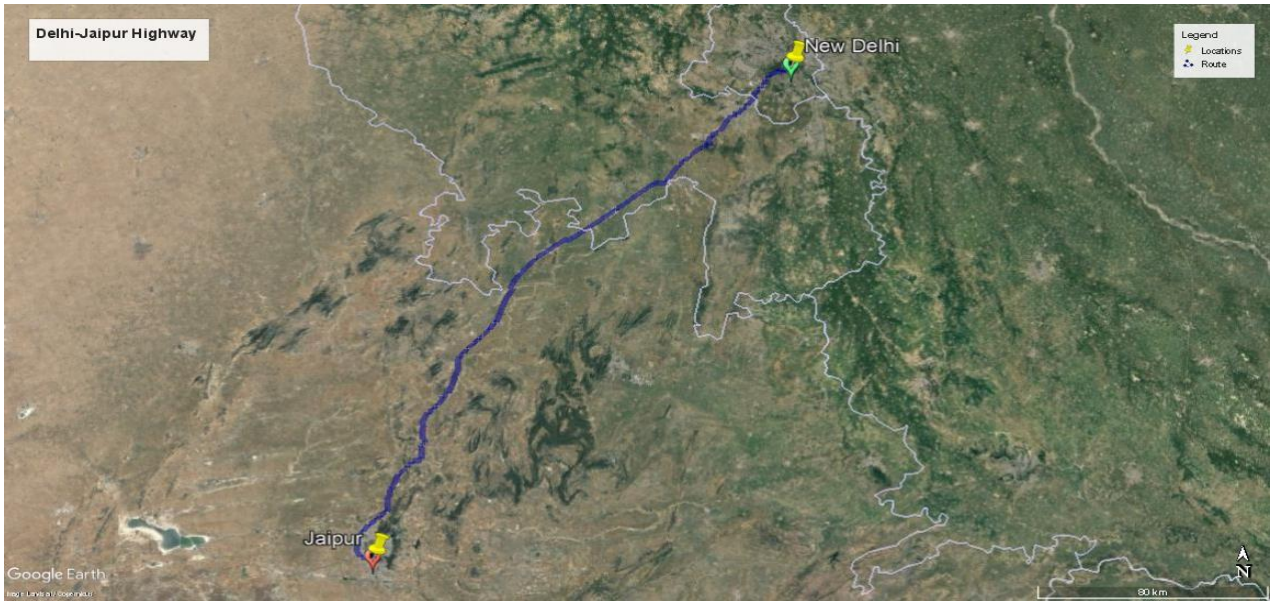
Prospectus Document

Delhi-Jaipur Highway

Introduction

Delhi Jaipur expressway which is a section of National Highway 48, is an 8-lane highway with an approximate length of 195 Kms. It connects Delhi NCR with Rajasthan's capital Jaipur. Connecting two prominent cities of north India, this is one of the busiest highways in India. It's a vital component of the Delhi Mumbai industrial Corridor with several of the industrial townships like Manesar, Pataudi, Bawal and Nangal Choudhary in Haryana and Bhiwadi, Behror, Kotputli, Shahapura and Chomu in Rajasthan connected along the route. This expressway passes through 423 villages of 11 tehsils in 7 districts namely: Gurgaon, Jhajjar, Rewari, Mahendergarh, Alwar, Sikar and Jaipur of Haryana and Rajasthan. The total land required for the project was 1,755.9 hectares (4,339 acres). The cost includes ₹6,350 crores for civil works, ₹5,000 crores for resettlement and rehabilitation of affected individuals, and ₹50.60 crores for environment budget.



Delhi-Jaipur Highway	
Length	195 Kms
Districts	Gurugram, Rewari , Jhajjar, Mahendragarh Alwar, Seekar and Jaipur
Toll plazas	Manoharpur, Shahjahanpur and Kherki
Total Cost of Construction	₹18,000 crore
No. of Villages	423
Managing Authority	National Highway Authority of india

Corridor Analysis

National Highways Authority of India (NHAI) has set the target for development of EV charging infrastructure by installing charging stations at every 50 kilometer distance along the national highways by 2023.

While the number of charging stations found along the highway during the survey were less than expected, it still had a fair number of charging stations, most of which were situated within 25 kilometers apart from each other. Delhi-Jaipur highway holds an advantage over other potential highway corridors in terms of number of charging stations and connectivity to the nearby towns – the highway is along the cities and does not require specific entry and exit points. Most of the charging stations along Delhi-Jaipur Highway are installed within the premises of food complexes and petrol pump providing better visibility and accessibility.

One of the most important aspects of installing a charging station for medium and heavy duty vehicles is power capacity. It is critical that all such charging stations must have a rated capacity of 30 kW or above. Of the six fast chargers along the route, four charging stations had a power rating of 60 kW which is essential for the fast charging of commercial vehicles. These chargers would usually take 45-50 minutes to fully charge a medium duty vehicle and 90-120 minutes for heavy duty vehicles. A drawback is that for charging a vehicle, owner/driver needs a mobile application specific to the charging service provider. This not only limits the accessibility to all charging stations but could require further training of generally non-tech savvy drivers.

