HARYANA ORBITAL RAIL CORRIDOR CONNECTING PALWAL TO SONIPAT
BY LINKING ASAOTI-PATLI-ASAUDAH-RATDHANA STATIONS
FEASIBILITY STUDY REPORT

Haryana Rail Infrastructure Development Corporation Limited
A Joint Venture Company of Ministry of Railway and Govt. of Haryana

FEASIBILITY STUDY REPORT
FEB-2019

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BY LINKING ASAOTI-PATLI-ASAUDAH-RATDHANA STATIONS

aarvee associates
architects engineers & consultants pvt. ltd.
An ISO 9001:2008 Certified Company
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1 EXECUTIVE SUMMARY

1.1 Introduction

Haryana Rail Infrastructure Development Corporation Limited (HRIDC) was incorporated on 22nd August 2017 as a Joint Venture with Government of Haryana and Ministry of Railways with equity participation of 51% and 49% respectively. The Company has a mandate of selecting bankable railway projects for development, study, arranging finance, execution of Projects and to boost the Rail infrastructure projects in the state of Haryana on the principle of cooperative federalism.

The Company intends to develop many common user rail corridors to open unserved areas of the State of Haryana, thereby, for easing out the Delhi region from the freight traffic movement passing through and by allowing shifting from radial and inner ring rail network.

The Regional Orbital Rail Corridor was conceived by NCR as a Ring Railway around Delhi at about 200KM radius.

There was proposal to connect Palwal- Manesar- Patli- Farukhnagar- Jhajjar to make a Western Peripheral Rail Corridor to connect Palwal to Panipat bypassing Delhi.

After Implementation of KMP Expressway and the planning of Panchgram Urban centres, the project alignment from Palwal to Sonipat has been conceived on Techno-Economic consideration.

The proposed Rail corridor will facilitate the diversion of Freight traffic not meant for Delhi and will help in developing Multi Modal Hubs in NCR region of Haryana.

This study pertains to new electrified Double BG rail line project from Pawal to Sonipat bypassing Delhi region and will provide direct rail connectivity (by-passing Delhi) from Palwal to Sonipat by linking Asaoti (on Delhi-Mathura Route)-Patli (on Delhi Rewari Route)-Asaudha(on Delhi-Rohtak Route) and Harsana Kalan (on Delhi-Ambala Route) by new Broad Gauge rail line and also with DFC network at Pirthala.

1.2 Traffic Demand Forecast

- The potential Assessed traffic that can be diverted through the proposed corridor is 40.5 GMT
- The new traffic generation points along the corridor are IMT Faridabad, Sohna, Manaesar, Rothak and SEZ at Farukhnagar.
- Traffic from Maruti Suzuki is 600 Rakes per year
• CONCOR and all other ICD’s proposed 5 GMT in 2023
• Anticipated passenger traffic is 24000 per day for starting year

<table>
<thead>
<tr>
<th></th>
<th>2024</th>
<th>2026</th>
<th>2031</th>
<th>2036</th>
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<td>67.45</td>
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<td>47</td>
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<td>77</td>
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<td>29000</td>
<td>35000</td>
<td>42000</td>
<td>50000</td>
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</table>

1.3 Civil Engineering

The proposed route is having following sections.

• Asaoti to Harsana Kalan – 130 Km
• Y-Connectivity at Patli station towards Rewari
• Y-Connectivity at Sultanpur station towards Garhi Harsaru
• Y-Connectivity at Asaudah station towards Rohtak
• The minimum and maximum inter distance between the proposed crossing stations are 7.880 Km and 15.520 Km
• There are 3Y-Connectivity lines proposed for connecting the Radial lines coming from Delhi i.e on Delhi-Rewari, Delhi-Rohtak and GarhiHarsaru-Farukhnagar sections
• Total 50 curves are proposed in the enroute. The maximum degree of curvature considered as 5.0 degree.
• Land required for construction is 654.26 Hectares inclusive of doubling, of which 70 Hectares of land is under HSIIDC
• All the bridges on the proposed new BG line will be of 25 T Axle loading and provided with ballasted deck as per extent guidelines of Railway Board.
• Track structure is proposed with 60 Kg. 110 UTS Rails on PSC sleepers 1660 Nos per KM and 350 mm ballast cushion.

1.4 Salient Features

• Total Route Length – 130 Kms (excluding Y-Connectivities)
• Ruling Gradient - 1 in 200 Compensated
• Maximum Length of Ruling Gradient - 2635 m
• Bridges:

<table>
<thead>
<tr>
<th>Description</th>
<th>No.s</th>
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</thead>
<tbody>
<tr>
<td>Water way Bridges</td>
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</tr>
<tr>
<td>Major</td>
<td>14</td>
</tr>
<tr>
<td>Minor</td>
<td>68</td>
</tr>
<tr>
<td>Road Crossing</td>
<td></td>
</tr>
<tr>
<td>RUB</td>
<td>128</td>
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<td>ROB</td>
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</tr>
<tr>
<td>RFO</td>
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</tr>
</tbody>
</table>

• Crossing Stations- 14 Nos. crossing stations have been proposed in the corridor between Asaoti to Harsana Kalan. These are including 3 nos. Existing stations viz. Asaoti, Pirthala yard and Harsana Kalan. The average inter distance between stations is 11.70 Kms. The station locations are identified with a prime importance of village centric.

• All the crossing stations have been proposed with minimum two common loops.

1.5 Power Supply and System of Traction

• The proposed corridor between Asaoti to Harsana Kalan having a total of about 130 Route KM & Over Head Conductor Track Km of 320 TKM. The section is proposed to be electrified section.

• The corridor is proposed to be electrified with 25 KV, single phase, 50 Hz.

• TSS - Traction Substations with 2x21.6 MVA transformers have been proposed at the following locations for power supply to the sections.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Station</th>
<th>Rating</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dhulawat</td>
<td>132/27.5 kV</td>
<td>2x21.6 MVA</td>
</tr>
<tr>
<td>2</td>
<td>Mandothi</td>
<td>132/27.5 kV</td>
<td>2x21.6 MVA</td>
</tr>
</tbody>
</table>

• Over Head Equipment’s (OHE) and Supervisory Control and Data Acquisition System (SCADA) have been proposed.

