



Issue Brief

# Delhi's EV Push: Implications for Gig Workers

June 2024



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**Koan Advisory Group** is a New Delhi-based public policy consultancy. It specialises in policy and regulatory analysis in both traditional and emergent sectors and markets. For more information, please visit: [www.koanadvisory.com](http://www.koanadvisory.com)

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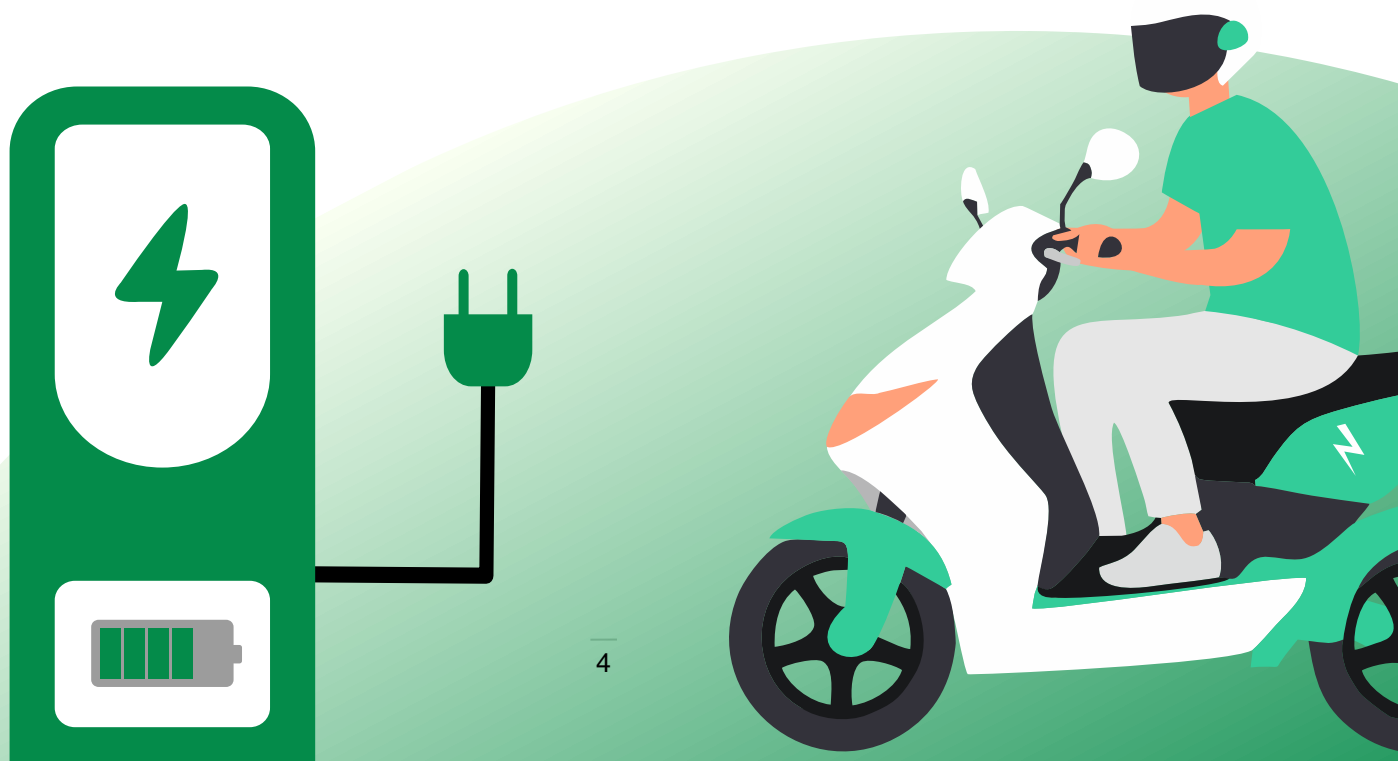
# Executive Summary

The Delhi Motor Vehicle Aggregator and Delivery Service Provider Scheme 2023 (DMVADSPS) is an initiative to accelerate electric vehicle (EV) adoption in India for aggregator apps, delivery service providers, and e-commerce companies. Introduced by the Delhi government in November 2023, the scheme sets fleet electrification goals using a mix of incentives and disincentives to achieve full electrification of fleets by 2030.

But gig workers, who lie at the forefront of this transition, face an ecosystem unprepared for EV-related challenges. This makes analysing DMVADSPS crucial from their viewpoint, potentially setting a national precedent. Gig workers encounter financial strains due to limited EV financing options, higher interest rates on electric two-wheelers (E2Ws), and challenges in insurance availability.

