gumti Kalan
Bhairupa-Chhanna-Rd
Bhairupa Ghudabana Rd
Bhai-Rupa-Sailbrah-Rd
Bhai-Rupa-Dhapali-Rd
Sehna-Nainewal-Rd
Pakho Kalchian Bhadaur Rd
Sandhu Kalan
Burj Gill
Ballo Ke
Sailbrah
Link Road
Rayia
Mour Nabha Rd
Bhaini
Phul To Dhingad Link Rd
Phul
Chotian Phul Link Rd
Chotian
Mehraj
Google Earth
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Image © 2020 Maxar Technologies

Annexure-III

Information in respect of each item shall be provide in brief. No annexure/enclosure shall be referred. If required list of annexure/enclosures may be provided in the end.

S.No	ITEM	INFORMATION
1.	Brief description of the Proposal:	Development of access-controlled Ludhiana-Bathinda Greenfield Highway, starting from Delhi-Katra Expressway of NE-5 near Ludhiana (village Ballowal) and terminating at Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the State of Punjab under Bharatmala Pariyojana by M/s National Highways Authority of India (Total Length 76+290 Km)
2.	Nature of project (New/ Expansion/ Amendment/ Extension etc.):	New
3.	Whether the proposal was considered in earlier meetings of EAC: If yes, provide date of EAC meeting and reasons for deferment, if any:	Not Applicable
4.	Whether proposal is part of interlinked project: If yes, provide details in brief:	Yes this Project is part of interlinked project which is detailed below: 1. Ludhiana – Rupnagar – 110 km (Proposal No IA/PB/NCP/178014/2020 and File No 10-64/2020-IA.III). 2. Amritsar – Bathinda – 155 km (Proposal No. IA/PB/NCP/178369/2020 and File No. 10-65/2020-IA.III The same has been listed in Agenda 3.12 and 3.9. The reference Map is attached as Appendix - I
5.	Address of project site (Plot No./ Village/ Tehsil/ District/State):	The project passes through 3 district that is Ludhiana through Tehsil - Ludhiana, Rajkot, Barnala through Tehsil – Barnala, Tapa and Bathinda district through Tehsil - Rampura Phul. The proposed ROW is 60m and it traverses through revenue area of 36 Villages. The details of District, Tehsil with their respective village is attached as Appendix- II
6.	Geo-coordinates of project site: The Geo-coordinate of start and end point of the proposed alignment is given in Table below:	Start Point: Junction of Ludhiana Ring Road (RR) & at NE-5 of Delhi-Katra Expressway Geo-coordinate 30°45'59.33"N/ 75°45'28.22"E End Point: at Amritsar-Bathinda Greenfield Highway near Bhaini Village Geo-coordinate 30°20'22.00"N/ 75°10'27.92"E

<table>
<tr><th>S.No</th><th>ITEM</th><th>INFORMATION</th></tr>
<tr><td>7.</td><td>Site alternatives under consideration:</td><td></td></tr>
<tr><td>8.</td><td>Area (ha)/Length (km) of the proposed project:</td><td>Total land requirement 457.74 Ha (448.74 Ha. Agricultural land) and (9 Ha. Protected Forest Land- along irrigation canal, railways line, roads, bunds etc)</td></tr>
<tr><td>9.</td><td>Connectivity to the site:</td><td>The proposed construction site is well connected with National Highways, State Highways, Major District Road, Other district Roads and Village Roads. The connectivity with National Highways as per details below:

NH-1, NH-95, Ludhiana Ring Road, NE-5 of Delhi-Katra Expressway, NH-71, Amritsar-Bathinda Greenfield Highway Expressway.</td></tr>
<tr><td>10.</td><td>Investment/Cost of the project (Rs. in Lakh):</td><td>1716.17 Crore or 171617 Lakhs as civil cost</td></tr>
<tr><td>11.</td><td>Item of Schedule to the EIA Notification, 2006:</td><td>7(f)</td></tr>
<tr><td>12.</td><td>Applicability of General/Specific Conditions as per EIA Notification, 2006:</td><td>The Conditions as Mention in General Condition (GC) and Specific Condition (SC) to the EIA Notification 2006 is not applicable</td></tr>
<tr><td>13.</td><td>Why appraisal/ approval is required at the Central level:</td><td>The Proposed Highway is Greenfield Highway, so it attracts the provision of Environmental Clearance as per the schedule to the 14th September, 2006 EIA Notification and its amendments made on 22nd August 2013. This is Category A project as per the Schedule; hence Environmental Clearance need to be obtained at Central Level.</td></tr>
<tr><td>14.</td><td>Whether project involves any violation under notification S.O 804(E) dated 14.03.2017:</td><td>Not Applicable</td></tr>
<tr><td>15.</td><td>Land use/Landover of project site in tabular form:</td><td>Land use/ Landover within 1 km
<table>
<tr><th>S.No</th><th>Land use/ Land cover</th><th>Area Ha</th><th>%</th></tr>
<tr><td>1</td><td>Crop land</td><td>15290.831</td><td>95.27%</td></tr>
<tr><td>2</td><td>Built-up land</td><td>667.969</td><td>4.16%</td></tr>
<tr><td>3</td><td>Govt land</td><td>81.66</td><td>0.51%</td></tr>
<tr><td>4</td><td>Forest Area</td><td>9.00</td><td>0.06%</td></tr>
<tr><td></td><td>Total</td><td>16049.46</td><td>100.000</td></tr>
</table>
Remarks: 95.27% of the PROW is under Crop Land Cover (Agricultural). The Land use/Land Cover Map is attached as Appendix -III</td></tr>
<tr><td>16.</td><td>Land use/Landover around 10 km radius of project site (1 km in case of Highway projects):</td><td>Land use/Landover within 5 km
<table>
<tr><th>S.No</th><th>LULC Type</th><th>Area Ha</th><th>% LULC</th></tr>
<tr><td>1</td><td>Crop land</td><td>81669.13</td><td>94.53%</td></tr>
<tr><td>2</td><td>Built-up land</td><td>4309.87</td><td>4.99%</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>S.No</th><th>ITEM</th><th>INFORMATION</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>3</td><td>Govt land</td><td>407.94</td><td>0.47%</td></tr>
<tr><td>4</td><td>Forest Area</td><td>9.00</td><td>0.01%</td></tr>
<tr><td></td><td>Total</td><td>86395.94</td><td>100.000</td></tr>
</table>
Remarks: The predominant land use within 5 km radius is Crop Land (Agricultural) i.e 94.53% is under Cultivation. The Land use/Land Cover Map is attached as Appendix -IV.
</td></tr>
<tr><td>17.</td><td>List to industries to be housed with the proposed project site, only for projects covered under 7(c) category of EIA Notification, 2006:</td><td>Not Applicable</td></tr>
<tr><td>18.</td><td>Right of Way (RoW), only for projects covered under 7(f) category of EIA Notification, 2006:</td><td>The proposed Right of Way is 60 meters.</td></tr>
<tr><td>19.</td><td>Terrain and topographical features:</td><td>Terrain of the proposed alignment is plain (flat) land and is predominantly an agricultural land. The Contour Map prepared based on LISS-III and ARC GIS Software, the contour of project site varies between 216 m to 247 m above Mean Sea Level.</td></tr>
<tr><td>20.</td><td>Details of water bodies, impact on drainage:</td><td>Details given below of water bodies along three options:
<table>
<tr><th>Proposed Options</th><th>Rivers/Nala's</th><th>Irrigation Canals</th><th>Ponds</th></tr>
<tr><td>Option-1</td><td>Nil</td><td>26</td><td>Nil</td></tr>
<tr><td>Option-2</td><td>Nil</td><td>25</td><td>4</td></tr>
<tr><td>Option-3</td><td>Nil</td><td>24</td><td>7</td></tr>
</table>
</td></tr>
<tr><td>21.</td><td>Water requirements, sources (during construction and operation phases) and NOC:</td><td>

Water for Construction works- about 895,000KLD (Canal water/Surface water)
Water at Camp Site- about 75.6 KLD (The source of water will be met through private water takers augmented with ground water extraction-approvals from SGWB)
Operation Phase- about 4.5 KLD

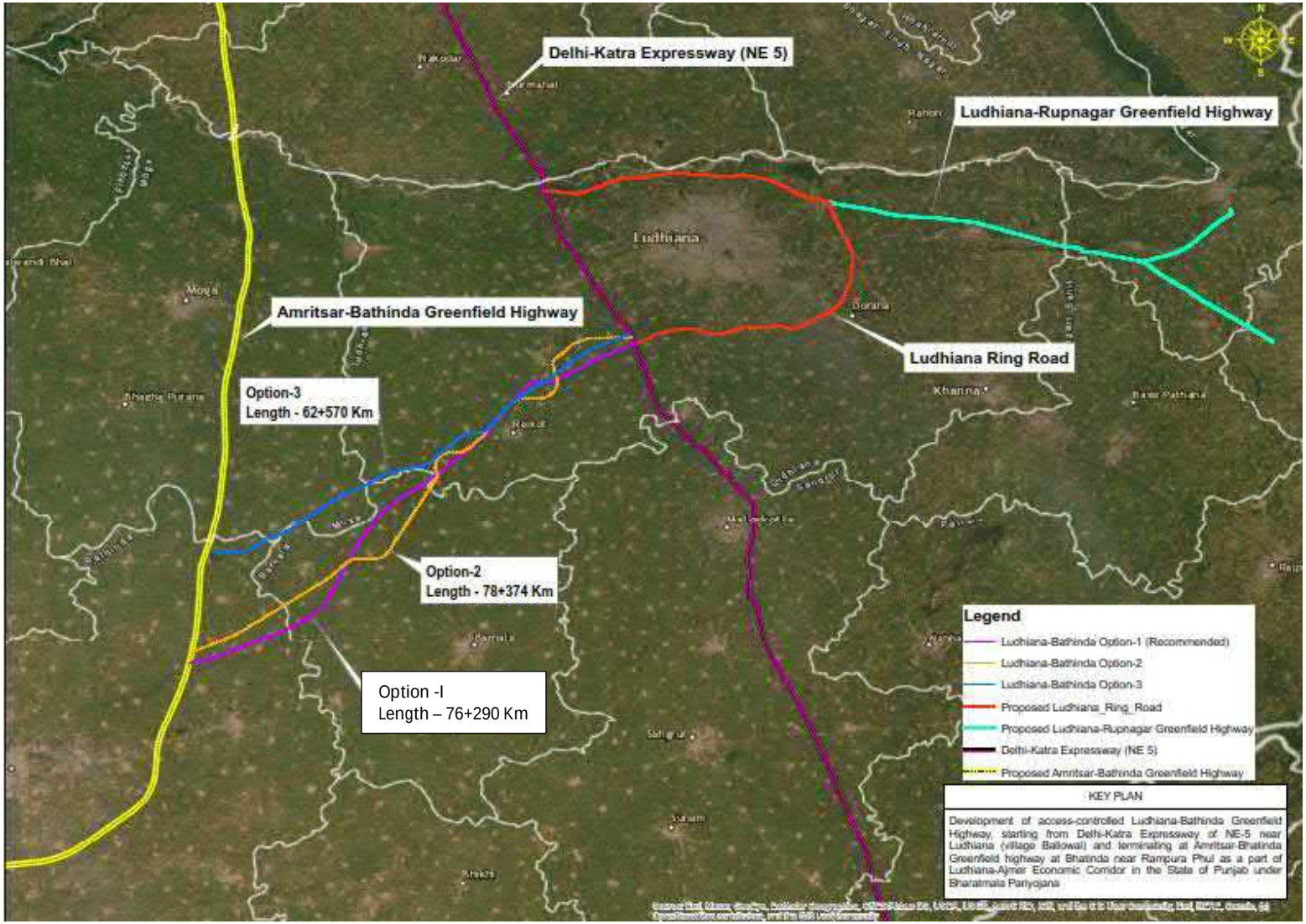
</td></tr>
<tr><td>22.</td><td>Groundwater extraction/usage and NOC/Clearance from CGWA/State Ground Water Department:</td><td>No ground water will be obstructed. If required ground water extraction will be anticipated after obtaining NoC from the CGWA/ State Ground Water Department.</td></tr>
<tr><td>23.</td><td>Whether the project is in Critically Polluted area:</td><td>Not Applicable</td></tr>
<tr><td>24.</td><td>Tree cutting, types, numbers, girth size etc.:</td><td>Tree cutting details for proposed three options as given below:
<table>
<tr><th rowspan="2">Proposed Options</th><th colspan="2">Forest</th><th colspan="2">Non-Forest</th></tr>
<tr><th>Fruits</th><th>Non-fruits</th><th>Fruits</th><th>Non-fruits</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S.No</th><th>ITEM</th><th>INFORMATION</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Option-1</td><td>19</td><td>1038</td><td>39</td><td>461</td></tr>
<tr><td>Option-2</td><td>57</td><td>1261</td><td>290</td><td>587</td></tr>
<tr><td>Option-3</td><td>43</td><td>1189</td><td>210</td><td>742</td></tr>
</table>
</td></tr>
<tr><td>25.</td><td>Whether the project involves diversion of forest land: If yes, provide the extent of the forest land involved and status of the forest clearance.</td><td>The Proposed project will involve diversion of approximately 9 Ha. of Protected forest land declared under The Punjab Land Preservation (Chos) Act, 1900.</td></tr>
<tr><td>26.</td><td>Whether the project is located within 10 km of Protected Areas (PA) including National Parks, Sanctuaries and Tiger Reserves etc.: If yes, provide details of the PA, distance from project site and status of clearance from National Board for wild life.</td><td>No protected area within 10km boundary of the PROW</td></tr>
<tr><td>27.</td><td>Whether the project is located within the Eco-Sensitive Zone (ESZ) or Eco-Sensitive Area (ESA) notified by the MoEF&CC: If yes, provide the status of recommendation of the Monitoring Committee of ESZ/ESA.</td><td>Not Applicable</td></tr>
<tr><td>28.</td><td>Whether project site is in CRZ area if yes furnish the CRZ map:</td><td>Not Applicable</td></tr>
<tr><td>29.</td><td>CETP: Provide details type and quantity of effluent, effluent conveyance system from the member units to CETP with CETP's Capacity.</td><td>Not Applicable</td></tr>
<tr><td>30.</td><td>STP: Provide details of treatment and usage of treated sewage with STP's capacity:</td><td>Not Applicable</td></tr>
<tr><td>31.</td><td>For projects related to Port and harbour, provide details on:
a. Handling of each cargo, storage, transport along with spillage control, dust preventive measures
b. Details of fishing activity in the vicinity</td><td>Not Applicable</td></tr>
<tr><td>32.</td><td>Brief description of Socio-economic condition of local</td><td>The proposed Project Highway shall provide connectivity to proposed Ludhiana International</td></tr>
</table>