• Necessary modifications to the power line crossings of 11/33Kv line have been considered.
- Electric power supply system including 220, 132 KV D/C transmission line from SEB Grid substation to TSS & modification in Grid Substation also considered.

1.6 Signalling and Telecommunication

- All stations shall be class-B type with standard –II-R interlocking having Electronic Interlocking, multi aspect LED based color light signaling, electrically operated point machine and DC track circuiting for detection of track section.
- For block working, it is proposed to provide a pair of single line block instrument along with UFSBI as per latest RDSO specification. The block instrument will be connected with 6 quad copper cables laid all along the system.
- In order to improve system reliability, the provision of integrated power supply system has been considered. This will have an added advantage of ensuring uninterrupted power supply round the clock, preventing signal going blank.
- Provision of optical fiber based communication system has been planned for complete section.

1.7 Cost Estimate

- The Cost Estimate of all components of works envisaged to be taken up for implementation has been prepared.
- The overall capital cost for Haryana Orbital Rail Corridor including land cost works out to Rs. 4086.08 Crores.

1.8 Proposed Financial Structuring

- The project may be implemented as a SPV by HRIDC with Debt-Equity ratio of 70:30 considering the total cost of project is 4086.08Cr including land, the financial results like Equity IRR is computed to 13.44% with Equity NPV of 1015.48Cr. (Ref: Para 13.6 of this report)
- The total project cost including private land that need to be acquired is 3786.08cr (Ref: Chapter-3 of this report) of which 70% debt i.e 2650.25 Cr and 30% overall equity i.e 1135.82 Cr is considered.
- Out of the total equity, proposed share of various stakeholders in equity is mentioned below:
1.9 CONCLUSION & RECOMMENDATIONS

- The project may be implemented as a SPV by HRIDC with Debt-Equity ratio of 70:30 considering the total cost of project is 4086.08 Cr including land, the financial results are looking promising with Equity IRR is computed to 13.44% with Equity NPV of 1015.48 Cr making the project financially viable.

- Further EIRR of 18.00% makes the project viable on Socio-Economic consideration also.
2 OBJECTIVE AND DESIGN METHODOLOGY

2.1 Project Objective – Haryana Orbital Rail Corridor

The objective of this study is to facilitate and develop an orbital rail corridor connecting Palwal and Sonipat with suitable Rail corridor by easing out the Delhi region from the freight traffic movement by allowing shifting from radial and inner ring rail network to the proposed corridor.

- Delhi NCR being centre acts as a Hub connecting the spokes in nearby states
- Direct connectivity for Gurugram, Faridabad, Ballabhgarh, Palwal, Manesar & Farukhnagar etc. with all the districts of Haryana
- Peripheral rail link will help in industrial growth of cities around Delhi (Sohna, Manesar, Gurugram, Jhajjar, Rohtak)
- Connectivity to Dedicated Freight Corridor (DFC) at Pirthala
- It will help in easing pressure from transport network of Delhi as traffic movements in radial will shift to peripheral
- Freight traffic not meant for Delhi will get diverted and will help in developing Multi Modal Hubs in NCR region of Haryana
- Connectivity to Maruti Suzuki and Logistic Hubs in the region.

The aim of this study is to prepare Feasibility Report along with estimates, drawings, of Civil works, GADs and drawings for Signalling arrangements, Electrification of yards, stations and other buildings in connection with construction of a new electrified BG rail line corridor between Palwal and Sonipat

2.1.1 Major Development near project location

2.1.1.1 Panchgram Yojana

The Haryana government will develop five new cities in the two km area on either side of the Kundli-Manesar-Palwal expressway and the area will be named as Panchagram. The Haryana Govt. approved the concept of the Panchagram Region and developing five cities on the Kundli-Manesar-Palwal (KMP) expressway on 50,000 hectares each side of the expressway which would cover eight districts of the State namely Sonipat, Rohtak, Jhajjar, Gurugram, Rewari, Mewat, Faridabad and Palwal.

The Industrial and Commercial Townships were being set up on 3,300 acres area in Kharkhoda, Sonipat. Similarly, Industrial Model Township has been developed on 1,400 acres in Sohna of Gurugram.
The Proposed Alignment is going parallel to Kundli-Manesar-Palwal expressway of about 95 Km so that will boost to industrial Sector in the State.

2.1.1.2 Dedicated Freight Corridor

The Indian Railways quadrilateral linking the four metropolitan cities of Delhi, Mumbai, Chennai and Howrah, commonly known as the Golden Quadrilateral; and its two diagonals (Delhi-Chennai and Mumbai-Howrah), adding up to a total route length of 10,122 km carries more than 55% of revenue earning freight traffic of IR.

Western Corridor comprising of 1483 km of a double line diesel track from JNPT to Dadri via Vadodara-Ahmedabad-Palanpur-Phulera-Rewari. In addition, a single line connection of 32km long from proposed Pirthala Junction Station (near Asaoti) to Tughlakabad is also proposed to be provided.

The Proposed rail corridor is going parallel to the Western DFCC alignment for as stretch of 15.6 Kms and crosses the Western DFCC at Proposed Pirthala Station which is showing in Figure 1.5 below.

![Proposed Alignment](image)

**Figure 2.1 Proposed Alignment crosses DFCC**

2.1.2 Conceptualisation of the Alignment.

Study on Palwal - Panipat connectivity via Jhajjar
Study has been conducted on Palwal- Panipat connectivity via Jhajjar taking off from DFCC yard at Pirthala.

The alignment was proposed to run along the DFC alignment from Pirthala Yard up to Sohna.

From Sohna the alignment will then run parallel to Kundli-Manesar-Palwal (KMP) Expressway in Sohna- Manesar-Sultanpur stretch.

It will cross Delhi- Rewari Railway line near Patli Station through Rail Fly Over (RFO) and connects to existing Patli station with a surface connection.