The potentially high total cost of ownership (TCO) for E2Ws, influenced by uncertain resale values and inadequate charging infrastructure, poses significant concerns. Range anxiety exacerbates downtime risks, impacting gig workers' earnings, too.

In conclusion, the DMVADSPS presents a crucial opportunity in India's EV transition, demanding nuanced policies to alleviate financial burdens, ensure robust charging infrastructure, and facilitate a seamless shift towards sustainable mobility for gig workers.



# Introduction

The DMVADSPS of the Delhi government was introduced in November 2023. It aims to accelerate EV adoption in the state by making fleet electrification for aggregators, delivery service providers and e-commerce companies, mandatory.<sup>1</sup> It also includes large delivery businesses, such as Swiggy and Zomato, which rely on gig workers<sup>1</sup> for last-mile delivery operations.

Gig workers are unprepared to face challenges within the EV ecosystem, emphasising the need for analysing DMVADSPS from the lens of a gig worker. Moreover, as a pioneering initiative unique in the country, DMVADSPS may set a precedent for other states.

Most Indian states rely on a mix of state-level incentives to pursue EV adoption, complementing the upfront subsidies provided under the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles Scheme (FAME - II).<sup>1</sup> These incentives include cheaper showroom prices, battery charging benefits, waivers on registration and road taxes, as well as incentives for retrofitment and scrapping old internal combustion engine vehicles (ICEVs).<sup>2</sup>

DMVADSPS stands out as a transition strategy that integrates both incentives and disincentives.<sup>3</sup>

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\*FAME - II expired on 31st March, 2024, to be replaced by the Electric Mobility Promotion Scheme (EMPS), which extends limited subsidy benefits for E2Ws and E3Ws, valid for four months from April 2024.



# Delhi Motor Vehicle Aggregator and Delivery Service Provider Scheme 2023

Under the DMVADSPS, the government of Delhi says businesses must compulsorily electrify their fleets by 2030, provided they own at least 25 vehicles that include two-, three- and four-wheelers. The scheme's key features are as follows.

- ➊ Introduction of electric bike taxis with legal recognition as a prerequisite for operation in the city.
- ➋ Implementation of phased electrification mandates for two-, three- and four-wheelers.
- ➌ Defining licensing criteria for aggregators offering passenger transport and delivery services. Licences are provided for five years, with an exemption from annual fees for EVs.
- ➍ Mandate for covered entities to procure Pollution Under Control (PUC) certificates and settle parking fines.
- ➎ Enforcement of monetary penalties for violations, ranging from ₹25,000 to ₹1,00,000 per instance.

DMVADSPS complements Delhi's EV policy, which places a strong emphasis on electrifying two-wheelers (2W). It incentivises E2W buyers with reduced upfront costs, scrappage benefits and waivers on road tax and registration fees.<sup>4</sup> Few other states including Maharashtra, Madhya Pradesh and Karnataka have defined electrification targets for delivery fleets. For example, Maharashtra aims to achieve 25 percent electrification of urban fleets operated by aggregators by 2025.<sup>5</sup> Madhya Pradesh targets complete electrification of commercial and logistical fleets by 2028.<sup>6</sup> Similarly, Karnataka has named 2030 as its deadline.<sup>7</sup>

Delhi's strategy uses a carrot and stick approach to accelerate EV adoption. This includes licence fee waivers for EV buyers and penalties for non-compliance through fines and cancellation of licenses. While such an approach can be effective in achieving policy objectives, its suitability in this context may be questioned for several reasons:

## Compliance Burden on Gig Workers

Often gig workers own and maintain the vehicles used for last-mile deliveries for e-commerce entities and aggregators. This means they are responsible for adhering to DMVADSPS mandates, such as switching to an EV, procuring PUC certificates and settling parking fines. In addition, gig workers bear the responsibilities of loan repayments, insurance, maintenance, and the costs of replacing vehicle components. They act as independent contractors rather than employees under the law which exempts

platforms from contributing to their social security.<sup>8</sup> As a result, penalties initially aimed at e-commerce delivery companies have a direct impact on gig workers who are left to bear the burden of transitioning to electric mobility.