S.No	ITEM	INFORMATION
	people:	Airport at Halwara, present connectivity of which is congested. Therefore, to cater the present & predicted traffic and to enhance economic development in Ludhiana and Punjab, greenfield highway is the only solution from socio-economic and ecological point of view.
33.	Land acquisition and R&R issues involved:	About 457.74 ha land acquisition will be required for project implementation as per Land Acquisition Act, 2013, which is the amendment of Land Acquisition Act 1956.
34.	Employment potential, No. of people to be employed:	500 people during construction phase and about 100 peoples during operation phase at toll plaza and for road surveillance and maintenance work.
35.	Benefits of the project:	The project will have multiple benefits. It will improve efficiency of freight movement to Delhi, Haryana, Rajasthan and Punjab. Overall improvement will be expected in local area in following ways: Development and improvement in transportation infrastructure facility will connect villages with the nearby cities Better approach to Medical & Educational services and quick transportation of perishable goods like fruits, vegetables and dairy products. Development of tourism and pilgrimage. Transporting, processing and marketing of agricultural products. Fast and safe connectivity resulting in savings in fuel, travel time and total transportation cost to the society. Reduction in pollution due to reduction in congestion Indirect and direct employment opportunity to people from all skilled, semiskilled and unskilled streams will act as social benefits. It is assumed that the overall Bharatmala project will boost socio-economic development in the entire central region of Delhi, Haryana, Rajasthan & Punjab. It will also save fuel consumption decreasing

S.No	ITEM	INFORMATION
		pollutant emission in environment.
36.	Details of Court cases:	Not Applicable

Appendix -I Google Map Showing Inter Link Proposed Road

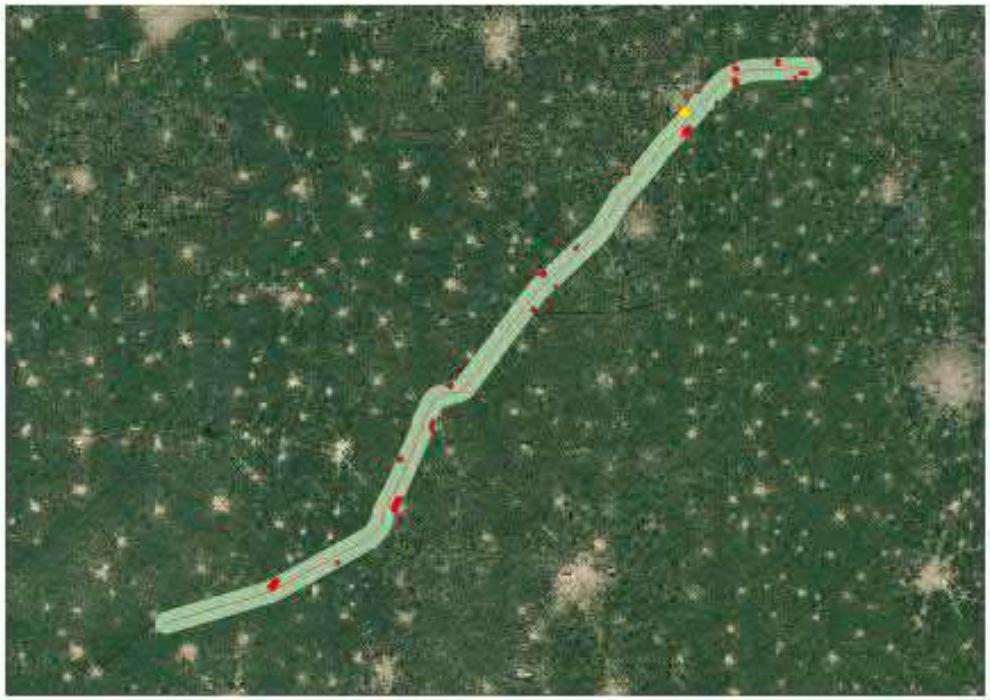


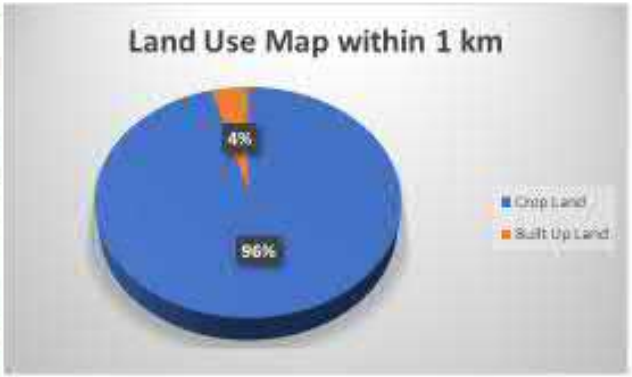
Appendix-II: List of District with their respective Tahsil and Villages.

Sl. No.	Districts	Tahsil	Sl. No.	Village
1	Ludhiana	Ludhiana (West)	1	Narangwal
			2	Ballowal
			3	Chamiuda
			4	Gujjarwal
		Raikot	5	Sarabha
			6	Shahpur
			7	Toosa
			8	Leel
			9	Kailey
			10	Halwara
			11	Burj Littan
			12	Nurpur
			13	Burj Hari Singh Wala
			14	Rupa Patti
			15	Raikot
			16	Jalaldiwal
			17	Nathowal
2	Barnala	Barnala	18	Chak Bhai Ka
			19	Gagewal
			20	Sadowal
			21	Chinniwal Khurd
		Tapa	22	Narengarh Sohia
			23	Gehal
			24	Bihla
			25	Ramgarh
			26	Deepgarh
			27	Tallewal
			28	Badhata
			29	Sehna
			30	Sandhu Kalan
			31	Ballo Ke
			32	Phule Wala
3	Bathinda	Rampura Phul	33	Dhapali
			34	Harnam Sigh Wala
			35	Sadhana
			36	Bhaini

Appendix – III : Landuse/Land cover within 1 Km from PROW boundary

Land Use 1km from PROW





LULC TYPE	Area in Ha	% Landuse
Crop Land	15290.831	95.27%
Built Up Land	667.969	4.16%
Govt Land	81.66	0.51%
Forest Area	9	0.06%
Total	16049.46	100.00%

Appendix – IV : Landuse/Land cover within 1 Km from PROW boundary

Land Use 5km from PROW

LULC TYPE	Area in Ha	% Landuse
Crop Land	81669.13	94.53%
Built Up Land	4309.87	4.99%
Govt Land	407.94	0.47%
Forest Area	9	0.01%
Total	86395.94	100.00%

246th meeting of Expert Appraisal Committee

Agenda No. 3.8 Development of access-controlled Ludhiana-Bathinda Greenfield Highway, starting from Delhi-Katra Expressway of NE-5 near Ludhiana (village Ballowal) and terminating at Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the State of Punjab under Bharatmala Pariyojana by M/s National Highways Authority of India (Total Length 76+290 Km) - Terms of Reference

Proposal No IA/PB/NCP/177976/2020 and File No. 10-63/2020-IA.III

Brief Summary of Project

1. Ludhiana is the industrial town of Punjab and is also known as Manchester of North India. The Industrial units mostly comprise of small-scale industrial, which produce industrial goods, machine parts, auto parts, household appliances, hosiery, apparel, and garments. Ludhiana is Asia's largest hub for bicycle manufacturing and produces more than 50% of India's bicycle production of more than 10 million each year. Ludhiana produces 60% of India's tractor parts and a large portion of auto and two-wheeler parts. Many parts used in German cars such as Mercedes and BMW are exclusively produced in Ludhiana to satisfy the world requirement. It is one of the largest manufacturer of domestic sewing machines. Hand tools and industrial equipment are other specialties.
2. Therefore, for the purpose further bolstering the economic connectivity and to promote export based industries, it is important that the connectivity to Ludhiana is made efficient, congestion free and is connected with other major industrial towns for raw material, ports for export and major cities as consumption centers. The only existing major connectivity to Ludhiana is NH 44 from Delhi. It severely lacks connectivity with western states such as Gujarat, Maharashtra and Rajasthan.
3. NHAI is also developing Delhi Katra Expressway (NE 5) which shall provide seamless connectivity to Ludhiana with Delhi and shall connect it with Delhi Mumbai Expressway through KMP Expressway. NHAI also developing Amritsar Bathinda Greenfield highway which shall provide connectivity of Northern Districts of Punjab (Amritsar, Gurdaspur, Hoshiarpur, Jalandhar, etc) with Bathinda and further with Rajasthan and Gujarat. Apart from above, NHAI is improving existing NH network in Punjab under Bharatmala Pariyojana. These roads shall further connect with Trans – Rajasthan connecting directly with Ajmer thereby bolstering connectivity with ports in Gujarat.
4. In continuation of the same, and to provide seamless connectivity to Ludhiana with Ports in Gujarat through Rajasthan under Ludhiana Ajmer Economic Corridor, a Greenfield Highway connecting Ludhiana and Bathinda is proposed. The project highway shall start from Delhi Katra Expressway (NE 5) near Ludhiana (village Ballowal) and terminating at Bathinda near Rampura Phul on Amritsar-Bathinda Greenfield Highway.
5. Ludhiana – Bathinda Corridor shall provide the much needed important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana.
6. Present route from Ludhiana to Bathinda pass through NH 95, SH 13 at Mullapur Dakha and Barnala NH 64. There are existing settlements at the intersection of these roads and length is also longer. The existing roads cannot be widened due to presence of built up structures. Therefore,

further increase in traffic on these roads shall lead to increase in air & noise pollution, wastage of natural resources, / fuels, vehicle operation cost as well as travel time.