Near GarhiHarsaru- Farukhnagar Line, the alignment shall be diverted towards Jhajjar connecting to the Farukhnagar station and terminates at Jhajjar station on Rewari-Rohtak corridor of Northern Railway.

Rewari-Rohtak line is a Single Non-electrified line. Therefore, to cater the movement of anticipated traffic through this corridor necessitate doubling of the existing track complete up to Panipat. This being a brown field project, running parallel to already existing alignment shall be difficult. Because of the urbanization, development for new industrial hubs and sidings shall be a constraint.

Only 50% of Reserved Orbital rail corridor can be used and balance 50% need to be acquired parallel to existing alignment which is of mostly Built-up area.

After Implementation of KMP Expressway and the planning of Panchgram Urban centres, the project alignment from Palwal to Sonipat has been conceived on Techno-Economic consideration.

2.2 Project Location

2.2.1 Key Map of Project location

Haryana proposed Orbital Rail Corridor from Palwal to Sonipat by linking Asaoti – Patli – Harsana Kalan by new BG line. Total Route length of project is 130 Km (excluding Y-Connectivities). The Proposed rail corridor is bypassing Delhi which is shown in Fig. 1.3 below:
2.2.2 Serving Station:

The serving stations for the connectivity shall be

- Pirthala station on the Rewari-Dadri section of Dedicated Freight Corridor having connectivity to both Asaoti and Palwal with Y-connectivity’s.
- Patli Station on Delhi-Rewari section of Northern Railways
- Sultanpur and Farukhnagar Stations on Garhi Harsaru- Farukhnagar section
- Asaudah Station on Delhi -Rohtak section of Northern Railways

2.2.3 Major Locations & Districts

The proposed alignment of 130Km (excluding Y-Connectivities) route length passes through 11 no. of proposed station locations and connecting to 3 no. of existing station
locations. The Proposed line runs parallel to Kundli-Manesar-Palwal (KMP) Expressway near Sohana-Manesar-Harsana Kalan Stretch and about 95 Km alignment runs parallel to KMP.

Apart from that proposed alignment passes through 5 Districts i.e. Palwal, Nuh, Gurugram, Jhajjar and Sonipat in the state of Haryana and that will help in growth of industrial development as alignment directly connects to cities near Delhi.

2.3 Concept of Study

Our scope of work formulated as below:

2.3.1 Feasibility Study

a) Field Reconnaissance and assessment of existing yard facilities at serving station using hand held GPS.

b) Desk study on Google imagery and Topo sheets for assessment of alignment.

c) Foot by foot survey for identification of major constraints and features

d) Finalization of route based on Reconnaissance Survey.

e) Proposed rail connectivity route has been formulated with due consideration to the following aspects.

- Topographical and Geographical features of route.
- Existing National as well as State Highways and Indian Railway lines.
- Existing rivers, streams, canals and forest lands.
- Rail corridor by means of curves and gradients.
- Proximity of crossing stations to human settlements for future development as passenger corridor.
- Proximity to have connectivity to Industrial Model Townships along the corridor.

2.4 Stakeholder outreach on Haryana Orbital Rail Corridor Project

Haryana Rail Infrastructure Development Corporation Limited (HRIDC) has hosted an outreach event to the stakeholders on 13-02-2019 at Gurgaon to deliberate on the “Haryana Orbital rail Corridor Project from Palwal to Sonipat” with a key objective of providing boost to Rail Infrastructure projects in the Haryana state on the principle of cooperative federalism and emphasizing on opportunities for investors and stakeholders.

The event was a great success with great number of stakeholders and investors turned up and showed their interest to invest in the project. The list of all participant for the event was placed in the Annexure-X.
The Brief description on the proceedings of the event are mentioned below:

- Sh. Alok Nigam, IAS, Addl. Chief Secretary, Govt. of Haryana inaugurated the Stakeholders Meet and presided over the function.
- 30 delegates from the Govt. of Haryana & Ministry of Railways, 10 from the Financial Institutions and 24 delegates from the Industry participated in the discussion.
- MD/ HRIDC briefed the gathering about the activities of the company and about the Haryana Orbital Rail Corridor specifically.
- Sh. Alok Nigam, ACS (PW) addressed the gathering highlighting the need for the project. Running of Shatabdi from Gurugram to serve the unserved areas was emphasized.
- ED/ MTP/RB: Praised the efforts by HRIDC to develop this project. Explained the idea behind formation of JV companies with the participation of state Govt. & their working.
- Sh. Subodh Jain Principal Advisor (Former Member Engineering, Railway Board) made detailed presentation on the proposed Haryana Orbital Rail corridor project and clarified the doubts of the participants.
- Representatives from Reliance, All-Cargo, Maruti participated enthusiastically in the question & answer session.
- Hon’ble Chief Minister Haryana, Sh. Manohar Lal also attended the Stakeholders meet and appreciated the project & the enthusiasm shown by the participants in the meet.

Major highlights of the event

- M/s Maruti Udhyog Ltd have confirmed participation in the project SPV as Equity partner.
- M/s AllCargo has also shown keen interest to participate in this project and they will revert shortly after due deliberations in their BOD.
- This event has generated a lot of interest among various stakeholders and Investors.
- Railway Board & Northern Railway officials have also commended the idea of the proposed Haryana Orbital Rail Corridor.
2.5 Fixed Points

2.5.1 Pirthala to Sonipat

Alignment for Haryana Orbital rail Corridor is proposed by taking-off from Ch. 2210.91 m F/CSB for up line and from Ch. 2200.46 m F/CSB for down line of Pirthala Yard. For computing the route length of proposed alignment, the CSB of Pirthala Yard is assumed as 0.00m. Subsequently the chainage towards Sonipat has been considered as positive.

2.5.2 Y-Connectivity towards Rewari Station

Y-connectivity towards Rewari Station has been proposed from proposed Manesar railway station to existing Patli railway station in order to connect proposed Haryana Orbital rail Corridor alignment with Delhi – Rewari route. For computing the route length of Y-connectivity, the CSB of proposed Manesar railway station is assumed as 0.00m. Subsequently the chainage towards Patli has been considered as positive.