## Range Anxiety

The inadequate EV charging infrastructure can lead to increased downtime during work hours for gig workers, resulting in potential revenue loss.<sup>9</sup> Delhi, despite being one of India's leading territories for EV infrastructure, still faces challenges with its limited charging network. As of April 2024, Delhi had 1886 operational public charging stations for 2.89 lakh EVs – an average of about one charging station for every 153 EVs, falling well behind the global average of at least one charging station per 20 EVs.<sup>10,11</sup> In India, while most E2Ws are charged at home, the presence of a wide public charging network is important to eliminate range anxiety.<sup>12</sup>

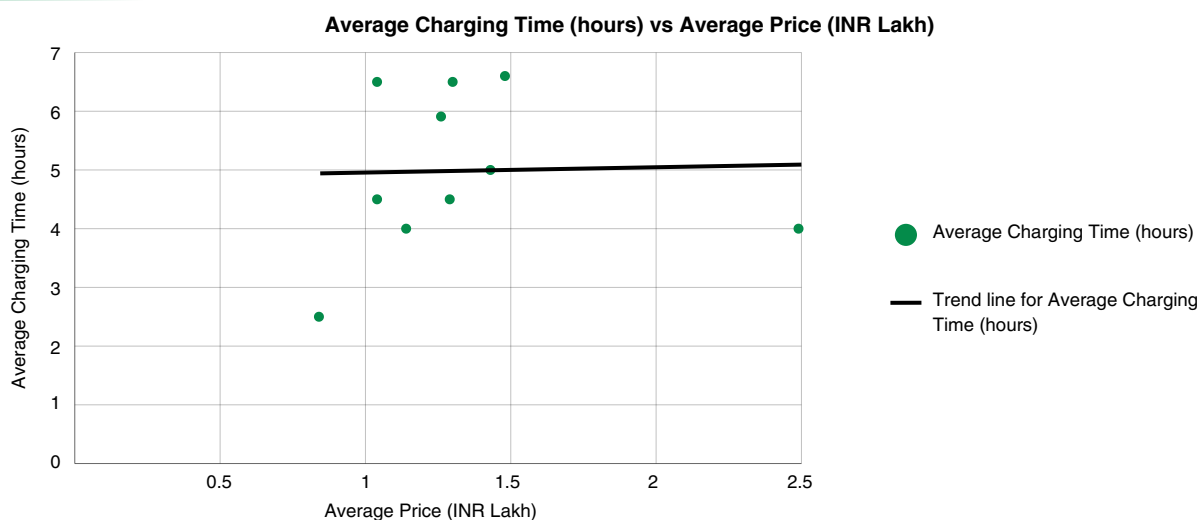
The range of an E2W per charge cycle is closely tied to its battery capacity. Given the typical daily commute of delivery riders in India is estimated to be 100 km, E2Ws with lower battery capacities may struggle to cover the distance without a dense charging network.<sup>13</sup> EVs capable of comfortably meeting this demand come at a significantly higher price than equivalent ICEVs.

Annexure C provides a comparative overview of 10 popular E2Ws in India, considering factors such as price, battery capacity, range, and charging time.

Data obtained from original equipment manufacturers' (OEM) websites reveals an intriguing correlation between the claimed range and prices. EV models offering a range of 100 kilometres or more come with a price tag of ₹1.1 lakh or higher. This aligns closely with the daily requirements of most delivery drivers who cover an average distance of 90-100 km per day, eliminating the need for a midday recharge. On the other hand, models priced below the ₹1.1 lakh threshold fall at least 20 km short of meeting the average daily requirements of drivers.

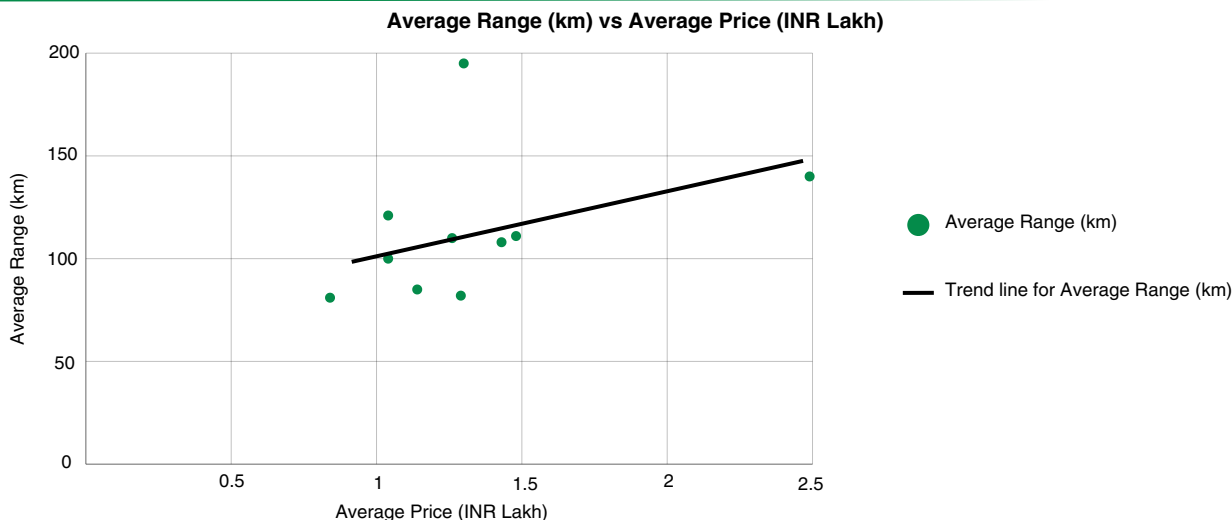
Figure 1 suggests almost no correlation between charging time and price of E2Ws. On the other hand, Figure 2 shows an overall positive correlation between average range and price of E2Ws.