7. The proposed Project Highway shall provide connectivity to proposed Ludhiana International Airport at Halwara, present connectivity of which is congested. Therefore, to cater the present & predicted traffic and to enhance economic development in Ludhiana and Punjab, greenfield highway is the only solution from socio-economic and ecological point of view.

8. **Proposal:** The proposed project is the development of access-controlled Ludhiana-Bathinda Greenfield Highway, starts at Delhi-Katra Expressway of NE 5 and ends Amritsar-Bathinda Greenfield Highway in the state of Punjab (Total Length 76+290 Km).

9. **Location:** The proposed project is the development of access-controlled Ludhiana-Bathinda Greenfield Highway, starts at Delhi-Katra Expressway of NE 5 (at Ballowal village of Ludhiana West Tahsil) and ends at Amritsar-Bathinda Greenfield Highway (near Rampura Phul Tahsil) in the state of Punjab. Total length of Ludhiana-Bathinda Greenfield Highway is 76+290 Km. The proposed alignment is passing through 5 Tahsils (Ludhiana and Raikot Tahsils) of Ludhiana district, (Barnala and Tapa Tahsils) of Barnala district and (Rampura Phul Tahsil) of Bathinda district in the state of Punjab.

10. **Land Acquisition and RoW:** The land required for construction of proposed corridor is tentatively 457.74 ha, which includes forest land 9 ha forest land and 448.74 ha private / government land. Width of proposed Right of way (PROW) is 60 m in general. At location of interchanges, highway amenities, toll plaza and truck parking, extra land has been proposed as per the actual design requirement.

11. **Land Use within PROW (1000 m either side):** The alignment is passing through plain terrain. The predominant land use along the alignment is agricultural (95.27%) followed by built-up area (4.16%), Govt land (0.51%) and Forest/tree cover (0.06%).

12. **Land Use of the Site and around the site up to 5 Km radius:** The predominant land use along the alignment is agricultural (94.53%) followed by Build-up area (4.99%), Govt. land (0.47%) and Forest/tree cover- (0.01%).

13. **Justification for selection of the site:** The Alignment has been selected based on various parameters. These are listed below:

    a. Take off location has been selected as it is the intersection point of proposed outer ring road of Ludhiana and Delhi Katra Expressway (NE 5).
    b. Alignment is proposed along the existing canal so as to have minimum impact on the private agriculture land and avoid wastage.
    c. The alignment provides fast connectivity to Ludhiana International Airport at Halwara.
    d. The alignment shall open the potential of developing new industrial parks along the Highway at Raikot, Barnala and Rampura Phul along with Logistics Parks.
    e. The Alignment Options were presented to the Authority in the meeting chaired by Chairman NHAI and Member Projects. The alignment was subsequently approved in the meeting.

14. **Proposed development**

Total length	76+290
Proposed Right of Way	60 m in general
No. of major bridges	Nil
No. of minor bridges	5
No. of culverts	27
Interchanges	2 (Km 0+000 & Km 76+290)
Fly-over	2
VUP/LVUP/SVUP	37
Vehicular Overpass	--
Way side Amenities	Type – A : 1
Toll Plaza	1 at chainage 50+594
Truck Parking	At 1 locations
Embankment	▪ Total length of embankment - 74.500 km ▪ Average height of embankment > 2.5 m
Drain	▪ Total length of unlined Open drain - 126 km ▪ Total length of Box drain – 30.0 km
Safety Measures	▪ 3 beam metal crash barriers ▪ Advanced Traffic Management System (ATMS) ▪ Signage as per IRC 67 ▪ Anti Glare Screens at Curves ▪ Required Road Markings and Studs

15. **Estimated Project Cost:** Rs. 1716.17 Crores

16. **Diversion of Forest Land:** The proposed project involves diversion of ≅ 9 ha of protected forest land.

17. **National Park/ Wildlife Sanctuary & Eco-Sensitive Zone in 10 km radius:** The proposed Ludhiana-Bathinda Greenfield Highway **does not pass through** Ecologically Sensitive Zone of Wildlife Sanctuary/ National Park etc within 10 Km radius.

18. **CRZ Area:** The alignment not passing through any CRZ Area.

19. **Tree cutting, types, number, girth size etc.:** About 1594 trees are proposed to be felled in the forest and non-forest area. Prior permission would be taken from the concern authority before tree felling.

20. **Whether the project is in Critically Polluted area:** No

21. **Water Bodies, diversion if any:** The proposed greenfield highway does not crosses over Main Canal network at any locations. It is crossings over minor canals and natural drains. Construction of bridges and culverts has been proposed to prevent diversion of these minor canal and natural drains.

22. **Terrain, level with respect to MSL, requirement of filling if any:** The proposed highway passes through mainly plain and rolling terrain with an elevation varies from about 216 m to 247 m above

MSL.

23. **Utilization of Fly Ash:** Fly ash will be utilized for construction of embankment as per IRC Guidelines (IRC:SP:58-2001). Quantity of fly ash to be utilized for the project is 2,340,000 cum.

24. **Water Requirement, source, status of clearance:** Total water requirement for construction period of is 8,95,000 KL (1225 KLD). It would be sourced from surface (60%) and ground water (40%). The required permission will be obtained by the Contractor prior to construction.

25. **Court cases if any:** No

26. **Employment potential:** Approx. 500 workers both skilled and unskilled during construction phase of 2 years and approx. 100 during operation phase.

27. **Benefits of the project:** The proposed greenfield highway will provide fast connectivity between Delhi - Amritsar – Ludhiana to Bathinda. The proposed corridor will reduce the travel time, vehicle operating cost, no. of accidents, increase employment opportunity and improve economic development of the region.

    NHAI is also developing Delhi Katra Expressway (NE 5) which shall provide seamless connectivity to Ludhiana with Delhi and shall connect it with Delhi Mumbai Expressway through KMP Expressway. NHAI also developing Amritsar Bathinda Greenfield highway which shall provide connectivity of Northern Districts of Punjab (Amritsar, Gurdaspur, Hoshiarpur, Jalandhar, etc) with Bathinda and further with Rajasthan and Gujarat. Apart from above, NHAI is improving existing NH network in Punjab under Bharatmala Priyojana. These roads shall further connect with Trans – Rajasthan connecting directly with Ajmer thereby bolstering connectivity with ports in Gujarat.

    In continuation of the same, and to provide seamless connectivity to Ludhiana with Ports in Gujarat through Rajasthan under Ludhiana Ajmer Economic Corridor, a Greenfield Highway connecting Ludhiana and Bathinda is proposed. The project highway shall start from Delhi Katra Expressway (NE 5) near Ludhiana (village Ballowal) and terminating at Bathinda near Rampura Phul on Amritsar-Bathinda Greenfield Highway.

    Ludhiana – Bathinda Corridor shall provide the much needed important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana.

    Present route from Ludhiana to Bathinda pass through NH 95, SH 13 at Mullapur Dakha and Barnala NH 64. There are existing settlements at the intersection of these roads and length is also longer. The existing roads cannot be widened due to presence of built up structures. Therefore, further increase in traffic on these roads shall lead to increase in air & noise pollution, wastage of natural resources, / fuels, vehicle operation cost as well as travel time.

    The proposed Project Highway shall provide connectivity to proposed Ludhiana International Airport at Halwara, present connectivity of which is congested. Therefore, to cater the present & predicted traffic and to enhance economic development in Ludhiana and Punjab, greenfield highway is the only solution from socio-economic and ecological point of view.

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Agenda No. 3.8 Proposal No IA/PB/NCP/177976/2020 and File No. 10-63/2020-IA.III

PROPOSED TERMS OF REFERENCE (TOR)

FOR

PROPOSED DEVELOPMENT OF ACCESS CONTROLLED LUDHIANA-BHATINDA GREENFIELD HIGHWAY STARTING FROM DELHI-KATRA EXPRESSWAY (NE-5) NEAR LUDHIANA (VILLAGE BALLOWAL) AND TERMINATING ON AMRITSAR-BHATINDA GREENFIELD HIGHWAY AT BHATINDA NEAR RAMPURA PHUL AS A PART OF LUDHIANA-AJMER ECONOMIC CORRIDOR IN THE STATE OF PUNJAB UNDER BHARATMALA PARIYOJANA (TOTAL LENGTH = 76+290 KM)

Submitted by

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

PROPOSED TERMS OF REFERENCE FOR EIA STUDY

1. Introduction

The Ministry of Road Transport and Highways, Govt. of India has launched Bharatmala Pariyojana in Year 2015 to improve the efficiency of freight in India. Under Bharatamala Pariyojna, Projects will involves the constructions or improvement of national highways/ newly declared National Highways with an aim to improve road connectivity to border areas, ports, backward areas, religious and tourist sites. The project has identified 44 economic (freight) corridors, inter-corridors and feeder-routes for development. Proposed project is also a part of Bharatmala Pariyojana, brief details of project are as below:

S. No	Package No	Classification	Corridor Name	Road	State	Length (km)	Stretch Name (Start-End)
1	--	Economic Corridor	Ludhiana-Bathinda-Greenfield Highway	Green Field	Punjab	76+290	Junction of Delhi-Katra Expressway (NE 5) at village Ballowal to Bathinda near Bhaini

2. Project Screening as per EIA notification 2006 and amended till date (Category-7(f))

Applicability of EC:

Ludhiana – Bathinda Greenfield Highway shall provide the much-needed important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana. Therefore, this greenfield highway is new national highway.

As per the Ministry of Environment and Forests 14th September 2006 EIA notification and its amendment dated 1st December 2009 and Office Memorandum of MoEF dated 22nd August, 2013. As per the schedule to the EIA Notification, all New National Highway are to be considered as 7(f) Category "A" project and will be appraised by Expert Appraisal Committee (EAC), MoEF&CC, GoI.

This comprehensive Terms of Reference (TOR) address all relevant environmental concerns. The EIA Report will be prepared based on the Terms of References (TOR) given in Environmental Impact Assessment Guidance Manual for sector 7(f) – Highways and as per the additional ToR issued by Ministry of Environment, Forests and Climate Change (MoEF&CC) after project scoping.

3. Approach of the EIA Study

As prescribed under Appendix III of the EIA Notification, 2006 and it's amendment made after , the proposed approach will include the following:

i. Collection of project information

ii. Collection of environment and social baseline data with reference to the biological, physical and social components of environment within study area

iii. Identification and analysis of applicable legislations

iv. Identification, prediction, quantification and evaluation of potential impacts of the proposed project

v. Recommendations for prevention measures, control measures and mitigation measures for adverse impacts (during construction, operation and decommissioning phase)

vi. Conducting additional studies such as Public hearing, risk assessment, traffic etc. as per the TOR granted by EAC.

vii. Preparation of Environmental Management Plan (EMP) including mitigation measures and monitoring program

4. Methodology of the EIA Study

i. Establishing the initial baseline data on environmental parameters viz., air, water, noise, land use, soil, micrometeorology, existing traffic and communication, biological, and socio-economic data in the study region.