2.5.3 Y-Connectivity towards Garhi-Harsaru Jn Station

Y-connectivity towards Garhi-Harsaru Jn station has been proposed from proposed Badsa railway station to existing Sultanpur Halt station converting to block station in order to connect proposed Haryana Orbital rail Corridor alignment with Farukhnagar – Garhi-Harsaru Jn route. For computing the route length of Y-connectivity, the CSB of proposed Badsa Railway station is assumed as 0.00m. Subsequently the chainage towards Sultanpur has been considered as positive.

2.5.4 Y-Connectivity towards Rohtak Station

Y-connectivity towards Rohtak Station has been proposed from proposed Mandothi railway station to existing Asaudah station in order to connect proposed Haryana Orbital rail Corridor alignment with Delhi – Rohtak route. For computing the route length of Y-connectivity, the CSB of proposed Mandothi railway station is assumed as 0.00m.

2.6 Standard of Construction

Minimum Standards of construction for new railway lines under JV model participative policy of Indian railway vide Railway Board circular no. 2016/Infra/12/1, dt. 06.04.2018 shall be followed for the proposed railway infrastructure of Haryana Orbital Rail Corridor.

2.6.1 Category of Line

The proposed passenger line between Palwal to Sonipat 130Km (excluding Y-Connectivities) will be constructed to Group ‘A’ standard with maximum speed potential of 160 kmph.
2.6.2 Gradient

Ruling Gradient

1 in 200 compensated grade is considered as ruling gradient of the section

Station Yard

A gradient of 1 in 1200 is generally adopted in exceptional cases 1 in 400 has been adopted in all station yards. High level Passenger platforms and low-level loading platforms have been proposed at station locations with necessary loop lines and sidings.

2.6.3 Grade Compensation

Grade compensation at the rate 0.04% per degree of curvature has been provided on curves as per requirement of BG rail lines.

2.6.4 Gauge

The gauge adopted for the proposed alignment is 1676 mm to suit the existing gauge of Indian Railways.

2.6.5 Rails

60 Kg (T-12) - Prime quality is envisaged for connectivity and 52 Kg second hand rails to be used as check rails for curves and as guard rails for major bridges.

2.6.6 Ballast

Track Ballast as per IRS:GE-1 with 350 mm minimum cushion for mainline and 250mm for loop line have been envisaged for the project.

2.6.7 Sleeper

60 Kg PSC sleepers with 1660 nos. per Km for entire stretch/alignment shall be used.

2.6.8 Track Structure

Normal ballasted LWR track all along the alignment with the provision of blanket material (granular fill as per RDSO Specs).

2.6.9 Welding

Flash butt welding for LWR track and Alumino Thermic welding/SKV welding for SWR track have been envisaged.

2.6.10 Points & Crossings

All the crossovers in the proposed crossing stations connecting the main lines and loop lines shall have P&C of 1 in 12 with 60 Kg rails, CMS crossing on PSC fan shaped PSC sleeper
layouts. Turnouts provided for over shoot lines are proposed with 1 in 12 with 60 kg rails, CMS crossing and Fan shaped PSC sleeper layouts conforming to RDSO standards.

2.6.11 Switches & SEJ

For running lines, Thick web switches shall be used. Improved SEJ will be in used in LWR track section.

2.6.12 Track Tolerances

Track tolerances specified under IRPWM by the Railway Board for new lines shall be maintained.

2.6.13 Catch Water Drains and Longitudinal side Drains

Catch Water Drain or Longitudinal Side Drains are proposed wherever the depth of cutting is more than 3 m.

2.6.14 Speed potential

Maximum permissible speed on proposed corridor shall be 160 kmph. On turnouts speed shall not cross 30 kmph.

2.6.15 Length of Infrastructure

The total route length of the proposed alignment from Asaoti to Harsana Kalan is 130 km (excluding Y-Connectivities).

2.6.16 Traction

Railway line from proposed Asaoti to Harsana Kalan as Electrified.

2.6.17 Horizontal and Vertical Alignment

Design parameters for Railway Infrastructure are detailed below:

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<thead>
<tr>
<th>S.No.</th>
<th>Description</th>
<th>Specification</th>
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<td>b</td>
<td>Absolute Minimum</td>
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<tr>
<td>2</td>
<td>Minimum loop curve radius (in crossing stations) in m</td>
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<tr>
<td>a</td>
<td>Preferred</td>
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### Vertical Alignment Design Criteria

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<thead>
<tr>
<th></th>
<th>Absolute Minimum (in crossing station)</th>
<th>Straight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ruling Gradient</td>
<td>1 in 200 (Compensated)</td>
</tr>
</tbody>
</table>

#### 2.6.18 Formation

The top width of the formation in bank is proposed as 7.85m for Single line and 13.85m for double line. The bottom width proposed in cutting shall be 10.85m for single line and 16.85m for double line including side drains. The formation in the embankment is proposed with side slopes of 2H to 1V in banking and 1H to 1V in cutting. Granular blanket layer as per GE G:14 is proposed over the earth fill for the formation in banking. An extra width of 150mm is considered for formation width on curved track. The drawing showing Typical cross sections of Embankment and cutting are Annexed as Annexure-III(A1 & A2).

#### 2.6.19 Bridges

All the bridges are proposed for 25T loading as per IRS bridge rules-2008. The superstructure of all major bridges is proposed either as Steel open web girders/plate girders or PSC slabs. RDSO type Composite Girders are proposed for ROBs. However, a different design of superstructure during detailed design stage is not ruled out.

#### 2.6.20 Fixed Structure Clearance

Clearance of fixed structures is proposed to be adopted as per railway schedule of dimension for BG line.

#### 2.6.21 Road Crossing

All proposed road crossings are provided with either RUB or ROB as per the importance of road. Level crossings are avoided as per Railway Board’s letter No. 2013/W-I/Genl./0/30 pt.-II, of not proposing any Level crossings on new lines.