Figure 1: Correlation between Average Charging Time and Average Price of E2Ws



Source: Various OEM portals (April 2024)

Figure 2: Correlation between Average Range and Average Price of E2Ws



Source: Various OEM portals (April 2024)

## Gaps in Financing

While national and state-level incentives have aimed to stimulate the demand for EVs, the absence of a comprehensive EV financing ecosystem remains a barrier to their widespread adoption. The availability of loans from banks and non-banking financial companies (NBFCs) is limited for EVs compared to ICEVs. For example, the interest rates on E2Ws can be one to four percent higher than those for ICEVs. This discrepancy is partly due to the shorter loan tenure, typically three years for an E2W compared to four years for an ICEV.<sup>14</sup>

Moreover, insurance options are constrained due to challenges in understanding new variables inherent in the EV industry such as battery depreciation and safety risks associated with lithium-ion battery technology. To mitigate potential losses, financiers offer lower loan-to-value (LTV) ratios,<sup>iv</sup> imposing higher interest rates, and shorter loan tenures aligned with battery warranties. Insurance companies also invite higher premiums on EVs as compensation. These conditions can pose financial strain on gig workers.<sup>15</sup>

## Potentially High Total Cost of Ownership

E2Ws may present a high TCO,<sup>ii</sup> potentially burdening gig workers. Factors contributing to this include uncertain resale value of used E2Ws, inadequate charging infrastructure and fewer financing options for new purchases.

Additionally, the wear and tear of lithium-ion batteries can impact TCO by reducing the driving range, increasing the charging time and maintenance costs. While the accurate timeline of battery degradation in EVs is not yet captured in available data, insights gained from around 5,000 scooters in Bengaluru and Chennai reveal that E2W retain about 93 percent of their capacity after 25,000 km of usage. This means, for a gig worker driving 100 km a single day, the battery will reach up to seven percent degradation within the first year of operation.<sup>16</sup>



While batteries can have a lifespan ranging from 10 to 20 years, they start showing noticeable signs of degradation after eight years or 1,60,000 km, often the standard threshold for automotive manufacturers to terminate battery warranties.<sup>17</sup> With a daily commute of 100 km, an E2W would cross this threshold only after four and a half years.

As a result, buyers must factor in the recurring capital expenditure for battery replacement every four to five years especially when faced with limited financing options. This is critical because the average loan repayment tenure for EVs is two to three years. Thus, gig workers are likely to remain in debt, potentially facing revenue losses due to compromised range per charge cycle.

Adding to the complexity, the resale value of the batteries remains uncertain in a developing recycling market. The resale value of a vehicle without a functional battery is also uncertain, further complicating the financial considerations for EV buyers.<sup>18</sup>

# Exploring Delhi's Used Two-Wheeler Market

## *Electric Two-Wheeler Market*

India boasts one of the world's largest two-wheeler (2W) markets, with 18 million units sold in 2022.<sup>19</sup> Electric two-wheelers (E2Ws) constituted just more than half of all electric vehicle (EV) sales in 2022, with projections estimating the market to reach 6.74 lakh vehicles by FY 2027.<sup>20</sup>

A survey by Borzo, a delivery service provider, revealed that many gig workers preferred E2Ws for last-mile deliveries. Among the 6,000 gig workers surveyed, over 75 percent already used E2Ws for deliveries. Of those yet to switch, 70.5 percent expressed readiness to adopt E2Ws in the future.

The decision-making factors behind these choices included considerable savings on fuel costs, lower rental expenses, quieter and smoother rides, as well as various charging incentives. More than half the respondents using EVs reported saving over 30 percent on monthly petrol expenses. Additionally, a notable 72.5 percent found EVs to offer a more comfortable riding experience than petrol-powered vehicles.<sup>21</sup>

Transitioning to EVs did present its set of challenges around difficulties in locating charging spots, concerns regarding battery range, and longer charging times compared to refuelling. Despite these challenges, the survey indicated a general preference towards E2Ws, driven by the immediate benefits of fuel savings and enhanced rider comfort.