- A study area of 5 km radius from the project boundary to be identified;
- Primary environmental baseline data proposed to be collected for a study period of October 2020 to December 2020.
- Secondary data and information on various environmental aspects like hydrogeology, hydrology, drainage pattern, ecology, meteorology and socio-economic aspects (census data of the study area) will be collected from different institutions, government offices and available literature.

ii. Preparation of EIA report after identification of areas of concern and measures of their possible impact for the proposed project & proposing appropriate Environmental Management Plan (EMP) & Monitoring Plan;

iii. Conducting public hearing

iv. Incorporation of public hearing inputs in the EIA report

Baseline Studies

Secondary data and information on various environmental aspects like hydrogeology, hydrology, drainage pattern, ecology, meteorology and socio-economic aspects (census data of the study area) will be collected from different institutions, government offices and available literature. In order to establish the environmental conditions of the proposed site, baseline studies will be carried out including Land Environment, Water Environment, Air Environment, Socio-Economics and Demographics, Soil and Hydrology, Meteorology within the study area. Study area of 5 km radius from the project boundary is to be identified. Primary environmental baseline data proposed to be collected for a study period of October 2020 to December 2020.

The details of methodology to be used for conducting baseline studies are as given below:

A. Land environment

i. Description of the existing situation of the land along the alignment, study of the land use pattern, habitation, cropping pattern, forest area, environmentally sensitive places, notified industrial areas, river, lake etc. by using land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery and also through secondary data sources, falling within an aerial distance of 5 km from the project boundary;

ii. Data of the proposed land and its availability (Details of villages, survey numbers of the area, tehsil, districts) for earmarking for the project;

iii. Inventory of the environmental features such as trees/ forests if any/ drainage lines, rivers and water crossings/ irrigation water courses/ water bodies/grazing lands/ cultural properties/ utilities/ community facilities/ schools/hospitals/ seasonal markets or cultural congregations etc, along the proposed highway should be prepared;

iv. Soil analysis data: Data pertaining to type, classification, characteristics, soil properties, etc. Area falling within influence zone (along the project) along the alignment on either side will be considered to monitor the baseline quality;

v. Geology: Baseline data on rock types, regional tectonic setting (reported fractures/faulting, folding, warping), and history of any volcanic activity, seismicity and associated hazards. Information on quarry yields, strength of rock, distance of quarries from habitat, restrictions for quarrying, environmental controls, statutory permissions, etc. shall be provided.

vi. Topography: Baseline data needs on existing situation of the land at the proposed project area, including description of terrain features (plain, rolling, hilly), slope and elevation.

vii. Identification of quarries, stone crushers and borrow areas;

Soil Monitoring and Analysis Plan:
Selection of Samples From 4 locations within study area along the project road.
Details: Representative soil samples will be collected & analyzed for the following parameters.
Duration: October 2020 to December 2020
Parameters: Bulk density, porosity, salinity, texture class (percentage wise silt, clay and ratio (SAR), water holding capacity, Fe, Cu, Zn, Mn, Ni, permeability, physico- chemical analysis and relevant metals

B. Air and Noise Environment
The study on air and noise environment shall broadly cover the following:

i. Identification of air/ noise pollution sources, location of sensitive features

ii. Monitoring the existing status of ambient air/ noise quality within the impacted region

iii. Information will be collected on traffic volume for roads near intersections by conducting traffic volume monitoring. The traffic volume counts will be recorded continuously for 24 hours at one time during the study period to assess the existing total daily traffic, peak hour traffic and traffic composition

iv. Collection of meteorological data, viz. wind speed and direction, humidity, ambient temperature, rainfall etc. through secondary sources.

v. Estimation of quantities of air emissions including fugitive emissions from the proposed project;

vi. Identification, quantification and evaluation of other potential emissions (including those of vehicular traffic) within the impact zone and estimation of all the emissions/ impacts;

vii. Prediction of changes in the ambient air quality;

viii. Prediction of future noise levels resulting from the proposed project and related activities including increase in vehicular movement;

ix. Delineation of mitigation measures at source, path ways and receptors

Air Monitoring and Analysis Plan:

Number of stations	: 8 locations around project site
Duration	: October 2020 to December 2020
Parameters	: PM_{10}, $PM_{2.5}$, NOx, SO_x, CO and O3.
Method of sampling and Analysis	: As per the methods suggested by CPCB under NAAQS Standard
Other Details	: Identification of air pollution sources, significant environmental features and location of sensitive features.

Noise Monitoring and Analysis Plan:

Number of stations	: 10 locations around project site
Duration	: October 2020 to December 2020
Parameters	: Continuous sound level meter
Method of sampling and Analysis	: IS: 4954 as adopted by CPCB.

C. Water Environment

Water environment includes both surface and ground water environment. Study on water environment shall broadly cover the following:

i. Study of surface water, ground water (existing sources) within right of way and within 500 m from the right of way

ii. Both surface and ground water will be monitored within study area at 7 and 5 locations respectively.

iii. Availability of water and its actual demand;

iv. Precautions for ensuring water/ ecological quality of streams and water bodies;

v. Details of water quality; proposals for wastewater treatment and management;

vi. Sources of sewage generation, treatment method, etc.;

Water Monitoring and Analysis Plan:

Number of station	: Surface / Ground water within project area depending upon the availability (river/ canal / nalla/ open well/bore well etc)
Duration	: October 2020 to December 2020
Parameters	: Color, odor, temperature, pH, turbidity, total hardness (Mg & Ca), TSS, TDS, total alkalinity, chloride, sulphate, nitrate, Na, K, salinity, total nitrogen, total phosphorous, DO, BOD, COD, phenol, O & G, heavy metals, total coliform, faecal coliform for surface Water Ground Water Parameters will be as per IS:10500(2012)
Method of sampling and Analysis	: Standard methods and parameter for Examination of Water and Wastewater published by American Public Health Association (APHA) and IS-302.

D. Socio-Economic Data

The socio-economic study shall broadly cover the following:

i. Details of settlements in study area of 5 km radius for:

- Demographic pattern including literacy rate, male female ratio
- Settlements on and around the proposed Alignment
- Present Occupational / employment / livelihood pattern
- Basic amenities details
- Health status of the communities, existing infrastructure facilities
- awareness of the population about the proposed activity

ii. Activities likely to come up in surrounding areas due to influence of project etc.

E. Biological Environment

i. Assessment of flora and fauna in the study area consisting of core and buffer zone (5 km radius) (enumeration of species, documentation on the basis of life forms, habitats)

ii. Collection of primary/secondary data (authenticated/ based on actual field surveys) on forest and non-forest flora in impact zone with respect to above parameters and forest area and floristic structure, rare and endangered species, endemic species, ethno-botanical aspects, medicinal plants, major & minor forest produce, afforestation/ social forestry

iii. Information on sanctuaries/ national parks/ biosphere reserves. If the alignment affects sanctuaries/ national parks/ biosphere reserves/forest etc. necessary clearances or diversion proposal will be dealt with separately.

iv. Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index, etc. within the study area in different ecosystems, wetland area wherever applicable

v. Estimation of number and types of trees which would be cut during deforestation for proposed activity and facilities

vi. Estimation of damage to flora and fauna due to proposed activities, land use/ landscape changes

vii. Study regarding the existing animal crossings/bypasses/underpasses etc. as applicable across the habitation areas shall be carried out.

Details of baseline study of biological environment to be carried out:
Number of station locations: Core and buffer zone (5 km radius)
Duration: October 2020 to December 2020

Methodology for Impact Assessment

i. Preliminary environment impact assessment of the alignment as per provisions of the applicable legislations;

ii. Identification of environmental and ecological sensitive areas, water bodies, forests and heritage structures through the satellite imageries;

iii. Based on the proposed design, incremental impacts are to be assessed;

iv. Identification of the potential significant impacts based on Aspect-Impact Matrix;

PRE-FEASIBILITY REPORT (PFR)

Agenda No. 3.8 Proposal No IA/PB/NCP/177976/2020 and File No. 10-63/2020-IA.III

Pre-Feasibility Report for EIA-EMP Study & Obtaining Environmental Clearance for Proposed Development of access controlled Ludhiana-Bhatinda Greenfield highway starting from Delhi-Katra Expressway (NE-5) near Ludhiana (village Ballowal) and terminating on Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the state of Punjab under Bharatmala Pariyojana (Total Length = 76+290 Km).

SUBMITTED BY

NATIONAL HIGHWAYS AUTHORITY OF INDIA

Ministry of Road Transport & Highways, Government of India

G-5 & 6, Sector-10, Dwarka-New Delhi-110075

TABLE OF CONTENT

1 EXECUTIVE SUMMARY

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Proposed project is also a part of Bharatmala Pariyojana, brief details of project are as below:

S. No	Package No	Classification	Corridor Name	Road	State	Length (km)	Stretch Name (Start-End)
1	--	Economic Corridor	Ludhiana-Bathinda-Greenfield Highway	Green Field	Punjab	76+290	Junction of Delhi-Katra Expressway (NE 5) at village Ballowal to Bathinda near Bhaini Village

2 INTRODUCTION OF PROJECT/BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROJECT AND PROJECT COMPONENT:

Ludhiana is the industrial town of Punjab and is also known as Manchester of North India. The Industrial units mostly comprise of small-scale industrial, which produce industrial goods, machine parts, auto parts, household appliances, hosiery, apparel, and garments. Ludhiana is Asia's largest hub for bicycle manufacturing and produces more than 50% of India's bicycle production of more than 10 million each year. Ludhiana produces 60% of India's tractor parts and a large portion of auto and two-wheeler parts. Many parts used in German cars such as Mercedes and BMW are exclusively produced in Ludhiana to satisfy the world requirement. It is one of the largest manufacturer of domestic sewing machines. Hand tools and industrial equipment are other specialties.

Therefore, for the purpose further bolstering the economic connectivity and to promote export based industries, it is important that the connectivity to Ludhiana is made efficient, congestion free and is connected with other major industrial towns for raw material, ports for export and major cities as consumption centers. The only existing major connectivity to Ludhiana is NH 44 from Delhi. It severely lacks connectivity with western states such as

Gujarat, Maharashtra and Rajasthan.

NHAI is also developing Delhi Katra Expressway (NE 5) which shall provide seamless connectivity to Ludhiana with Delhi and shall connect it with Delhi Mumbai Expressway through KMP Expressway. NHAI also developing Amritsar Bathinda Greenfield highway which shall provide connectivity of Northern Districts of Punjab (Amritsar, Gurdaspur, Hoshiarpur, Jalandhar, etc) with Bathinda and further with Rajasthan and Gujarat. Apart from above, NHAI is improving existing NH network in Punjab under Bharatmala. These roads shall further connect with Trans – Rajasthan connecting directly with Ajmer thereby bolstering connectivity with ports in Gujarat.

The Alignment Options were presented to the Authority in the meeting chaired by Chairman NHAI and Member Projects. The alignment was subsequently approved in the meeting.

Project Proponent: National Highway Authority of India (NHAI).

Note: This PFR is prepared as per selected and approved alignment. Alternative analysis of other Alignments will be given in EIA/EMP study.

2.2 BRIEF DESCRIPTION OF NATURE OF THE PROJECT:

The proposed project is the development of access-controlled Ludhiana-Bathinda Greenfield Highway, starts at Delhi-Katra Expressway of NE 5 (at Ballowal village of Ludhiana West Tahsil) and ends at Amritsar-Bathinda Greenfield Highway (near Rampura Phul Tahsil) in the state of Punjab. Total length of Ludhiana-Bathinda Greenfield Highway is 76+290 Km. The proposed alignment is passing through 5 Tahsils (Ludhiana and Raikot Tahsils) of Ludhiana district, (Barnala and Tapa Tahsils) of Barnala district and (Rampura Phul Tahsil) of Bathinda district in the state of Punjab.