#### 2.6.22 Protective Works

Side slopes of banks shall be protected by providing turfing to prevent rain water flowing down and eroding the side-slopes. It is proposed to provide pitching to the slopes of the bank at platform locations to avoid erosion of slopes. The bridge quadrants will be provided with pitching to avoid erosion. Toe wall with pitching of slopes may be provided where available land width is less.
2.6.23 Fixed Structure Clearances

All fixed structures to be provided on the corridor shall have clearances conforming to recommended schedule of dimensions of Indian Railways.

2.6.24 Land requirement

Proposed alignment runs through Western DFCC ROW between Pirthala – Sohna, Reserved land corridor of 50mtr along the KMP expressway, Government land, private land, forest land etc. Necessary arrangement will be made by HRIDC to acquire the required land for development of Rail corridor. Entire land has been proposed to acquire for double line.

2.7 Miscellaneous works

Features like sign boards, Fouling marks, surface drains, embankment side slope protection, river training works etc shall be provided as per existing railway specifications and RDSO guidelines. Road diversions have been proposed for minor/earthen roads at certain locations based on importance to reduce the number of bridge openings.
3 Cost Estimation

3.1 Abstract Estimates

The total capital cost of the proposed Haryana Orbital Rail Corridor has been computed based on the Latest awarded rates of the Northern Railways and summary of estimate is placed below

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Description</th>
<th>Cost (in Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Civil Engineering</td>
<td>2255.28</td>
</tr>
<tr>
<td>2</td>
<td>Signalling and Telecommunication</td>
<td>135.29</td>
</tr>
<tr>
<td>3</td>
<td>Over Head Electrification and General Electrical</td>
<td>307.51</td>
</tr>
<tr>
<td></td>
<td><strong>Total Construction cost</strong></td>
<td><strong>2698.08</strong></td>
</tr>
<tr>
<td>4</td>
<td>Land Cost including Rehabilitation and resettlement</td>
<td>1088.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Cost including Land</strong></td>
<td><strong>3786.08</strong></td>
</tr>
<tr>
<td>5</td>
<td>HSIIDC Land cost (Considered as Sub-ordinate Debt)</td>
<td>300.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Cost (In Crores)</strong></td>
<td><strong>4086.08</strong></td>
</tr>
</tbody>
</table>

3.2 Methodology

The project is divided into the following structures for preparation of civil engineering construction cost estimate.

- Formation for Track
- Rail Track
- Bridges
- Tunnels
- Station Buildings
- Workshops
- Office Buildings
- Staff Quarters
4 Financial & Implementation Aspects of the Proposal

4.1 Estimation of Traffic Revenues

The year of commissioning of the Project is assumed to be end of 2024. Accordingly, revenue calculations have been done based on traffic projects from the year 2025.

4.2 Passenger Earnings

According to the Railway Board letter No. 2011/Infra/12/32 on Participative models for rail-connectivity and capacity augmentation projects, dated 10.12.2018, no apportionment of Passenger revenues will be made in the revenue model for the Project development JV. JV shall provide free access to IR Passenger Trains. Hence, Passenger revenue calculations are not presented in this report.

4.3 Freight Earnings

Freight revenues have been calculated separately for all commodities of freight anticipated, based on traffic projects made for incoming and outgoing traffic.

- Shortest Route as per http://rbs.indianrail.gov.in/ShortPath/ShortPathServlet have been taken for finding shortest route up to nearest stations present
- Revenue calculations and apportioning for project route has been made by using following formula

\[
Revenue = (FreightRate - TerminalCharges) \times (Traffic) \times \left(\frac{ProjectRouteLength}{TotalRouteLength}\right)
\]

- The freight rate per tonne as given in the Indian Railway Conference Association’s “Goods Tariff No. 48 Part I (Vol. II) & Part II”, applicable from 1st April 2015 has been taken for calculating freight revenues.
- Additional surcharges are collected on the Base freight rate Vide Railway Board Letter No.TCR/1078/2015/14 DATED 20.07.2015. They are Busy season charge 15% from 1st April to 30th June & 1st Oct to 31st March on all commodities except Container traffic and Automobile traffic. In addition Development surcharge is charged on all Goods Traffic throughout year.
- Revenue to SPV is taken as 50% of revenue of the project route length as per model JV agreement and Participative models for rail-connectivity and capacity augmentation projects- JV model.
The estimated total revenues (in LakhRs.) from freight traffic as applicable to the Project line (Palwal to Sonipat), and SPV are shown in the table below:

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2049</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>1</td>
<td>6</td>
<td>11</td>
<td>16</td>
<td>21</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>Operating Revenues to SPV (Lakhs)</td>
<td>0.00</td>
<td>449.88</td>
<td>574.17</td>
<td>732.81</td>
<td>935.27</td>
<td>1193.66</td>
<td>1450.91</td>
</tr>
<tr>
<td>10% Increased Revenue with non-fare box cost</td>
<td>0.00</td>
<td>494.87</td>
<td>631.5904</td>
<td>806.0871</td>
<td>1028.794</td>
<td>1313.031</td>
<td>1595.997</td>
</tr>
</tbody>
</table>

### 4.4 O&M Costs

In terms of extant policy of Railway Board, train operations shall be managed by Northern Railway. Further, manpower required for stations, commercial operations, fuel / energy cost and operation, maintenance & replacement of all rolling stock shall be on Railway’s account. The Concessionaire is expected to take care of maintenance of fixed assets, security, renewals and replacements, insurance, accident repairs etc. at its own cost. The Concessionaire shall have an O&M Agreement with Northern Railway to take care of these issues.

<table>
<thead>
<tr>
<th>Year</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
<th>2049</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Cost - For SPV (In Crores)</td>
<td>0.00</td>
<td>37.06</td>
<td>47.30</td>
<td>60.37</td>
<td>77.05</td>
<td>98.34</td>
</tr>
</tbody>
</table>

### 4.5 Financial Appraisal

Financial Appraisal is a method used to evaluate the viability of a project by assessing the value of net cash flows that result from its implementation. Financial Analysis looks at the impact of the project on the finances of the Sponsoring Agency.

