

## Approach Note

# Exploring the Potential of Last Mile Transportation as an Enabler for Green Jobs (GreenJobs III)

## 1. Background

Cities are experiencing historically unprecedented levels of urbanisation. In 2030, there will be 8.5 billion people on the planet, 5.1 billion of whom, or 60 percent of the total population, will live in cities. In case of India alone, urban population is expected to grow from 410 million in 2014 to 814 million in 2050<sup>1</sup>. Increased urban density will lead to exponential rise in congestion. To ease out the congestion in cities, use of public transport will be imperative. Further, with the introduction of appealing, user-friendly apps and tech-enabled driving networks consumers are showing increasing preference for online mode of delivery for goods<sup>2</sup>. In order to facilitate greater use of public transport and online mode of delivery, last mile connectivity plays an important role.

Historically, last-mile connectivity through conventional ICE vehicles has been a part of the mobility ecosystem of several Indian cities. However, with increased environmental concerns and rising awareness, there is a visible shift to cleaner and greener alternatives. Electric vehicles (EV) are seen as an important component of a technology portfolio aimed at reducing greenhouse gas emissions as well as the dependence on oil<sup>3</sup>. Since last mile connectivity and last mile delivery is an important component for increasing the use of Public Transit System, both government and private players have also been taking several initiatives to green these fleets. While government is providing subsidies and reducing the tariff for electric vehicle charging, the private players are focusing on Research and development to drive down the cost of batteries, which is a major cost in electric vehicles. These initiatives have resulted in E-2Ws and E-3Ws capturing a significant share of the electric vehicle market in India.

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- 1 <https://www.teriin.org/resilient-cities/urbanisation.php#:~:text=India's%20urban%20population%20is%20expected,6.3%20billion%20inhabitants%20by%202050.>
  - 2 <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ordering-in-the-rapid-evolution-of-food-delivery>
  - 3 [https://www.researchgate.net/publication/299687560\\_Socio-Economic\\_Aspects\\_of\\_Electric\\_Vehicles\\_A\\_Literature\\_Review](https://www.researchgate.net/publication/299687560_Socio-Economic_Aspects_of_Electric_Vehicles_A_Literature_Review)

## 2. Greening Last mile connectivity and its impacts

By 2024, it is expected that India's last-mile logistics market will have grown exponentially to , to USD 5 billion<sup>4</sup>. Local constraints and the need for internet purchasing have resulted in a significant change in consumer behaviour since the start of the COVID-19 epidemic. Currently, Tier II and Tier III cities account for one out of every five users of e-commerce platforms. This calls for a need of transport whose costs are low in terms of operation. That is why 3W cargo vans are increasingly popular for last-mile delivery of small loads<sup>5</sup>.

Generous government financial incentives, such as direct purchase subsidies, tax credits, or tax exemptions, have helped countries to increase the adoption of electric vehicles<sup>6</sup>. This can be observed in case of India too. Increasing adoption of EVs has also resulted in development of an ecosystem in various states to support the Electric vehicles. This has led to direct jobs in the auto industry in manufacturing, research and development, and battery manufacturing. Indirect jobs will also be created from the installation and maintenance of electric vehicle supply equipment<sup>7</sup>. The project will aim to capture these impacts with the help of parameters such as the quantum of livelihood opportunities created as a result of greening of last mile and financial resilience of the EV users to withhold any economic shock.

Another area of focus will be the social impact created as a result of greening of last mile. The major indicators identified are inclusivity (economic, gender and disabilities) and human capital development potential of the EV drivers. The parameters used for measuring these impacts will be economic opportunities for women and differently-abled persons, dynamic of skill development and dynamics of health and education.

Under the environmental indicators, the project will aim to quantify the greenhouse gas emissions avoided as a result of electric vehicle adoption. The project will try to measure only the scope 1 emission with reference to the owner of the EV. The project will also try to quantify the noise level reduction and improvement in air quality of the respective tier 1 and tier 2 city.

The Economic, social and environmental indicators have been summarised in the Table 1.

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4 <https://www.financialexpress.com/express-mobility/vehicles/2-wheelers/indias-last-mile-logistics-sector-to-be-torchbearer-for-ev-adoption/2560234/>

5 <https://auto.economictimes.indiatimes.com/news/industry/ev-charger-on-wheels-omega-seiki-log9-to-deploy-10000-instachargable-rapid-evs/90712873>

6 <https://blogs.worldbank.org/transport/if-you-build-it-they-will-come-lessons-first-decade-electric-vehicles>

7 <https://cuts-ccier.org/pdf/approach-note-exploring-the-potential-of-e-mobility-as-a-booster-for-local-economy-and-livelihoods-in-india.pdf>