Proposed road width/ PRoW is of 60 meter all through the road other than area of Toll Plaza, section of service road, at way side amenities.

2.3 NEED FOR THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY AND OR REGION:

This proposed corridor interlinks different State & National Highways. The improvement will speed up the freight movement and provide a better access to vehicles as a link to the National Highways. Apart from that, it promises to revive the agriculture, tourism, education as well as better connectivity in and around the district. After construction of project road the travel time between Ludhiana to Bathinda will be of 0.5 hour as this road section will have connectivity with;

Ludhiana – Bathinda Corridor shall provide the much needed important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana.

Thus, this planning will not only reduce travel time but also improve the district's economic growth.

- ❖ Take off location has been selected as it is the intersection point of proposed outer ring road of Ludhiana and Delhi Katra Expressway (NE 5).
- ❖ Alignment is proposed along the existing canal so as to have minimum impact on the private agriculture land and avoid wastage.
- ❖ The alignment provides fast connectivity to Ludhiana International Airport at Halwara.
- ❖ The alignment shall open the potential of developing new industrial parks along the Highway at Raikot, Barnala and Rampura Phul along with Logistics Parks.

2.4 DEMAND AND SUPPLY GAP

Not Applicable

2.5 IMPORTS VS. INDIGENOUS PRODUCTION

Not Applicable

2.6 EXPORT POSSIBILITY

Not Applicable

2.7 DOMESTIC / EXPORT MARKETS

Not Applicable

2.8 EMPLOYMENT GENERATION (DIRECT AND INDIRECT) DUE TO THE PROJECT:

Highway construction broadly encompasses the process of construction and maintenance, including the design, contracting, implementation, supervision, and maintenance of highways and related structures, such as bridges and flyover etc. The areas covered includes public works, private contracting of civil works, and labor-based construction techniques. For this purpose, approximately 500 labours shall be employed per day for a period of 24 month. Also, during operation of highway around 100 persons will get

employment at toll plaza, Patrolling including medical staff and in maintenance of highway.

Direct employment generation: During the construction phase manpower will be needed to take the part in various project activities. Skilled, semi-skilled and unskilled labors, will likely to get work. In the post construction phase, it is expected that the project will provide social benefits to local people in terms of direct employment by way of better commercial and industrial development of the area.

Indirect Employment: The project shall also induce indirect employment generation for cleaners, guards, local vendors, operation and maintenance workers etc. Local vendors, construction material traders, electrician, plumbers etc. will be benefitted through employment generated during construction and maintenance phase.

3 PROJECT DESCRIPTION

3.1 TYPE OF PROJECT INCLUDING INTERLINKED AND INTERDEPENDENT PROJECTS, IF ANY

Not Applicable.

3.2 LOCATION (MAP SHOWING GENERAL LOCATION, SPECIFIC LOCATION AND PROJECT BOUNDARY AND PROJECT SITE LAYOUT) WITH COORDINATES

Map attached as **Annexure - I.**

3.3 DETAILS OF ALTERNATIVE SITES CONSIDERED AND THE BASIS OF SELECTING THE PROPOSED SITE,

This PFR is prepared as per selected alignment. Comparison and detailed report on alternative alignment analysis will be provided in EIA/EMP study. However, initial details and comparison is elaborated separately and attached at the end of this report. The details of three alternatives (options study) has attached as **Annexure -II.** Out of the three options studies, option -I has been finalized seeing less land acquisition, forest area affected, Structure affected, tree felling involve, water bodies, impact on villages, project cost, etc.

3.4 SIZE OF MAGNITUDE OF OPERATION

The proposed project is the development of access-controlled Ludhiana-Bathinda Greenfield Highway, starts at Delhi-Katra Expressway of NE 5 (at Ballowal village of Ludhiana West Tahsil) and ends at Amritsar-Bathinda Greenfield Highway (near Rampura Phul Tahsil) in the state of Punjab & The Right of Way (ROW) proposed is 60 m.

3.5 PROJECT DESCRIPTION

Total length	76+290
Proposed Right of Way	60 m in general
No. of major bridges	Nil
No. of minor bridges	5
No. of culverts	27
Interchanges	2 (Km 0+000 & Km 76+290)
Fly-over	2
VUP/LVUP/SVUP	37
Vehicular Overpass	--
Way side Amenities	Type – A : 1
Toll Plaza	1 at chainage 50+594
Truck Parking	At 1 locations
Embankment	▪ Total length of embankment - 74.500 km ▪ Average height of embankment > 2.5 m
Drain	▪ Total length of unlined Open drain - 126 km ▪ Total length of Box drain – 30.0 km
Safety Measures	▪ 3 beam metal crash barriers ▪ Advanced Traffic Management System (ATMS) ▪ Signage as per IRC 67 ▪ Anti Glare Screens at Curves ▪ Required Road Markings and Studs

3.6 RAW MATERIAL REQUIRED ALONG WITH ESTIMATED QUANTITY, LIKELY SOURCE, MARKETING AREA OF FINAL PRODUCT/S, MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCT.

The material requirement during the construction phase of the project for a period of 24 months in broad view the estimated details of construction materials are elaborated below;

Sl.	Material	Source	Quantity (Cum)
1	**Aggregate**	Pathankot, Ferozpur	1,170,875
2	**Soil**	Along the alignment from agriculture land	15,616,386
3	**Cement**	Pathankot, Ferozpur	17,916
4	**Sand**	Ludhiana, Bathinda and Moga	170,836
5	**Steel**	Ludhiana, Bathinda, Moga	19,778 (MT)
6	**Water**	Surface/Ground Water	895,000 (KL)
	Fly Ash	Guru Nanak Thermal Power Plant, Bathinda	2,340,000

The highway construction will require minor minerals like stones, gravel, ordinary clay, ordinary sand, gravels, boulders, kankar, murum, brick earth, bentonite, road metals.

3.7 RESOURCE OPTIMIZATION/ RECYCLING AND REUSE ENVISAGED IN THE PROJECT, IF ANY, SHOULD BE BRIEFLY OUTLINED.

Not applicable

3.8 AVAILABILITY OF WATER ITS SOURCE, ENERGY/ POWER REQUIREMENT AND SOURCE SHOULD BE GIVEN

Water: Water will be procured from nearby available sources both (Ground water & Surface water). Details will be furnished in EIA report.

Power: (LSD) D.G sets shall be used for power for onsite construction sites, wherever grid power supplies is not available.

3.9 QUANTITY OF WASTES TO BE GENERATED (LIQUID AND SOLID) AND SCHEME FOR THEIR MANAGEMENT/ DISPOSAL

Wastes generated within the site would be of food items, paint containers/other container, grit, bitumen, tar, cement, concrete, oil & grease etc. Waste shall be segregated and collected in separate bins and disposed off according to MoEF&CC/ CPCB regulations. Kitchen waste/ other biodegradable waste generated in construction camp will be disposed off in waste disposal pit within camp area.

3.10 SCHEMATIC REPRESENTATION OF THE FEASIBILITY DRAWING WHICH GIVE INFORMATION OF EIA PURPOSE

As per the EIA notification dated 14th September, 2006 under EPA Act 1986, it is mandatory for the proposed activity to get Environmental Clearance (EC) before setting up any project or expansion/modernization of any project. The details delineating the process is given below:

Environmental Impact Assessment (EIA) is a well-planned process to predict the environmental consequences of any kind of development, which is a result of human activities and to suggest appropriate measures in order to reduce adverse effects and also to augment positive effects. The EIA procures a rational and ethical approach for sustainable development. However, it is more scientific process because it not only tells the past, present and the future consequences of on-going developments, but also predicts the future events which are likely to change due to various reasons.

In terms of the EIA notification of the MoEF&CC dated 14th September 2006, the generic structure of EIA documents shall be as under: -

- Introduction
- Project Description
- Analysis of Alternatives (Technology & Site)
- Description of the Baseline Environment
- Anticipated Environmental Impact & mitigation Measures
- Environmental Monitoring Programme
- Risk Assessment And Disaster Management Plan
- Social Impact Assessment and R& R Plan
- Environmental Management Plan (EMP)
- Project Benefits
- Public Hearing
- Summary & Conclusion
- Disclosure of Consultant Engaged

4 SITE ANALYSIS

4.1 CONNECTIVITY

This alignment has important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the

freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana.

The general land use pattern is agriculture. Some of the habitant villages are developed along the project route.

The area falling under the proposed Right of Way (ROW) of 60 m of proposed Greenfield Highway majorly passes through agricultural land. Hence there will be permanent change in the land use from agricultural to non-agricultural land and some existing crossing road/canal side protected forest land to non-forest land. Details of Land use breakup will be described in EIA-EMP report.

4.2 TOPOGRAPHY

Most of the project road passes through mainly plain terrain with an elevation varies from about 216 m to 247 m above MSL.

4.3 EXISTING LAND USE PATTERN (AGRICULTURE, NON-AGRICULTURE, FOREST, WATER BODIES (INCLUDING AREA UNDER CRZ), SHORTEST DISTANCES FROM THE PERIPHERY OF THE PROJECT TO PERIPHERY OF THE FORESTS, NATIONAL PARK, WILDLIFE SANCTUARY, ECO-SENSITIVE AREAS, WATER BODIES (DISTANCE FROM THE HFL OF THE RIVER), CRZ. IN CASE OF NOTIFIED INDUSTRIAL AREA, A COPY OF THE GAZETTE NOTIFICATION SHOULD BE GIVEN.

Entire project road traverse on plain terrain in Punjab, other than road side plantation on cross road/canal which is notified PF land there is no forest or wildlife area exist on along the project road within 10 km radius.

There are few village ponds along the project road. Also, the road alignment cross large/medium irrigation canal at some locations including Sirhind Canal.

4.4 EXISTING INFRASTRUCTURE

Majority of the alignment traverse through agricultural areas and some section have forest either side of existing road which is crossed by this project road.

As the project road is a greenfield alignment, there, is no existing infrastructure on/along project road. However, some utility like, HT line at 15 location crossing the project road.

4.5 SOIL CLASSIFICATION

There are different kinds of soils across the state i.e. loam soil, sandy loam, sandy soil, alluvial soil, saline and alkaline clay loam etc.

4.6 CLIMATIC DATA FROM SECONDARY SOURCES

Proposed alignment of road passing through these districts.

Ludhiana District:

Temperatures increase rapidly after February. June is generally the hottest month. Hot and scorching dust-laden winds blow during summer season and on individual days the day temperature may reach above 45^0C. With the onset of monsoon in early July there is appreciable drop in the day temperatures but the night temperatures are nearly as high as the day temperatures. Due to the presence of increased moisture the weather is sultry and humid and the days are quite uncomfortable. After about mid-September the night temperatures drop appreciably but in the day the temperature does not decrease rapidly. From about November, however, both the day and night temperatures decrease rapidly till January, which is the coldest month. Rains are experienced in the months of January and February due to western disturbances, which cause appreciable drop in temperature *(Source:- Census of India 2011)*

Barnala District:

The Climate on the whole remains dry in the district. Temperature starts rising from middle of February and increases rapidly from the beginning of March and touches the maximum in May and June hovering to 45°C. The heat during summer is intense and hot dust laden winds which blow during afternoon add more to the discomfort. The south-west monsoon season begins in July till the first week of September. The nights are however, warm during the monsoon and in the summer, due to the increased moisture in the monsoon weather becomes humid and unbearable. At the end of monsoon i.e. early in September the day temperature remains almost same as in the Monsoon but night starts becoming cool and pleasant. From October onwards, a rapid drop noticed in the temperature and generally January becomes the coldest month with a maximum temperature around 18°C to 19°C and minimum 4°C to 5°C. During cold season, the district is affected by the cold waves in the rear of passing western disturbances and minimum temperature drops down sharply to a one degree or to two below the freezing point of water. Fog are common during the cold season. It is however, noteworthy here that with the passage of time and fast changes in the ecological balance, there has been a tremendous change in the form of weather circle, may be summer which has become quite hot and scorching, torrential and incessant rains in rainy season and extreme and biting cold in the winter season *(Source:- Census of India 2011)*.