To corroborate these findings, we conducted on-site research in Delhi's bustling Karol Bagh, the state's largest preowned 2W market. Interviews with automotive dealers revealed a vibrant market consisting of 50-60 shops predominantly dedicated to Internal combustion engine vehicles (ICEVs) - reaching up to ₹1,50,000 for premium models.

Personal mobility demands constituted the majority of the market share, followed by the commercial segment. Gig workers, in particular, showed a strong preference for budget offerings between ₹20,000 - ₹50,000.

A prominent dealership owner, also a key figure in the market's labour union, said he anticipates continued dominance of ICEVs in the used 2W market for the foreseeable future, estimating a timeline of at least five to six years.

In adjacent Jhandewalan, known for its cycle and toy market, a new wave of EV manufacturers is emerging. Brands such as Suzuki, Ather, Ola, Komaki and BLive are carving out their presence with offerings starting at ₹70,000 to premium variants reaching ₹1,50,000. Notably, the availability of insurance options for E2Ws remains limited, with few non-banking financial companies (NBFCs) participating.

Our research further revealed an evolving trend in business models among gig workers transitioning to electric mobility in Delhi, notably towards EV leasing.

Take for instance companies like Baaz Electric Mobility offering enticing monthly leasing options for around ₹6000/month. These vehicles are designed for commercial deliveries, engineered to withstand rigours of daily usage unlike their conventional counterparts.

What's more, riders do not need a licence to operate them, as they are speed-capped at 25 kmph.

Baaz vehicles boast a range of up to 50 km on a fully charged battery, further supported by their battery swapping designed to alleviate range anxieties. Riders can swap their batteries an unlimited number of times against their monthly rentals.

Moreover, when it comes to maintenance these vehicles demand minimal attention for at least 15 months of operation comparable to ICEVs under similar usage intensity. Baaz also provides comprehensive vehicle and battery insurance, as they retain ownership of all assets in the service.

We spoke to Shubham Srivastava, the co-founder of Baaz Mobility. He was optimistic about the future of the leasing business in the ecommerce segment. He highlighted the persistent challenges such as standardisation and the lack of interoperability in the battery swapping ecosystem.

Other brands like Yulu and Zipp also offer similar rental solutions, making leasing a popular choice among gig workers. In fact, during our discussions with gig workers in South Delhi, gig workers emphasised their preference for leasing as it eliminates the upfront cost of buying a new vehicle, and relieves them of the cost of charging, maintenance and vehicle insurance expenses, providing hassle-free and cheaper mobility.

# Delhi's place in the world: DMVADSPS in a Global Context

In the global context, DMVADSPS stands out as a unique initiative. Many countries rely on voluntary mechanisms to push EV adoption offering incentives such as free municipal parking, toll discounts, access to bus lanes and tax rebates. Countries often follow an S-curve growth pattern, a trajectory that reflects the adoption of innovative technologies, according to a report by the World Resources Institute (WRI), a global research non-profit. The trajectory tends to accelerate once a technology reaches a tipping point — such as when EVs become more cost-effective than ICEVs – leading to a surge in adoption. Eventually growth diminishes as the technology nears saturation.<sup>22</sup>

Globally, countries like China, US and Norway have emerged as rapid adopters of EVs. Their success in making EVs the preferred choice for car buyers can be attributed to three main factors:

Table 1: **Paving the way for EV Adoption**

Country	Government Incentives	Infrastructure Investment	Perks for EV Owners
Norway <sup>23</sup>	The government introduced incentives starting in the 1990s aimed at making EVs financially appealing. This included exemptions from high value-added and registration taxes. By around 2012, these incentives had a profound impact, as the lifetime TCO of EVs became more economical compared to ICEVs, even after factoring in tax breaks.	Norway boasts the world's highest number of public fast chargers, a feat achieved through significant state investments in charging infrastructure. In addition, rights to charge EVs in apartment buildings facilitated their widespread adoption across the country.	EV owners enjoy free city parking, exemptions or reductions in road tolls, access to priority bus lanes, and reduced ferry transportation rates.
China <sup>24</sup>	Between 2009-2022 the government spent over \$28 billion on EV subsidies and tax breaks, selling over six million EVs, or half of all global EV sales. It ended purchase subsidies in 2022, as the market matured.	The state offers discounted electricity tariffs for EV charging and battery-switching facilities, along with regulated service fees. Additionally, the costs of integrating EV charging and switching facilities into the grid are covered in generator tariffs for power transmission and distribution.	EV drivers are exempted from vehicle and vessel tax, parking fees, bridge and road tolls, compulsory insurance fees, and also receive preferential access to bus lanes. Additionally, in cities like Beijing, where obtaining a car licence plate usually involves long waiting times, the process is expedited for EV buyers.