A financial appraisal is concerned with the financial impact of the project on the finances of the Sponsoring Agency. Financial analysis focuses on cash flows as opposed to economic flows and, in particular, considers sustainability and profitability. Some of the general objectives associated with this type of analysis are:

- Identifying and estimating financial cash flows;
- Assessing financial suitability — sustainability occurs if the net flow of cumulated generated cash flow is positive for all years considered;
- Calculating performance indicators (e.g. Net Present Value, Internal Rate of Return); and
- Assessing funding sources for the project.
4.5.1 Net Present Value Method (NPV)

The Net Present Value (NPV) is the sum of the discounted cash flows over the period. This criterion is simply based on whether the sum of discounted benefits exceeds the sum of discounted costs.

4.5.2 Internal Rate of Return (IRR)

The internal rate of return is the maximum rate of interest that a project can afford to pay for the resources used which allows the project to cover the initial capital outlay and ongoing costs and still break even. It can also be described as the discount rate that equates the present value of benefits and costs. The IRR is generally compared to a hurdle rate of return (normally the test discount rate for public investment appraisal) which corresponds to the opportunity cost of funds.

Discounted cash flow (DCF) appraisal or valuation views the intrinsic value of an asset or a project as the present value of its expected future cash flows. When applied to dividends, the DCF model is the discounted dividend approach or dividend discount model (DDM). This reading extends DCF analysis to value a company and its equity securities by valuing free cash flow to the firm (FCFF) and free cash flow to equity (FCFE). Whereas dividends are the cash flows actually paid to stockholders, free cash flows are the cash flows available for distribution to shareholders.

In corporate finance or project appraisal, free cash flow to firm (FCFF) is a way of looking at a project's cash flow to see what is available for distribution among all the securities holders of the project entity. This may be useful to parties such as equity holders, debt holders, preferred stock holders, and convertible security holders when they want to see how much cash can be extracted from a company without causing issues to its operations.

Unlike dividends, FCFF and FCFE are not readily available data. Analysts need to compute these quantities from available financial information, which requires a clear understanding of free cash flows and the ability to interpret and use the information correctly. Forecasting future free cash flows is also a rich and demanding exercise.

Free cash flow can be calculated in various ways, depending on audience and available data. A common measure is to take the earnings before interest and taxes multiplied by \((1 - \text{tax rate})\), add depreciation and amortization, and then subtract changes in working capital and capital expenditure. Depending on the audience, a number of refinements and adjustments may also be made to try to eliminate distortions.
4.5.3 Discount Rate

The WACC is probably the single most important factor beside the return on invested capital (ROIC), when estimating a project’s financial feasibility – the basis for most strategy and performance evaluation methods. It is also the discount rate (time value of money) used to convert expected future cash flow into present value for all investors. To be consistent with the Free Cash Flow or Economic Profit approach, the estimated cost of capital must comprise a weighted average of the marginal cost of all sources of capital - debt, equity etc that involves cash payment, now or in the future - excluding non-interest-bearing liabilities (in simple form):

$$WACC = \frac{C_d \times (1 - t) \times D}{V} + \frac{C_e \times E}{V}$$

Where,

- $C_d$ = Pre-tax debt nominal interest rate,
- $C_e$ = Opportunity cost of equity capital,
- $T$ = Corporate marginal tax rate,
- $D$ = Market Value of interest-bearing debt,
- $E$ = Market Value of equity,
- $V$ = Market Value of entity ($V=D+E$)

Discount rate reflects the amount of risk associated with a particular investment. In another way, it is the rate of return an investor would require for choosing a particular investment and not any other alternative opportunities. Two broad approaches, namely the Ibbotson Build-Up Method and the Capital Asset Pricing Method are available to value an equity interest.

4.5.4 Capital Asset Pricing Model (CAPM)

As per Capital Asset Pricing Model,

$$Cost\ of\ Equity\ (K_s) = R_f + \beta \times (ERP) + SCR$$

Where,

- $K_s$ = Cost of Equity,
- $R_f$ = Risk Free Rate of Return
- $\beta$ = Beta
- ERP = Risk Premium
SCR = Project Specific Risk Premium

As can be observed, the CAPM model requires beta for which the market and comparable companies are selected and analyzed for their performances with regard to the market. In our analysis, the lack of comparable public companies prevented us from relying on CAPM model.

4.6 Haryana Orbital Rail Corridor Proposal – Project Executed by JV

This scenario is based on the following assumptions

- The Discounting rate has been 8.5%
- 30% Equity and 70% Debt model has been considered.
- Revenues are shared between SPV and MOR with 50% share of each as per model JV agreement.
- Costs to be incurred by SPV includes Project’s capital cost, O&M cost (Fixed + Manpower)

<table>
<thead>
<tr>
<th>Profit and Loss Statement for SPV as per JV model agreement -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Project Revenue</td>
</tr>
<tr>
<td>Project O&amp;M cost</td>
</tr>
<tr>
<td>EBITDA</td>
</tr>
<tr>
<td>D&amp;A</td>
</tr>
<tr>
<td>EBIT</td>
</tr>
<tr>
<td>Interest</td>
</tr>
<tr>
<td>PBT</td>
</tr>
<tr>
<td>Accumulated losses</td>
</tr>
<tr>
<td>Taxable income</td>
</tr>
<tr>
<td>Income Tax</td>
</tr>
<tr>
<td>PAT</td>
</tr>
</tbody>
</table>

FIRR Calculation for SPV -

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAT</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Add: D&amp;A</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Add: Interest Tax shield</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Less: Capex</td>
<td>1598.00</td>
<td>547.50</td>
<td>547.50</td>
<td>547.50</td>
<td>547.50</td>
</tr>
<tr>
<td>Less: Investment in Working Capital</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Add: Debt raised</td>
<td>1118.60</td>
<td>383.25</td>
<td>383.25</td>
<td>383.25</td>
<td>383.25</td>
</tr>
<tr>
<td>Less: Debt repaid</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Free Cash Flow to Equity</td>
<td>-169.98</td>
<td>-182.48</td>
<td>-182.48</td>
<td>-182.48</td>
<td>-182.48</td>
</tr>
</tbody>
</table>
4.7 Economic Appraisal