The highway has a vast network of supporting infrastructure and is well connected to other state highways - SH-13 and SH-52 of Rajasthan. There are several educational institutes along the highway which can be a proponent for higher sales of commercial vehicles making a case for charging capacity expansion.

Details of the charging stations surveyed along Delhi-Jaipur Highway with its specifications are provided below:

1. Zivah Electriva EV Charging Station

Service Provider: Zivah Electriva
Manufacturer: Zivah Electriva
Number of Charging Point: 01
Location: Hotel Prince, Raghunathpura
Model: Infinity DC60
Power Rating: 60 kW
Connector: Double
Input Voltage: 400 V AC
Output Voltage: 200-1,000 V DC
Rated Frequency: 50/60 Hz
Production Date: August 2022
Status: Installed but not operational

2. Tata Power DC Fast Charging Station

	Service Provider: Tata Power
	Manufacturer: ABB
	Number of Charging Points: 03
	Location: Rajshree Hotel, Chandwaji
	Model: NA
	Power Rating: 30 kW, 7.5 kWx2
	Connector: Single
	Input Voltage: 415V AC
	Output Voltage: 200-750V DC
	Rated Frequency: 50 Hz
	Production Date: October 2021
	Status: Operational

3. Statiq EV Charging Station

	Service Provider: Statiq
	Manufacturer: Exicom Power Solutions
	Number of Charging Points: 1
	Location: Hotel Highway Express, Behror
	Model: EVDC Harmony 60 kW
	Power Rating: 60 kW
	Connector: Double
	Input Voltage: 415 (320-520) V AC
	Output Voltage: 200-750 V DC
	Rated Frequency: 50/60 Hz
	Production Date: April 2022
	Status: Operational

4. Charge+Zone EV Charging Station

	Service Provider: Charge+Zone
	Manufacturer: Quench Chargers
	Number of Charging Points: 1
	Location: Hotel Highway King, Behror
	Model Name: NA
	Power Rating: 60 kW
	Connector: Double
	Input Voltage: 400 V AC
	Output Voltage: 200-750V DC
	Rated Frequency: 50/60 Hz
	Production Date: January 2022
	Status: Operational

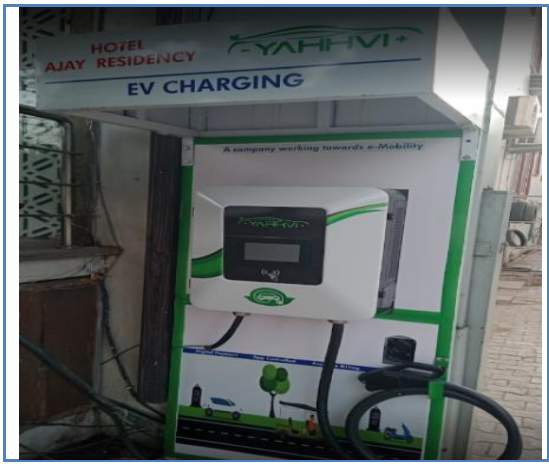
5. Statiq EV Charging Station

Service Provider: Statiq
Manufacturer: Exicom Power Solutions
Number of Charging Points: 1
Location: Hotel Highway King, Behror
Model: EVDC Harmony 50 kW
Power Rating: 50 kW
Connector: Double
Input Voltage: 400 V AC
Output Voltage: 200-750 V DC
Rated Frequency: 50 Hz
Production Date: September 2021
Status: Operational

6. Statiq EV Charging Station

Service Provider: Statiq
Manufacturer: Exicom Power Solutions
Number of Charging Points: 1
Location: Hotel Highway King, Neemrana
Model: EVDC Harmony 60 kW
Power Rating: 60 kW
Connector: Double
Input Voltage: 415 V AC
Output Voltage: 200-750 V DC
Rated Frequency: 50 Hz
Production Date: September 2021
Status: Operational

7. Yahhvi Charging Station



Service Provider: Yahhvi
Manufacturer: yahhvi
Number of Charging Points: 1
Location: Hotel Ajay Residency, Kherki Daula
Model: NA
Power Rating: 30 kW
Connector: Single
Input Voltage: 240V AC
Output Voltage: 240V AC
Rated Frequency: 50 Hz
Production Date: November 2021
Status: Operational

8. Alektrify Charging Hub

	India's largest EV charging station with 100 charging points for four wheelers (72 AC slow charger and 24 DC fast chargers) is located in Sector 52 of Gurugram. The charging hub is installed and operated by Alektrify. The station is capable of fully charging 576 electric vehicles in a 24 hour span. Alektrify is an official commissioning and installation partner company of NHEV pilot for setting-up charging stations on Jaipur–Delhi-Agra e-highway under Ease of Doing Business pilot program.