Bathinda District:

The climate, on the whole, is dry in the district. Temperatures start rising from

middle of February and increase rapidly from the beginning of March till June, which normally is the hottest month of the season. The temperature occasionally touches 47°C and scorching dust-laden winds; commonly known as loo, blow during the hot season. The temperature drops considerably with the onset of monsoon in early July, although the nights continue to be quite warm. Due to increased humidity in the monsoon period, the weather is oppressive during rains.

Based on the climatic conditions in the district, the year may be divided into four seasons. November to March is the cold season, which is followed by the hot season lasting up to the end of June. The period from July to mid September constitutes the rainy season commonly known as the period of southwest monsoon. The second half of September and October is termed as the period of post monsoon. January is the coldest and June, the hottest month. The period from November to February is cold; in winter, light frost or rains may be experienced. In March weather becomes fine *(Source:- Census Of India 2011)*.

SOCIAL INFRASTRUCTURE

This existing road alignment passés through mostly rural area of districts- Ludhiana, Barnala and Bathinda.

The basic social infrastructure of settlement along the project road is moderately developed along the route. The settlements along the project road have primary health care facilities, basic education and access to market and also connected to main road (MDR/ODR/PMGSY Roads).

5 PLANNING BRIEF:

5.1 PLANNING CONCEPT (TYPE OF INDUSTRIES, FACILITIES TRANSPORTATION ETC.) TOWN AND COUNTRY PLANNING/ DEVELOPMENT AUTHORITY CLASSIFICATION

Not Applicable

5.2 POPULATION PROJECTION

Not Applicable

5.3 LAND USE PLANNING (BREAKUP ALONG WITH GREEN BELT ETC.)

Land use change is likely as proposed road width will be 60-meter-wide and 76+290 km long green filed highway. A total 457.74 hectare of land will be required for development of project road. Out of these 457.74 hectares, 9 hectare is protected forest land. The exact details of land requirement (including type of land) will be given in EIA report.

5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

Not Applicable

5.5 AMENITIES / FACILITIES

The amenities proposed during operation phase are toll plaza, administrative buildings, weighing stations, parking areas & rest areas and office for maintenance and operation. Toll plaza location will be selected based on the traffic studies and a study of the existing physical features including the availability of land & designed as per IRC.

6 PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA (PROCESSING AREA):

Not Applicable

6.2 RESIDENTIAL AREA (NON-PROCESSING AREA)

Not Applicable

6.3 GREEN BELT

Avenue plantation shall be provided as per Green Highway (Plantation and Maintenance) policy and Green Highways (Plantation Trans-plantation beautification and Maintenance) policy 2015. About 10 km width (both side) has been kept for Greenbelt and utility.

6.4 SOCIAL INFRASTRUCTURE

Not Applicable

6.5 CONNECTIVITY

This alignment has important connectivity between NE 5 of Delhi-Katra Expressway and Amritsar-Bathinda Greenfield Highway to accommodate the freight traffic of the country. This highway connecting NH-95, NH-44 (old NH-1), NE 5, NH-71 and terminating at Amritsar-Bathinda Greenfield Highway. There is no direct connectivity to the Bathinda from Ludhiana.

6.6 DRINKING WATER MANAGEMENT (SOURCE AND SUPPLY OF WATER)

Drinking water will be extracted from either existing borewell or new borewell with approval of competent authority. Details will be furnished in EIA report.

6.7 SEWERAGE SYSTEM

Mobile toilets with package STP will be provided for the workers at major construction site. Toilets with septic tank shall be provided in worker camp.

During operation phase, at toll plaza and office, the amenities area. Toilet with STB or septic tank will be provided. Details will be furnished in EIA report.

6.8 INDUSTRIAL WASTE MANAGEMENT

In construction yard Likely hazardous material used and produced in highway construction work are batteries, fuse tubes, paint containers which will be handled as per buy back policy. Other hazardous material like Furnish oil, spent oil, used engine oil, stored and resold to authorized vender for safe disposal. Adequate construction safety measures.

6.9 SOLID WASTE MANAGEMENT

Approx. 500 workers and staff will be engaged at a time. Out of these 500 workers/staff, about 30% will be local. Remaining 350 workers/staff will contribute in domestic waste generation at project site. Per capita average municipal waste generation is 450 grams; accordingly, 157.5 kg/per day municipal waste is expected to be generated. In a construction period of 2 year (730 days), the quantity of municipal waste likely to be generated is 114975.0 kg. During operation phase, the municipal solid waste generated from the amenities proposed along the alignment. Waste management during construction and operational phase shall be done as per Solid Waste Management Rules, 2016 and their amendments as on date.

6.10 POWER REQUIREMENT AND SUPPLY / SOURCE

Power requirement during construction phase will be met with D.G sets (low sulfur fuel) in case of non-availability of electric supply. For operational phase, electrical supply will be used wherever available.

7 REHABILITATION AND RESETTLEMENT (R & R) PLAN:

7.1 POLICY TO BE ADOPTED (CENTRAL/STATE) IN RESPECT OF THE PROJECT AFFECTED PERSONS INCLUDING HOME OUSTEES, LAND OUSTEES AND LANDLESS LABORERS (A BRIEF OUTLINE TO BE GIVEN)

Most of the land coming under the project area is agricultural land except some protected forest land which will be converted into project highway. The required land will be acquired by NHAI before the commencement of construction work and the R&R plan will be prepared and will be submitted in EIA-EMP report.

8 PROJECT SCHEDULE & COST ESTIMATES

8.1 LIKELY DATE OF START OF CONSTRUCTION AND LIKELY DATE OF COMPLETION:

The project shall start its construction work as and when DPR is finalized and will get Environmental clearance from MoEF&CC along with other statutory clearances. The completion period of the project construction is estimated about 24 months. The anticipated period of completion is in the year 2022.

8.2 ESTIMATED PROJECT COST ALONG WITH ANALYSIS IN TERMS OF ECONOMIC VIABILITY OF THE PROJECT.

The estimated civil cost of the project excluding land acquisition cost is approximately Rs. 1716.17 Crores.

9 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

9.1 FINANCIAL AND SOCIAL BENEFITS WITH SPECIAL EMPHASIS ON THE BENEFIT TO THE LOCAL PEOPLE INCLUDING TRIBAL POPULATION, IF ANY, IN THE AREA.

The project will have multiple benefits. It will improve efficiency of freight movement to Delhi, Haryana, Rajasthan and Punjab. Overall improvement will be expected in local area in following ways:

- Development and improvement in transportation infrastructure facility will connect villages with the nearby cities
- Better approach to Medical & Educational services and quick transportation of perishable goods like fruits, vegetables and dairy products.
- Development of tourism and pilgrimage.
- Transporting, processing and marketing of agricultural products.
- Fast and safe connectivity resulting in savings in fuel, travel time and total transportation cost to the society.
- Reduction in pollution due to reduction in congestion
- Indirect and direct employment opportunity to people from all skilled, semiskilled and unskilled streams will act as social benefits.
- It is assumed that the overall Bharatmala project will boost socio-economic development in the entire central region of Delhi, Haryana, Rajasthan & Punjab.

<u>Recommendation for Section-1:</u>

After comparative study it is concluded that option-1 between Ludhiana & Bathinda with length 76.290 km and cost 1716.17 crores. Further, keeping in view of Environmental loss, minimum tree cutting, minimum forest land diversion, least R&R activity/structure loss, option-1 is recommended despite having low cost.

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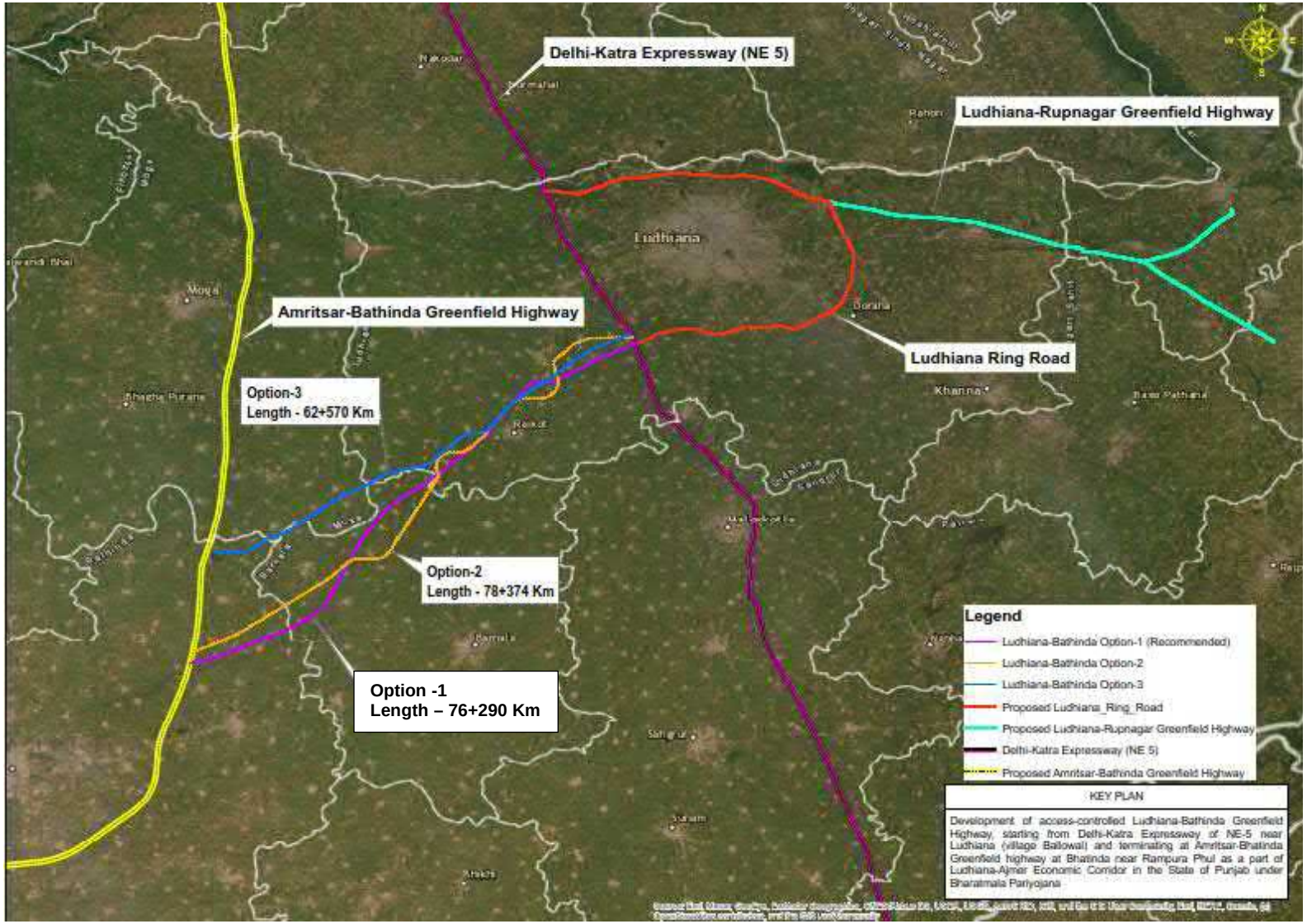
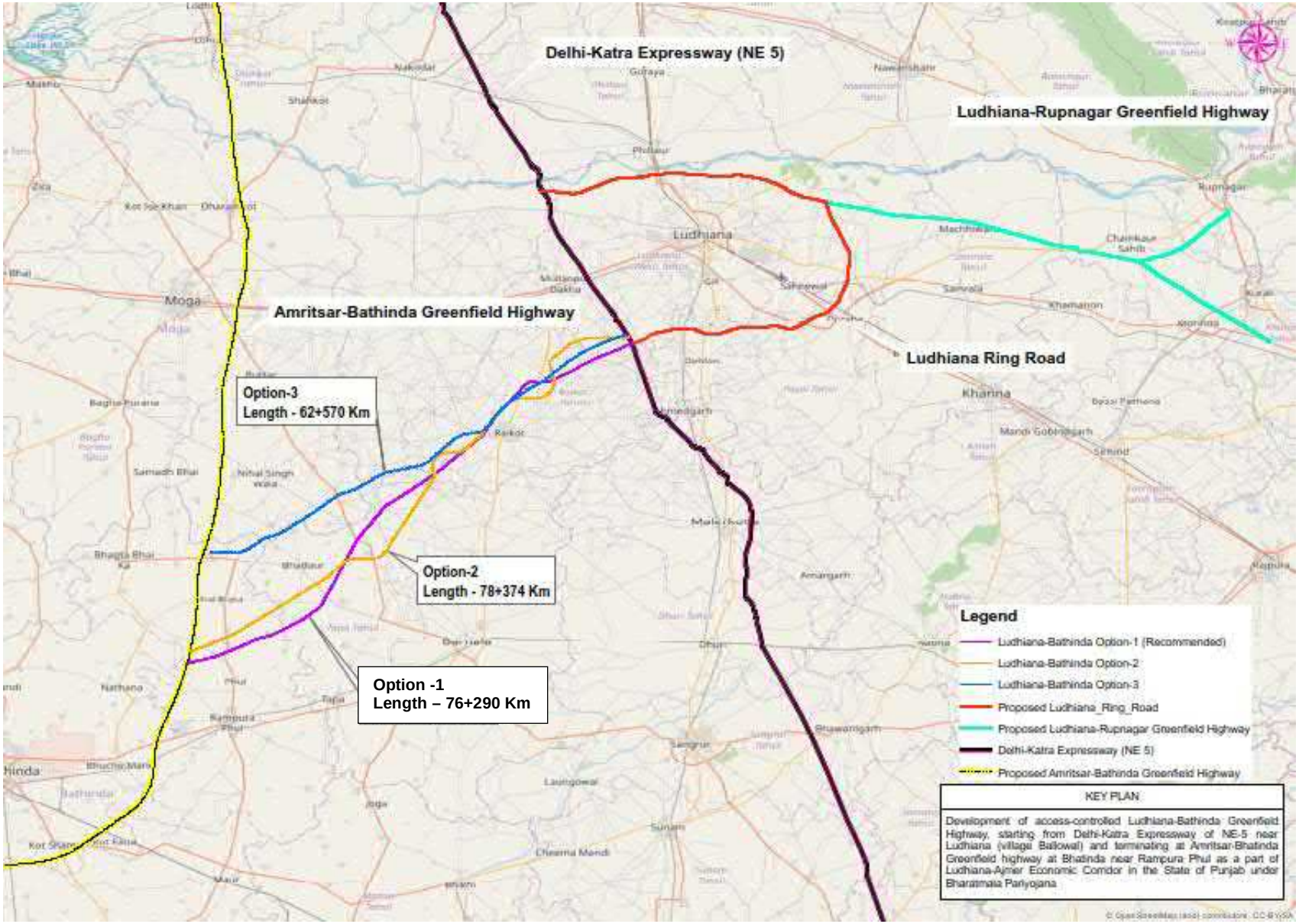
ANNEXURE-1:- Alternative Option Map