**Table 1: Indicators**

S. No.	Indicator	Parameters	Details
1	Economic: a. Employment generation b. Financial Resilience	1. Job creation due to E-2W and E-3W use for last mile passenger or commercial use 2. Financial and economic benefits	Type, number of jobs linked to the EV ecosystem.  Wages/ Change in wages since shift to E-2W/3W use  Savings/Change is savings since shift to E-2W/3W use
2	Social a. Inclusivity b. Human Capital Development	1. Economic opportunities/participation and ease of access/use for women 2. Economic opportunities/participation and ease of access/use for differently-abled persons 3. Potential for skilling and upskilling 4. Improvement in Education 5. Improvement in Health	Quantum of livelihood opportunities for women and differently-abled persons  Types and level of skill development  Dynamics of expenditure on health, education, and skill development
3	Environmental: 1. Carbon Footprint 2. Noise Pollution	1. Carbon Emission Mitigation 2. Noise Reduction	Scope 1 emission reduction with reference to the owner of the EV  Quantification of Noise reduction as a result of EV use in last mile connectivity

### 3. Locations

In this project, we will explore the potential of decarbonisation of last mile connectivity on local economy and livelihood opportunities including gender inclusivity, skill inclusivity, reduced environment pollution and standard of living from a ‘just transition’ point of view. The overarching aim will be to explore the connectivity practices in Tier 1 and Tier 2 cities of India and construct a comparative map regarding the preferable modes and strategies for electrification for last mile delivery and last mile connectivity of passengers.

The selection of tier 1 and tier 2 cities has been done on the basis of EV sales data of E-3W provided on the Vahan Dashboard dated 16.05.2022<sup>8</sup>. The reason why E-2W data has not been considered for this selection is because it is also purchased for personal use.

**Table 2: E-3W Sales Data for Tier 1 Cities**

Cities	3W Electric	3W Total	3W as %age of 3W Total
Bengaluru	14043	368676	3.809%
Delhi	117696	439980	26.750%
Ahmedabad	658	197088	0.334%
Mumbai	110	59502	0.185%
Chennai	4362	157367	2.772%

**Table 3: E-3W Sales Data for Tier 2 Cities**

Cities	3W Electric	3W Total	3W as %age of 3W Total
Goa	31	3586	0.864%
Nashik	130	26064	0.499%
Ajmer	623	11090	5.618%
Jaipur	24702	59312	41.648%
Vadodara	305	56396	0.541%
Jodhpur	415	22297	1.861%
Nagpur	4728	30215	15.648%
Surat	186	89344	0.208%
Patna	13068	96572	13.532%
Bhubaneshwar	467	59170	0.789%
Varanasi	10978	57083	19.232%
Lucknow	34756	56107	61.946%
Kanpur	27282	85057	32.075%
Ranchi	2874	495084	0.581%
Prayagraj	12628	40801	30.950%

<sup>8</sup> <https://vahan.parivahan.gov.in/vahan4dashboard/>

Based on the above criteria, the selected Tier 1 cities are: Delhi and Bangalore & the Tier 2 cities are: Jaipur and Lucknow

### **Delhi:**

In order to ensure connectivity with different transit systems like mass rapid transit system (MRTS), Bus Rapid Transit System (BRTS), and Light Rail Transit System (LRTS), etc. E-3W is becoming a preferred mode of transport for the passengers. As of 16.05.2022, there were 117696 E-3Ws which comprised of more than one fourth of total 3W sold across Delhi<sup>9</sup>. Due to significant operating cost savings over 3-wheelers fuelled by fossil fuels, electric 3Ws are being adopted very well in the last-mile delivery market too<sup>10</sup>. This is preferred by the small business units whose load requirements are either less or equal to one ton. This also becomes a sustainable, pollution-free solution in the cargo segment.

2W are a preferred choice for delivery in hyperlocal segment. The use of 2W in commercial applications has increased with the rise of the gig economy. In hyperlocal delivery, the courier agent typically uses 2Ws and travels between 5 and 15 kilometres to deliver the product from the vendor to the customer, taking between 2 and 8 hours. One of the challenges associated with last mile delivery using 2W is related to the cost as no consolidation of goods is possible here. Here, use of electric vehicle brings cost saving to the driver as the operating costs are very less<sup>11</sup>. Zypp electric is a Gurgram based startup that provides electric vehicles for last mile delivery in Delhi or Gurgaon to the companies such as Swiggy, Zomato and Zepto which are looking for green fleet solution.

To curb the problem of air pollution and accelerate electric vehicle adoption in delivery segment, Dialogue and Development commission of Delhi in collaboration with RMI India has prepared a roadmap for achieving 100% electrification of last mile delivery service fleets by 2030<sup>12</sup>.