SWOT Analysis of Delhi-Jaipur Highway

STRENGTH	WEAKNESS
• Adequate number of charging stations • Location of the charging stations • Readily available Infrastructure support • Easy connectivity to towns/ cities along the highway • Proximity to automobile manufacturing hub in Manesar along the highway • The highway serves as a gateway to Rajasthan – a famous tourist destination • Advantage of logistics in charging point installation	• Lack of safety measures • Operation and maintenance challenges – many charging points were dysfunctional • Completely automated charging procedure • Inadequate supporting infrastructure – shading, waiting areas, drinking water facilities etc. • Unsatisfactory user interface • Unregulated tariff structure
OPPORTUNITY	**THREAT**
• Great scope for capacity expansion – space availability is not a concern • Multiple partnership opportunities with food and shopping complexes, resorts etc. • Development of service network • Demand is not limited to vehicles plying on the highway • Higher concentration of two-wheelers on the highway	• High exposure to heat and dust • Growth rate of charging infrastructure not matching up with EV sales • Constantly evolving charging technology • Charging time constraints for commercial vehicle category • Non-tech savvy (generally commercial) vehicle operators may find the charging process cumbersome

Strength

- Delhi-Jaipur highway has adequate number of charging stations to cater to the demand of current volume of EVs. Moreover, these charging stations are not concentrated in a specific area but distributed equidistantly on both sides of the highway
- Majority of the charging stations are along the highway and there is no requirement of exiting the highway and navigating for the charging station
- Due to high traffic volume, ample number of restaurants, food complexes, hotels and resorts are along the highway which not only provide land for charging stations but additional infrastructure support
- Delhi-Jaipur highway cuts across the major towns and cities along the route providing an ease of connectivity in inter-city delivery of goods
- Automobile and industrial hubs in Manesar, Neemrana, Rewari etc. are along the highway can supplement the development of EV ecosystem
- The highway is considered as a gateway to Rajasthan and goods from most northern states states are transported along the route to Jaipur and inner parts of the state. The development of this highway holds a significant economic value
- Currently, majority of the charging service providers operate out of Delhi-NCR region and installing charging station along Delhi-Jaipur highway is a cost effective exercise for these organisations

Weakness

- SOPs for charging were not clearly defined in any of the charging stations and this could pose a serious safety concern with high voltage cables in operation
- Charging stations were not regularly serviced which was evident as many stations were wither defunct or had other technical issues
- Completely automated charging procedure can be a hindrance for commercial fleet owners in absence of capacity building initiatives
- Many charging points were devoid of basic infrastructure facilities such as shade, waiting area with sitting facility, drinking water etc. which could demotivate a potential buyer
- An EV owner must have a know-how of mobile applications for charging which generally differ from one service provider to other
- The highway cuts across two different states namely Haryana & Rajasthan which may have different tariff structure for charging EVs. This could influence the decision of a where to charge a vehicle

Opportunity

- Given the semi-arid geography of the region, land availability for charging station is not a big concern in terms of regulatory clearance. Hence, a greater scope for capacity expansion
- As stated earlier, there are many foods and shopping complexes, resorts etc. along the highway and many of the charging stations surveyed were installed within the premise. This provides a degree of comfort to vehicle operators and passengers while charging the vehicle. Charging stations within these complexes is a mutually beneficial business model for every stakeholder involved and will be the way forward
- The ease of connectivity to towns along the highway and automotive hubs can provide additional support in development of a strong EV service network
- Not just the vehicles on the highway but EV operators from nearby regions also benefit from charging stations that have been installed. The demand from the this category can also be an opportunity for service providers
- The movement of electric two-wheelers is comparatively on the higher side on Delhi-Jaipur Highway. This creates an additional scope for service providers

Threat

- The proximity to highway causes excess dust accumulation on charging stations which have multiple delicate electronic components and circuits. This could increase the frequency of maintenance required. Furthermore, exposure to natural elements like heat and rain in absence of covering structure can accelerate asset deterioration
- The lag in growth between EV sales and charging infrastructure can put additional burden on existing facilities and cause congestion at charging stations. This factor highly influences the commercial vehicle segment where timely delivery of goods is associated with revenue generation
- Constantly evolving charging technology may render the existing charging infrastructure underutilised or of no value. This was observed for many of the charging points installed before 2020
- Average charging time for commercial vehicle ranges from 60-120 minutes depending on the capacity of charging point. This is a significant amount of time for commercial vehicles where time to deliver goods is proportionate to revenue generated
- All charging points require a mobile application to access, control and monitor. Downloading and using applications can be quite challenging for some users, particularly with elderly and non-tech savvy vehicle operators

Assessment

Delhi-Jaipur highway is an important link between the national capital and state capital of Rajasthan for socio-economic development. Additionally, it is a lifeline and livelihood opportunity for many of the people from 423 villages with an estimated population of 2 million, which are along the highway or in close proximity.

Although the highway has a comparatively strong network of charging infrastructure, it still has scope for further strengthening the daily volume of traffic. With Delhi NCR region being the hub of EV manufacturing and Delhi having the highest penetration of among all other states, number EVs on this highway are going to increase rapidly, suggesting an underlying need for rapid deployment of charging stations.

Delhi Jaipur highway is well connected to many industrial towns which makes it a hotbed of economic opportunities. Setting charging infrastructure here would not just support help in decarbonizing transport, but will also boost tourism from the green tourism perspective. With all the factors considered, the highway is the most preferred choice for carrying out the pilot project.