Delhi-Katra Expressway (NE 5)
Ludhiana-Rupnagar Greenfield Highway
Amritsar-Bathinda Greenfield Highway
Ludhiana Ring Road
Option-3
Length - 62+570 Km
Option-2
Length - 78+374 Km
Option -1
Length – 76+290 Km
Legend
Ludhiana-Bathinda Option-1 (Recommended)
Ludhiana-Bathinda Option-2
Ludhiana-Bathinda Option-3
Proposed Ludhiana_Ring_Road
Proposed Ludhiana-Rupnagar Greenfield Highway
Delhi-Katra Expressway (NE 5)
Proposed Amritsar-Bathinda Greenfield Highway
KEY PLAN
Development of access-controlled Ludhiana-Bathinda Greenfield Highway, starting from Delhi-Katra Expressway of NE-5 near Ludhiana (village Ballowal) and terminating at Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the State of Punjab under Bharatmala Pariyojana

Annexure -II: Analysis of Alternative (Options Study) for Proposed Greenfield Highway Projects

SN	Criteria	Alternatives		
		Option 1	Option 2	Option 3
A	**General Alignment Perspective**			
1	Alignment start point (location name)	Ballowal (Ludhiana West)	Ballowal (Ludhiana West)	Ballowal (Ludhiana West)
2	Alignment start point (chainage)	Km 0.000	Km 0.000	Km 0.000
3	Alignment end point (location name)	Bhaini (Rampura Phul)	Sailbrah (Rampura Phul)	Dyalpura Bhaika (Rampura Phul)
4	Alignment end point (chainage name)	Km 76+290	Km 78+374	Km 62+570
5	Total length of the alignment (km)	Km 76+290	Km 78+374	Km 62+570
B	**Environmental Perspective**			
1	Terrain nature	Plain	Plain	Plain
2	No of water bodies, wetland etc. with distance	Major River – Nil Nala - Nil Ponds – Nil Drain - 3	Major River – Nil Nala - Nil Ponds – 4 Drain - 3	Major River – Nil Nala - Nil Ponds – 7 Drain - 3
3	Details of irrigation canal crossings	Major Canal – Nil Minor Canal – 21 Distributory Canal - 5	Major Canal – 2 Minor Canal – 19 Distributory Canal - 4	Major Canal – 1 Minor Canal – 17 Distributory Canal - 6
4	Details of cultivated land along the corridor	All Agriculture field	All Agriculture field	All Agriculture field
5	Details number of cattle crossing pathway	@500m	@500m	@500m
6	Protected Forest and Reserve forest (Ha.)	Protected Forest 9 ha Approx. along irrigation canal, railways line, roads, bunds etc	Protected Forest 12 ha Approx. along irrigation canal, railways line, roads, bunds etc	Protected Forest 13 ha Approx. along irrigation canal, railways line, roads bunds
7	No of Environmental Sensitive Zone, WLS etc	Not Applicable	Not Applicable	Not Applicable
8	Major flora details and its nature	Prosopis juliflora), Shisham (Dalbergia sissoo), Kikar (Acacia Nilotica), Beri (Zizyphus mauritiana), Amb (Mangifera indica), Jamun (Syzygium cumini), Neem	Kikar (Acacia Nilotica), Beri (Zizyphus mauritiana), Drek (Melia azadirachta), Khajoor (Phoenix sylvestris), Prosopis juliflora), Shisham	Shisham (Dalbergia sissoo), Kikar (Acacia Nilotica), Jand (Prosopis cineraria), Mesquite (Prosopis juliflora), Siris (Albizzia sp.), Dholi , Nara

SN	Criteria	Alternatives		
		Option 1	**Option 2**	**Option 3**
		(Azadirachata indica), Drek (Melia azadirachta), Khajoor (Phoenix sylvestris), Lasura (Cordia myxa), Teak (Tectona grandis), Eucalyptus,.	(Dalbergia sissoo), Amb (Mangifera indica), Jamun (Syzygium cumini), Neem (Azadirachata indica), Lasura (Cordia myxa), Teak (Tectona grandis), Eucalyptus,.	(Arundinaria falcata), Palwan (Dichanthium annulatum), Sariala (Heteropogon contortis), Beri (Zizyphus mauritiana), Jamun (Syzygium cumini), Neem (Azadirachata indica), Simbal (Bombex ceiba), Phalahi, Arjun (Terminalia arjuna), Mesquite, Sarkanda, Toon (Toona ciliata), Dhak (Butea monosperma) , Karir(Capparis aphylla), Karonda (Carissa karanda). etc.
9	Tentative no of trees in forest area (both fruit bearing & non fruit bearing)	Fruit-19 Non Fruit-1038	Fruit-57 Non Fruit-1261	Fruit-43 Non Fruit-1189
10	Tentative no of trees in non- forest area (both fruit bearing & non fruit bearing)	Fruit-39 Non-Fruit-461	Fruit-290 Non-Fruit-587	Fruit-210 Non-Fruit-742
11	Major fauna details, animal species etc.	Mostly domesticated animals	Mostly domesticated animals	Deers, sambar, monkey and scheduled – 1 birds.
C	**Socio-economic Perspective**			
1	Population displacement requirement			
2	Predominant existing land use pattern	Agriculture	Agriculture	Agriculture
3	Socio-economic activities/livelihood	Agriculture	Agriculture	Agriculture
4	No of entities with religious importance	NIL	Nil	Nil
5	No of human settlements, villages etc.	36	39	35
6	Private land to be acquired	448.74 Hectare	505 Hectare	397 Hectare
7	No of entities with heritage or archaeological importance	NA	NA	NA
D	**Design and Engineering perspective**			
1	No of structures to be destroyed	37	69	187
2	No of railway crossing	Nil	Nil	Nil

SN	Criteria	Alternatives		
		Option 1	**Option 2**	**Option 3**
3	No of highway or major road crossing	1 NH, 2 SH, PWD Roads 34	1 NH, 2 SH, PWD Roads 36	1 NH, 2 SH, PWD Roads 28
4	No of flyover, underpass, ROB	Flyover (2), Underpass 37, ROB-Nil	Flyover (2), Underpass 39, ROB-Nil	Flyover (2), Underpass 31, ROB-Nil
6	Geometric nature of alignment (no of major bends, horizontal/vertical profiling)	Plain and Straight	Plain and Straight	Plain and Straight
7	Need for any at grade junction improvement	NA	NA	NA
8	Availability of RoW	Fully Greenfield	Fully Greenfield	Fully Greenfield
9	Utility shifting requirement	Only Electric Lines	Only Electric Lines	Only Electric Lines
10	Civil Construction Cost (in Crores)	1716.17	1842.90	1833.20
11	LA and R&R Cost (in Crores)	182.72	234.20	256.50
12	Total Capital Cost (in Crores)	1898.89	2077.10	2089.70
E	**FINAL OPTION SELECTED**	**OPTION No – 1**		

Development of access controlled Ludhiana-Bhatinda Greenfield highway starting from Delhi-Katra Expressway (NE-5) near Ludhiana (village Ballowal) and terminating on Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the state of Punjab under Bharatmala Pariyojana

Scoring Criteria	Total Weight	Option-1	Option-2	Option-3		
		Score	Score	Score		
Natural Environment	80	14	20	25		
Biological Environment	80	5	5	5		
Physical Environment	50	-	-	-		
Social Environment	60	20	21	29		
Engineering	130	69	88	93		
Total	400	108	134	152		
		Recommended				

Score out of 360	Score Limit (%)	Impact Category
Less than 120	<30	Low
120 to 200	30 – 50	Medium
200 to 320	50-80	High
More than 320	>80	Very High