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US	The country phased out tax credits for ICEVs in 2010, replacing them with a \$7500 tax credit for EVs. In 2022, the Inflation Reduction Act introduced two types of EV tax credits, either \$3750 or \$7500, with changed eligibility rules and extended the tax break until 2032. In addition, states like California offer their own tax credits, incentivizing the adoption of EVs. <sup>25</sup>	The Bipartisan Infrastructure Law allocates \$7.5 billion to support the installation of US-made EV charging stations. In addition, the National Electric Vehicle Infrastructure Programme aims to install public fast-charging stations at least every 50 miles along the nation's major travel routes. <sup>26</sup>	EV owners in parts of the country enjoy perks such as access to high occupancy vehicle (HOV) lanes, waived parking fees and toll discounts. In addition, manufacturers like Mercedes-Benz, Polestar, Porsche and Volkswagen offer customers up to three years of free charging at Electrify America charging stations. <sup>27</sup>
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Source: Various

The experiences of Norway, China and the US offer valuable insights for other countries. In each case, governments focused on enhancing cost competitiveness and developing a robust charging infrastructure, before transitioning away from incentives or penalties for potential non-compliance.

India has already launched national-level initiatives to promote the electrification of 2Ws and light-motor-vehicles (LMVs).<sup>iii</sup> These include Production Linked Incentive (PLI) for Automobile and Auto Components, PLI for Advanced Chemistry Cell (ACC) Battery Storage, FAME – II and Electric Mobility Promotion Scheme (EMPS) as highlighted in Annexure D.

FAME - II has emerged as a leading policy driver for the electric mobility agenda. While the scheme, in conjunction with PLIs has injected momentum into India's electric mobility ecosystem in terms of EV adoption and charging infrastructure expansion, its implementation has encountered several hurdles. For example, both FAME - II and PLI for ACC use battery capacity as a criterion for subsidy allocation, resulting in reduced subsidy disbursement to certain OEMs under FAME-II for budget two wheelers with smaller battery packs. Additionally, there are reports of subsidy misutilisation as a few OEMs exceeded the prescribed limit for importing components from China, diluting domestic value addition.<sup>28</sup>

With gaps in the implementation of national level subsidy programmes, and EV adoption yet to reach a substantial scale, it might be premature for states to take punitive policy measures. Without the requisite charging infrastructure, affordable financing and reliable TCO model, DMVADSPS can create an uncertain environment for the gig workers to operate in, without necessary safeguards.

# Recommendations

- 1 Integrating TCO considerations:** The TCO of E2Ws remains prohibitively high when factoring in the upfront cost, insurance and loan repayment expenses. Despite the focus on the 'low running cost per km,' the risks associated with post-ownership experiences often go overlooked. Therefore, the state of Delhi must adopt an enlightened approach by incorporating TCO considerations into its mandates for EV adoption. This is crucial given the apprehensions financial institutions face regarding EV battery life and the perceived risks associated with lending to EV buyers. The objective can be pursued by engaging in nuanced discussions with gig workers in the EV promotion strategy, which is currently missing in DMVADSPS.
- 2 An incentive-driven strategy for EV adoption:** Both state and central governments should prioritise incentives to ease financial burdens on intermediaries and gig workers. Examples from China and Norway prove how tax credits and subsidies can serve as catalysts for increasing EV adoption rates.
- 3 Alternative EV ownership models**

## Alternative Electric Vehicle (EV) Ownership Models for Gig Workers and Associated Challenges

**Retrofitment:** In Delhi, the government allows for the retrofitment of old petrol, CNG, and diesel vehicles into EVs. While retrofitment presents an attractive option compared to purchasing a new EV, it usually proves expensive. For instance, any popular internal combustion engine (ICE) two-wheeler in India, which costs between ₹55,000 - ₹94,000, can be retrofitted at roughly half the price of a new model. However, concerns regarding battery safety, certification, installation costs, and warranty coverage accompany retrofitment.<sup>29</sup>

**Battery Swapping:** Delhi government has set up 256 battery swapping stations across the city.<sup>30</sup> Battery swapping offers a solution to reduce the initial cost of the vehicle, as batteries constitute over 40 percent, or nearly half, of an EV's total price.<sup>31</sup> This model also cuts down the cost of ownership, minimises downtime and alleviates range anxiety when supported by a comprehensive network of swapping stations.