### **Bangalore:**

Even though 3W EV sales comprised of only 4% of total 3W EV sold, Bangalore was second among the tier 1 cities in adopting 3W as a last mile connectivity option. With the recent announcement by BMRC to expand Metro line, the market for e-3W sales is bound to increase<sup>13</sup>. Again, the surge in online shopping especially after the pandemic<sup>14</sup> will compel the business owner to look for cheaper alternatives where they don't have to spend much on

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9 <https://vahan.parivahan.gov.in/vahan4dashboard/>

10 <https://www.financialexpress.com/express-mobility/mahindra-e-alfa-cargo-electric-3w-launched-in-india-priced-at-rs-1-44-lakh/2417389/>

11 [Opportunity for Electric Two-wheeler \(e-2W\) in Hyperlocal Economy of India | WRI India Ross Center for Sustainable Cities | Helping cities make big ideas happen \(wricitiesindia.org\)](#)

12 <https://timesofindia.indiatimes.com/city/delhi/roadmap-for-fully-electric-last-mile-fleet-in-next-8-yrs/articleshow/90944540.cms>

13 Bengaluru Metro expansion: Govt, ADB sign \$500 million loan to build two new lines. Know about routes | Mint (livemint.com)

14 COVID-19 lockdown: Surge in online purchases slows down deliveries - The Hindu

operating cost. Here, the use of e-3W as a delivery option can also be explored. increasing consumer preference towards online shopping Along with this, a strong policy focus on EV ecosystem development by the Karnataka government, Bangalore has the potential to lead in EV manufacturing as well as its adoption in the last mile connectivity option.

Bangalore is also actively transitioning to electric 2Ws in the last mile deliveries segment. There are many start-ups working in the delivery market which are planning to use electric vehicles in a big way. For example, Swiggy has plans to cover 8 lakh km per day using EVs by 2025<sup>15</sup> of which majority are 2Ws. Bangalore based Welectric is also working for last mile delivery to go electric<sup>16</sup>.

### **Jaipur:**

Government of Rajasthan in its notification dated 16.07.21 had announced the subsidy for 2W and 3W electric vehicle based on the battery capacity<sup>17</sup>. This incentive coupled with the subsidy offered by central government has resulted in increased adoption of e-3W in the city both for passenger use as well as goods delivery. As of 16.05.2022, e-3W comprised of roughly 40 percent of the total 3W sold, which is the second highest among all the tier 2 cities. Jaipur has a robust road network system<sup>18</sup> as compared to Metro transit system, which is at nascent stage. With the ongoing efforts by the governments towards the infrastructure development, the city has the potential to increase its share of electric vehicles in the near future.

### **Lucknow:**

Uttar Pradesh had notified its EV policy as early in 2019 to promote investments in EV sector as well as to increase its adoption in the state. The state in its policy has clearly stated that it is going to phase out all conventional commercial fleets and logistics vehicles and achieve 50% EV mobility in Goods transportation in identified 10 EV cities by 2024 and all cities by 2030. The state has plans to roll out 10 lakhs electric vehicles across all segments by 2024 and has plans to set up 2 lakh slow and fast charging station by 2024. The result of all of this is that the cities of Uttar Pradesh are seeing accelerating adoption of electric vehicles. Lucknow has approximately 62% of 3W as electric making it to the top among the tier 2 cities. Considering its young demographic<sup>19</sup> and developmental works going around, the city can become 100% electric in 3W segment in years to come.

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15 <https://auto.hindustantimes.com/auto/news/swiggy-aims-to-cover-8-lakh-km-per-day-using-electric-vehicles-by-2025-41628151250204.html>

16 <https://yourstory.com/2020/11/bengaluru-startup-welectric-ev-adoption-last-mile-delivery/amp>

17 EV-olution in Rajasthan | ccier (cuts-ccier.org)

18 Final Combind.cdr (rajasthan.gov.in)

19 <https://www.hindustantimes.com/india-news/up-bihar-have-india-s-youngest-population-kerala-tamil-nadu-the-oldest/story-Uyr51Lplz4KiexyLjESLuL.html>

## 4. Methodology:

**Step 1:** Literature Review - Literatures linked with decarbonisation and its impacts (In terms of social, economic and environmental) will be analysed with regards to last mile connectivity. This will be followed by evaluation of existing EV policies of various states of India and how it is enabling the last mile connectivity in those states.

**Step 2:** Mapping of Stakeholders (Scoping Visits) and Secondary Data Collection

- i. To understand the city mobility ecosystem, preferred modes of transport and challenges in greening the last mile connectivity, scoping visits will be undertaken in 2 of the selected cities, i.e. one Tier 1 city and one Tier 2 city and relevant stakeholders will be mapped.
- ii. Collection of data related to local socio-economic development from relevant Government databases and departments.

**Step 3:** Primary Data Collection

Key Informant Interviews (KIIs)/Surveys and Focus Group Discussions (FGDs) will be conducted with the key stakeholders, namely the consumers the vendors/vehicle drivers, the transit agencies/aggregators and the government for data collection. The aim will be to Capture the insights on the indicators mentioned in Table 1. Further, existing challenges and gaps according to various stakeholders will be identified, which is slowing or curtailing the greening of last-mile connectivity.

**Step 4:** Data Analysis and Preparation of Outputs

Using an ecosystem approach, qualitative analysis of factors enabling last-mile connectivity will be undertaken. Simultaneously, quantitative analysis of social, economic and environmental impacts in terms of the indicators mentioned in Table 1 will be undertaken using the relevant statistical methods.

Findings from the quantitative and qualitative data analysis will be consolidated. Based on these findings, actionable recommendations will be suggested, which will act as a roadmap for greening the last mile connectivity. An infographic report will be prepared to consolidate the findings.