Natural Environment

Attributes	Scoring Criteria		Score	Total Weight of Attribute	Option-1 Score	Option-2 Score	Option-3 Score
Topography	Plains	-	0	10	0	0	0
	Rolling terrain	-	5				
	Flood plains/coastal belt	-	10				
	Hilly/mountainous terrain	Upto 100% of Project Length	10	10	0	0	0
		Upto 50% of Project Length	5				
		Upto 25% of Project Length	1				
		Nil	0				
	CRZ Area	CRZ -I	10	10	0	0	0
		CRZ -III	5				
		CRZ -III/IV	1				
		Nil	0				
Vulnerability to natural hazards (as earthquakes, floods, landslides, Tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes etc.)	Not prone to any Hazard	-	0	5	1	1	1
	Rare occurrence	-	1				
	Prone to natural disasters/risks	-	3				
	Highly prone to natural disasters (regular occurrence)	-	5				
Surface water resources	Number (average) of water bodies per km (rivers, canals, reservoirs, lakes and ponds) – Crossings as well as water bodies within RoW.	5 or less	1	5	3	3	3
		6 to 10	2				
		11 to 15	3				
		16 to 20	4				
		21 or more	5				
Affected Surface Area of Water bodies	Reservoir/Lake/Pond	>1 ha.	10	10	0	5	10
		Upto 0.5 ha.	5				
		Upto 0.1 ha.	1				
		if No	0				
	Canal/River/Stream	>3 ha.	10	10	5	5	5
		Upto 1.5 ha.	5				
		Upto 0.3 ha.	1				
		if No	0				
Drainage Conditions	Over-topping and/or water logging within RoW (average number of such instances per km)	2 or less	1	5	1	2	2
		3 to 4	2				
		5 to 6	3				
		6 to 7	4				
		7 or more	5				
Ground water resources	Availablity/Grey/Black	Available	1	5	1	1	1
		Grey	3				
		Black	5				
Materials Availability	Availability of Boulder/Sand/Earth	Within 50 km	1	5	3	3	3
		50 to 100 km	2				
		100 to 200 km	3				
		More than 200 km	5				
Soil Erosion	Is soil erosion an issue in/along the sub-project road?	No Errosion	0	5	0	0	0
		To some extent	1				
		Critical	3				
		Very critical	5				
Total		-		80	14	20	25

Biological Environment

Attributes	Scoring Criteria		Score	Total Weight of Attribute	Option-1 Score	Option-2 Score	Option-3 Score
Protected Areas (PA) under Wildlife Conservation Act	National Park	-	10	10	0	0	0
	Tiger Habitat	-	10				
	Wildlife Sanctuary/Marine Sanctuary	-	8				
	Conservation Reserve/Biosphere, Wetland	-	6				
	Projects Falls within 10Km Boundary of PA/ Wildlife Corridor in other type of Forests Area	-	2				
	None	-	0				
Forests Area	Reserved Forest	upto 20 ha	1	10	1	1	1
		upto 40ha	2				
		upto 50 ha	4				
		upto 60 ha	6				
		upt0100 ha	8				
		More than 100 ha	10				
	Protected Forest	upto 20 ha	1	10	1	1	1
		upto 40ha	2				
		upto 50 ha	4				
		upto 60 ha	6				
		upt0100 ha	8				
		More than 100 ha	10				
	Forest Type Area (FCA Applicable), Forest Type Area (FCA Applicable), Goverrntment Land Notified under FCA Act as Protected Forest for Management Purpose	upto 20 ha	1	10	1	1	1
		upto 40ha	2				
		upto 50 ha	4				
		upto 60 ha	6				
		upt0100 ha	8				
		More than 100 ha	10				
Trees	Felling of trees from forest area	Upto 100 Trees/Km	1	10	1	1	1
		Upto 200 Trees/Km	2				
		Upto 300 Trees/Km	4				
		Upto 400 Trees/Km	6				
		More than 500 Trees/Km	8				
		More than 1000 Trees/Km	10				
	Local Law applicable for felling of trees Non Forest Land	50 Trees/Km	1	10	1	1	1
		100 Trees/Km	2				
		200 Trees/Km	4				
		Upto 300 Trees/ Km	6				
		Upto 400 Trees/ Km	8				
		More than 500 Trees/Km	10				
Mangroves	Area	No CRZ	0	10	0	0	0
		upto 2 ha.	2				
		upto 5ha	5				
		More than 10 ha	10				
	No of Mangroves	upto 50 ha	2	10	0	0	0
		Upto 100 ha	5				
		More than 200 ha	10				
Total	-	-	-	80	5	5	5

Physical Environment							
Attributes	Scoring Criteria		Score	Total Weight of Attribute	Option-1	Option-2	Option-3
					Score	Score	Score
Air Quality	Respirable PM10	More than Permissible limit i.e. 100 µg/m3	5	5	-	-	-
		Upto 50 µg/m3	2				
		Upto 20 µg/m3	0				
	Respirable PM 2.5	More than Permissible limit i.e. 60 µg/m3	5	5	-	-	-
		Upto 30 µg/m3	2				
		Upto 10 µg/m3	0				
	SO2/Nox	More than Permissible limit i.e. 80 µg/m3	5	5	-	-	-
		Upto 40 µg/m3	2				
		Upto 20 µg/m3	0				
	CO (1 Hr. Monitoring)	More than Permissible limit i.e. 4000 µg/m3	5	5	-	-	-
		Upto 2000 µg/m3	2				
		Upto 1000 µµ/m3	0				
	CO (8 Hr. Monitoring)	More than Permissible limit i.e. 2000 µg/m3	5	5	-	-	-
		Upto 1000 µg/m3	2				
		Upto 250 µ+C43/m3	0				
Ground Water	Limit as per IS 10500:2012	If 4 Parameters are above desirable limit	5	5	-	-	-
		If 2 Parameters are above desirable limit	2				
		All within Permissible Limit	0				
Surface Water	Limits as per IS:2296 Class C Limits	If 4 Parameters are above desirable limit	5	5	-	-	-
		If 2 Parameters are above desirable limit	2				
		All within Permissible Limit	0				
Noise	Day Time (Ambient Noise) in Residential/Commercial/Silent (Noise Level in dB (A) for continuous 24 hours at 1 hour interval)	More than Permissible Limit i.e.65dB	5	5	-	-	-
		Upto 50% of Permissible Limit i.e.32dB	2				
		Upto less than 50 % of Permissible Limit	0				
	Night Time (Ambient Noise) in Residential/Commercial/Silent (Noise Level in dB (A) for continuous 24 hours at 1 hour interval)	More than Permissible Limit i.e.55dB	5	5	-	-	-
		Upto 50% of Permissible Limit i.e.27dB	2				
		Upto less than 50 % of Permissible Limit	0				
Soil		Saline/Highly Alkaline/Highly Acidic	5	5	-	-	-
		Moderate	2				
		Within 50% of Permissible Limit	0				
Total	-	-		50	-	-	-

The details shall be collected during the baseline assessment

Social Environment							
Attributes	Scoring Criteria		Score	Total Weight of Attribute	Option-1 Score	Option-2 Score	Option-3 Score
People	No of Families Affected/Km	>25	5	5	1	2	5
		Upto 10	2				
		<5	1				
Agriculture	Affectected Area/Km	>2 ha.	10	10	10	10	10
		Upto 1 ha.	5				
		Upto 0.2 ha.	1				
		if No	0				
Settlements	Total length of settlement sections (both towns and villages) abutting the road corridor	10 km or less	2	10	2	2	2
		10 to 20 km	4				
		20 to 30 km	6				
		30 to 40 km	8				
		40 km or more	10				
Sensitive Receptors	Number (total) of sensitive receptors within RoW (such as educational and health facilities)	10 or less	1	5	1	1	2
		11 to 20	2				
		21 to 30	3				
		31 to 40	4				
		41 or more	5				
Drinking water sources	Total number of drinking water sources (wells, hand pumps, community water points/taps etc.) with in RoW	10 or less	1	5	1	1	2
		11 to 20	2				
		21 to 30	3				
		31 to 40	4				
		41 or more	5				
Religious Structures	Number (total) of religious structures (temples, shrines, mosque, church, gurudwara) with in RoW	10 or less	1	5	1	1	1
		11 to 20	2				
		21 to 30	3				
		31 to 40	4				
		41 or more	5				
Cultural Heritage Site	Number (total) of cultural properties (protected/ unprotected archeological monuments) within RoW.	2 or less	1	5	1	1	1
		3 to 5	2				
		6 to 8	3				
		8 to 10	4				
		More than 10	5				
Market Places	Number (total) of weekly market places/haats ; grain/fruit/ vegetable/ fish market; cattle market	5 or less	1	5	1	1	2
		6 to 10	2				
		11 to 15	3				
		16 to 20	4				
		21 or more	5				
Common Property Resources	Number (total) of CPRs (such as pastures/gauchar lands; seating areas of the community; cremation/burial grounds etc.) within/along the RoW	5 or less	2	10	2	2	4
		6 to 10	4				
		11 to 15	6				
		16 to 20	8				
		21 or more	10				
Total	-	-	-	60	20	21	29

Engineering Aspect							
Attributes	Scoring Criteria		Score	Total Weight of Attribute	Option-1 Score	Option-2 Score	Option-3 Score
Road Length, (Km)	Total length of the Road	10 km or less	3	15	15	15	15
		10 to 20 km	6				
		20 to 30 km	9				
		30 to 40 km	12				
		40 km or more	15				
Geometrical Elements	Horizontal and Vertical (Curvature)	Nil	0	15	9	15	15
		5 or less	3				
		6 to 10	6				
		11 to 15	9				
		16 to 20	12				
		21 or more	15				
Road Safety		High	5	15	5	5	5
		Moderate	10				
		Low	15				
Operational	Connectivity / Access	Better	5	10	5	7	7
		Moderate	7				
		Low	10				
Construction Time		<30 Months	5	10	5	5	5
		up to 36	7				
		>36 Months	10				
Muck/blasting/ disposal	Cutting/ drilling/ blasting / Disposal	Low	1	5	1	3	3
		Moderate	3				
		High	5				
Underpass (No.)	VUP/LVUP/SVUP	10 or less	4	10	10	10	10
		11 to 20	6				
		21 to 30	8				
		31 or more	10				
Interchange	Number (total) of Road Junctions	10 or less	2	10	2	4	4
		11 to 20	4				
		21 to 30	6				
		31 or more	8				
Railway Crossing	Number (total) of RUB/ROB/At Grade	Nil	0	10	0	0	0
		2 or less	4				
		3 to 4	6				
		5 to 7	8				
		8 or more	10				
Major Bridge	Number (total) of Bridges incl. bridges on Water Bodies	2 or less	4	10	4	6	8
		3 to 5	6				
		6 to 8	8				
		More than 8	10				
Minor Bridge	Number (total) of Bridges incl. bridges on Water Bodies	5 or less	4	10	6	8	10
		6 to 10	6				
		11 to 15	8				
		15 or more	10				
Total Cost of Structures	Civil Cost (Crores)	Upto 300	2	5	2	2	2
		300 to 600	3				
		600 to 1000	4				
		1000 or more	5				
Total Construction Cost	Civil Cost (Crores)	Upto 500	2	5	5	5	5
		500 to 1000	3				
		1000 to 1500	4				
		1500 or more	5				
Total	-	-	-	130	69	88	93

Alignment on Toposheet Map
Proposed Ludhiana-Bathinda Greenfield Highway

N
W E
S

Delhi-Katra Expressway (NE 5)

Amritsar-Bathinda Greenfield Highway

Option-3
Length- 62+570 Km

Option-2
Length- 78+374 Km

Option-1
Length- 76+290 Km

Development of access controlled Ludhiana-Bhatinda Greenfield highway starting from Delhi-Katra Expressway (NE-5) near Ludhiana (village Ballowal) and terminating on Amritsar-Bhatinda Greenfield highway at Bhatinda near Rampura Phul as a part of Ludhiana-Ajmer Economic Corridor in the state of Punjab under Bharatmala Pariyojana (Total Length = 76+290 Km)

Legend

- Alignment_Option-1 (Recommended)
- Alignment_Option-2
- Alignment_Option-3
- Amritsar-Bathinda_Greenfield Highway
- Delhi-Katra_Expressway (NE 5)