However, the widespread adoption of battery swapping faces hurdles such as lack of standardisation, diverse battery pack designs, short commercial battery life and safety considerations. To further develop this model, a Parliamentary standing committee has suggested a feasibility study on battery standardisation, and the creation of a Battery Swapping Policy.<sup>32</sup> The committee encourages swapping operators to invest in infrastructure and capacity building, attracting foreign direct investment (FDI) to establish a national battery swapping network. The government has also expressed interest in issuing quality control orders (QCOs) for battery swapping pending further industry consultations.<sup>33</sup>

**Mobility as a Service (MaaS):** EV leasing is another promising ownership model, freeing gig workers from upfront and maintenance costs. Several startups including Alt Mobility, eMatrixmile, Yulu, Zypp Electric and Baaz Bikes have ventured into this space. Through EV leasing, lessees make a down payment to the leasing company, followed by fixed monthly payments for the agreed lease duration, typically spanning two to five years. Some original equipment manufacturers (OEMs) include service and maintenance packages within the lease, while other rental firms handle all service and maintenance throughout the contract period, sparing customers additional charges.

**Battery as a Service (BaaS):** Under the BaaS model, buyers cover the initial vehicle cost and opt for a monthly lease payment specifically for the battery. This approach aims to address the reluctance among banks and non-banking financial companies (NBFCs) to finance EVs due to the rapid depreciation of lithium-ion batteries. Structured payment plans under the leasing model make it more feasible for financiers to offer lower finance costs to customers. Moreover, lessors are obliged to replace degraded batteries with higher-quality ones, extending the vehicle's lifespan.<sup>34</sup>

However, among all these models, ***battery swapping and retrofitment confront uncertainties regarding insurance coverage.*** The lack of standardised quality certification and safety protocols in the ecosystem limits their reliability for insurance companies. In fact, trends suggest that a few battery swapping companies are transitioning towards leasing models due to slow growth in the battery swapping sector.

# Annexure A: DMVADSPS and Delhi Electric Vehicles Policy

## Features of the DMVADSPS<sup>35</sup>

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- 1 Applicability**
  - DMVADSPS scheme is applicable to aggregators, delivery service providers, and e-commerce entities that possess at least 25 motor vehicles including two, three, and four wheelers.
  - Entities covered in this scheme are expected to declare on-boarded vehicles and obtain a licence within 90 days from the time of notification, which will be valid for three years.
- 2 Targets**
  - 10 percent electrification of new fleet addition within six months
  - 25 percent electrification new fleet addition within one year
  - 50 percent electrification new fleet addition within two years
  - 75 percent electrification new fleet addition within three years
  - 100 percent electrification new fleet addition within four years
  - Ensuring 100 percent fleet electrification by April 1, 2030. Failing to meet this mandate will lead to penalties between ₹25,000 and ₹1,00,000 or termination of the licence.
  - Ensuring proper parking for all vehicles in the National Capital Region (NCR).
  - Ensuring the validity of PUC certificates on behalf of gig workers.
- 3 Licence Fee**
  - The scheme mandates a higher licence fee for conventional vehicle registration over an EV. For instance, the fee for E2Ws is ₹0, while for a Petrol 2W it is ₹250 per vehicle.
  - All licence fees and penalties are to be credited to the State EV Fund to support EV infrastructure.

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Source: Delhi Government



### Salient Features of **Delhi EV Policy**<sup>36</sup>

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1. Purchase incentives of ₹5,000/- per kWh of battery capacity, capped at ₹30,000 per vehicle.

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2. Incentive of up to ₹5000/- for scrapping old ICEV.

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3. Interest subvention of five percent on loans for e-autos, e-rickshaws, e-carts and goods carriers (not applicable for 2Ws).

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4. Road tax and registration fee waiver.

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5. Establishment of a wide network of charging and battery swapping stations.

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6. Administrative reforms including the constitution of the State Electric Vehicle Board, establishment of a dedicated EV cell, and awareness campaigns on EVs.

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7. Establishments of skilling centres to support creation of jobs in the EV industry.

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8. Setting up a recycling ecosystem for EVs.

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9. Creation of 'State EV Fund'.