Substantial investment has been made at national level in rail transport infrastructure over the past 50 years and is likely to continue in the future. The need to appraise transport projects in economic and social terms has developed alongside this in both scope and complexity. The state-of-the-art in the economic appraisal of transport projects is reviewed, progress is assessed, and future challenges are identified. The review addresses the general framework, treatment of major impacts, presentation of outputs and issues such as uncertainty. It draws on national practice in India, and other countries, which varies substantially reflecting a range of cultural and economic differences. Some points of commonality exist, and the principle of monetizing direct transport impacts is generally accepted. Progress has been made towards the measurement of environmental impacts, but the assessment of the wider impacts remains under-developed. Increased sophistication and complexity have brought increasing data and presentation requirements, where computerized decision support methods have potential. Many challenges exist for the future of appraisal and the review is concluded with a discussion of some key issues. At the heart of these is the continuing debate over the relative roles of national and European government in decision-making and resource allocation.

Economic appraisal is a type of decision method applied to a project, programme or policy that takes into account a wide range of costs and benefits, denominated in monetary terms or for which a monetary equivalent can be estimated. Economic appraisal is a key tool for achieving value for money and satisfying requirements for decision accountability. It is a systematic process for examining alternative uses of resources, focusing on assessment of needs, objectives, options, costs, benefits, risks, funding, affordability and other factors relevant to decisions.
Economic appraisal is most effective when it becomes a routine part of capital works planning, incorporated from the early stages of project development. An iterative process may then follow, as data are updated; for example, as a result of revised more detailed construction cost estimates, or changes to the project as a consequence of the environmental assessment process. The appraisal is reassessed to ensure that the preferred option provides the best value for money outcome to meet the service objective.

An economic appraisal's methodology is such that certain concepts contained in conventional financial analysis, such as depreciation, interest, and inflation and sunk or historical costs are accounted for by different means or are not relevant to the evaluation of project options.

While economic appraisal is required for capital works proposals, it does not remove the need or desirability for financial analysis which will show cash flow demands on the State's finances, and the financial rate of return from the project for Sponsoring authorities.

Sponsoring authorities may also wish to separately show economic appraisal results from the agency's viewpoint, as well as from the overall community perspective, for comparative purposes.

4.8 Assessment of Economic Cost

The cost component of the Project are

- Capital Cost of the Project – which are computed on the basis of depreciation and amortization charges of the Project, which reflect the annual capital cost for the Project
- Operating Cost of the Project – which are the operations and maintenance costs derived from our analysis and survey.

4.9 Assessment of Economic Benefit

Reduction in Pollution - The setting up of the project will trigger a modal shift in transportation of goods from road to rail. This would reduce the number of trucks plying on road and consequently the pollution (in the form of vehicular emission) caused by the trucks would fall.

The benefits due to reduction in pollution have been calculated by considering the emissions caused by heavy commercial vehicles per km (0.0169 kg/km), and damage cost due to these emissions (INR 38.4 per kg of emission).

Land Freement - As major freight traffic will by-pass Delhi area, some of the yards & goods sheds will get closed, releasing huge area of prime real estate. Taking a conservative
estimate of only 50 acres during the project lifetime, @ 20 crores/acre total value computed to 1000 cr

**Benefits due to Increased Employment and Household spending** - The investment will lead to employment creation (both direct and indirect) An employment multiplier of 0.21 Jobs/INR Crore of investment as well as other appropriate multipliers (eg. indirect employment multiplier of 1.5) have been taken to quantify the benefits on account of employment generation. The quantified benefits using the above employment multipliers and using the average per capita income of Rs. 1,00,000 per annum has been computed.

**Economic Internal Rate of Return**

Based on the above net economic cash flows are computed, which are then adjusted for the initial investment required for the project and then, the economic internal rate of return is computed using the principles of discounting.

The EIRR of the project is therefore the implied rate of return for the society and other stakeholders at large and reflects a holistic assessment of the project.

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Benefits</td>
<td>736.31</td>
<td>322.68</td>
<td>322.68</td>
<td>322.68</td>
<td>215.58</td>
</tr>
<tr>
<td>Land Freement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset value to Govt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Economic benefit</td>
<td>736.31</td>
<td>322.68</td>
<td>322.68</td>
<td>322.68</td>
<td>215.58</td>
</tr>
<tr>
<td>Capex</td>
<td>(-1,870.00)</td>
<td>(-819.50)</td>
<td>(-819.50)</td>
<td>(-819.50)</td>
<td>(-547.50)</td>
</tr>
<tr>
<td>Economic Cash Flows</td>
<td>(-1,133.69)</td>
<td>(-496.82)</td>
<td>(-496.82)</td>
<td>(-496.82)</td>
<td>(-331.92)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>2028</th>
<th>2033</th>
<th>2038</th>
<th>2043</th>
<th>2048</th>
<th>2053</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Benefits</td>
<td>422.38</td>
<td>680.25</td>
<td>1,095.55</td>
<td>1,764.40</td>
<td>2,841.58</td>
<td>4,160.36</td>
</tr>
<tr>
<td>Land Freement</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Asset value to Govt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,616.32</td>
</tr>
<tr>
<td>Net Economic benefit</td>
<td>462.38</td>
<td>720.25</td>
<td>1,135.55</td>
<td>1,804.40</td>
<td>2,881.58</td>
<td>8,816.68</td>
</tr>
<tr>
<td>Capex</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Economic Cash Flows</td>
<td>462.38</td>
<td>720.25</td>
<td>1,135.55</td>
<td>1,804.40</td>
<td>2,881.58</td>
<td>8,816.68</td>
</tr>
<tr>
<td>EIRR</td>
<td>18.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

h SPV as per JV Model
The project may be implemented as a JV model as per Government of India Ministry of Railways (Railway Board) Letter No. 2011/Infra/12/32 dated 10.12.2018, “Participative models for rail-connectivity and capacity augmentation projects. Brief features of JV model as per Railway Board letter is detailed below-

**Applicability**

It is generally applicable for bankable new line and gauge conversion projects either sanctioned or proposed to be sanctioned having clearly identifiable stakeholder either as user of the line or utilities such as ports, mines, exporters, plants and state governments. Bankability of the projects, if required, can be enhanced through innovative financial structuring such as sub-ordinate debt, grants etc.