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Source: Delhi Government

# Annexure B: Electric Two-Wheeler Financing

## Financing for **Commercial Vehicles**<sup>37</sup>

Category	E2W (Low Speed)	E2W (High Speed)	ICE 2W
Interest Rate Differential (Banks)	-	1-9 percent higher than ICE 2W	
Interest Rate Differential (NBFCs)	2-3 percent higher than ICE 2W		
Tenure (Months)	12-18	12-24	12-24
LTV Ratio (Percentage)	65-70	75-80	75-80

Source: NITI Aayog

## Financing for **Personal Vehicles**<sup>38</sup>

Category	E2W (Low Speed)	E2W (High Speed)	ICE 2W
Interest Rate Differential (Banks)	1-4 percent higher than ICE 2W		
Interest Rate Differential (NBFCs)	1.5-3 percent higher rates than ICE 2W		
Tenue (Months)	12-18	24-36	48
LTV Ratio (Percentage)	65-75	75-80	Up to 95

Source: NITI Aayog

# Annexure C: Popular Electric Two-Wheelers in India

Specification Comparison between Popular E2Ws in India

S.No.	Popular Models	Prices as of April 2024 (INR Lakh)	Battery Capacity (KWh)	Range per Charge Cycle (km)	Charging Time (hours)
1.	Ola Electric S1 Pro	1.3	4	195	6 hours 30 minutes
2.	Ather 450X	1.48	2.7	111	6 hours 36 minutes
3.	TVS iQube S	1.04	3.04	100	4 hours 30 minutes
4.	Hero Vida V1 Pro	1.26	3.94	110	5 hours 55 minutes
5.	Bounce Infinity E1	1.14	1.9	85	4 hours
6.	Hero Electric Optima CX	1.29	1.5	82	4 hours 30 minutes
7.	Ampere Magnus EX	1.04	2.295	121	6-7 hours
8.	TVS X	2.49	4.4	140	4 hours
9.	Bajaj Chetak	1.43	3	108	5 hours
10.	Okinawa Praise Pro	0.84	2.08	81	2-3 hours
<b>Average</b>		<b>1.33</b>	<b>2.88</b>	<b>111.3</b>	<b>5</b>

Source: Various OEM portals, April 2024

# Annexure D: Global Initiatives Promoting Two-Wheeler Adoption

## Countries Promoting E2W Adoption



**Indonesia's** Electric Motorcycle Conversion Programme sets ambitious targets to convert 50,000 ICE 2Ws into EVs by 2023 and 150,000 by 2024.<sup>39</sup> The conversion process is overseen by government-approved workshops, ensuring quality and standardisation. The government also provides financial support for the conversion process and setting up battery swapping infrastructure to support the ecosystem.<sup>40</sup>



Incentives for EV drivers consist of free parking in central Copenhagen, **Denmark**, as well as exemption from registration fee and scooter property tax.



Electric scooter drivers are allowed to travel toll-free **Norwegian** motorways and may access preferred lanes on public transport routes. Additionally, they are exempt from purchase tax, value added tax, as well as registration fee and annual circulation tax.



In 2018, companies such as Lime, Dott, and Tier in **France** introduced around 15,000 e-scooters as part of a micro-mobility rental solution that gained immense popularity. However, a few years later, e-scooter riders were observed frequently disregarding traffic rules and riding on pavements. As a result, they were banned starting September 2023.<sup>41</sup>

Sources: Various

## National schemes to promote EVs

Scheme	Key Objectives
PLI AAC <sup>42</sup>	<ul style="list-style-type: none"> <li>Address cost challenges associated with manufacturing advanced automobiles including EVs and EV components;</li> <li>Maximising domestic value addition within the industry;</li> <li>Drive technological and value upgrading throughout the supply chain.</li> </ul>
PLI ACC <sup>43</sup>	<ul style="list-style-type: none"> <li>Establish giga-scale ACC and battery manufacturing facilities;</li> <li>Maximising high-end manufacturing domestically.</li> </ul>
FAME - II <sup>44</sup>	<ul style="list-style-type: none"> <li>Boost the adoption of E2Ws, E3Ws, E4Ws, as well as electric buses through demand incentives;</li> <li>Subsidising the development and expansion of charging infrastructure.</li> </ul>
EMPS <sup>45</sup>	<ul style="list-style-type: none"> <li>Promote E2Ws and E3Ws through short-term demand incentives.</li> </ul>

Source: Ministry of Heavy Industries

# Glossary

[i] The term 'gig worker' in this paper refers to an individual executing last-mile deliveries of goods for e-commerce businesses.

[ii] TCO includes various factors such as the initial purchase price, loan interest rates, insurance cost, battery replacement expenses, charging fees, and maintenance costs associated with an EV.

[iii] Light motor vehicles: Small, lightweight passenger and goods vehicles up to 7,500 kg gross weight including hatchbacks, sedans, small sports utility vehicles (SUVs), taxis, tempos, vans and small pickup trucks.

[iv] Loan to value (LTV) Ratio: Proportion of an asset's value that a lender is willing to provide debt financing against.

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