**Project Development and Project Structuring, Land Acquisition**

- Project development will be done by HRIDC through consulting Firms to establish project cost, land requirement, project design and other project component requirements, and project bankability.

- IR will do financial structuring of the project to make it bankable including identification of risk and mitigation measures.

- Land acquisition will be done either by Indian Railways at the JV’s cost or by the JV itself as mutually decided. Ownership of the land will vest with Railways. Land will be given to the JV on annual token lease of 1 Rs. For the entire concession period.

- Cost of acquisition of land will be treated as long term non-interest-bearing advance and will be refunded to the JV on expiry/ termination of concession. For such cases the land acquisition cost will be certified by an independent agency.

**Selection of Equity Partners, Funding, Revenue Model**

- It envisages participation of the stakeholder and beneficiaries besides national level infrastructure funding institutions in the development and creation of rail infrastructure through appropriate concession.

- Financial participation will be through equity participation in the JV. The JV will be a joint venture with railways as a partner with IR or HRIDC holding a minimum of 26% equity shares. Other partners will be selected from the stakeholders such as users of the line like ports, mines, other Industries etc.

- Selection of partners will be done through transparent expression of interest process, with clearly laid down technical qualification based on parameters like net worth, minimum threshold of equity participation etc. However, participation by
state governments and PSUs and other government entities will be through nomination basis.

- Projects will be assigned to JV by Ministry of Railways on nomination basis.
- Debt will be raised through project finance route without any guarantee by the government of India.
- Revenue from the operation on the project line will be collected by IR though its commercial staff. Revenue stream of the JV shall be established through revenue apportionment from freight operation for the project line as per inter-railway financial adjustment as stipulated in the IR code volume 1. No apportionment of the passenger revenues will be made. JV will provide free access to IR Passenger trains.
- Normal IR tariff/ freight rates will be applicable, inflated tariff to improve bankability could be approved by railway board in specific cases.
- Commercial utilization of railway land, commercial publicity rights as permissible under the law and public policy.

Construction

- Project construction will be done by the JV. Th JV must ensure transparency in project procurement in line with the extant guideline of government for public procurement. The JV may, however, choose to entrust construction to IR or its agencies by entering into a construction agreement. Certification will be done by IR as per the extant rules/policy.

Maintenance

- Maintenance of the project line could be done either by the JV or by IR through an O&M agreement. In case the maintenance is undertaken by the JV, supervision/certification shall be done by IR on payment of supervision/certification charges by the JV.

Operations

- Operations will be done by IR.

Recovery of O&M Cost

- IR will recover O&M cost or cost of operations as applicable as per the agreement. The JV shall compensate IR for the fixed cost that is the cost of essential operational and maintenance staff and other maintenance expenditure (if maintenance is to be
done by IR), or the cost of supervision/certification. The variable cost of operation i.e. the cost of rolling stock usage, fuel, crew etc. shall be recovered from the apportioned revenue. IR will pay to the JV apportioned revenue net of such cost as applicable, as per a predefined formula to be specified in the O&M or operations agreement.

**Concession Period**

- Concession period will be normally 30 years including the construction period. The concession period shall be subject to both upward and downward revision depending on shortfall/excess of traffic materialization vis-à-vis the specified threshold traffic (80% of the total traffic to be carried during the concession period expressed in terms of million tonne Kms.) On the target date (25 years after signing of the agreement) threshold traffic shall be determined on the basis of the feasibility report. For every shortfall of 4%, the concession shall be extended by 1 year and a reverse principle shall apply if actual exceed the threshold traffic. However, the concession period shall not be less than 25 Years and more than 35 years of operation.

- Cost of land acquisition paid by the JV shall not be factored in for the purpose of such equity return. No termination payment shall be admissible in case of natural expiry of concession period.

**Risk Mitigation**

- Traffic guarantee and rolling stock availability agreement will be signed wherever such guarantees are considered necessary to mitigate demand risk. Traffic guarantee shall be in form of a “Take or Pay” agreement on the part of strategic partners (users) for the minimum volume of traffic to be moved. Strategic partners will be required to enter into an agreement with IR on minimum commitment of traffic volumes to be moved on the line. IR shall assure provision of rolling stock for loading and transportation in respect thereof. In case of failure by either the strategic partners (users) or IR, penalties stipulated in the agreement shall be payable to JV.

**General Features**

- JV shall operate “common carrier” principle of public transportation of goods and passengers. For Rail users, IR would be the interface.
5 Proposed Financial Structuring


- The project may be implemented as a SPV by HRIDC with Debt-Equity ratio of 70:30 considering the total cost of project is 4086.08Cr including land, the financial results like Equity IRR is computed to 13.44% with Equity NPV of 1015.48Cr. (Ref: Para 4.6 of this report)

- The total project cost including private land that need to acquired is 3786.08cr (Ref: Chapter-03 of this report) of which 70% debt i.e 2650.25 Cr and 30% overall equity i.e 1135.82 Cr is considered.

- Out of the total equity, various stakeholder equity share is mentioned below

<table>
<thead>
<tr>
<th>Overall Equity</th>
<th>1135.82 Crores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity share of Various Stakeholders</td>
<td></td>
</tr>
<tr>
<td>Stakeholder</td>
<td>% Equity Share</td>
</tr>
<tr>
<td>HRIDC</td>
<td>30%</td>
</tr>
<tr>
<td>Private Sectors</td>
<td>40%</td>
</tr>
<tr>
<td>Other PSU's</td>
<td>30%</td>
</tr>
</tbody>
</table>

- The proposed alignment passes through the HSIIDC land near IMT Sohna, Manesar and Kharkhoda of about 70 Hectares. This land costing approximately Rs. 300 crores is proposed to be taken under subordinate debt.