EVreporter.com

NRI

FLEET ELECTRIFICATION

Trends & Strategies in India

Prepared By

Nomura Research Institute Consulting and Solutions India Private Limited

ELECTRICON 2025
EV BUSINESS CONFERENCE & EXHIBITION

Table of Contents

Foreword

Priyakshi Gupta

Co-Founder and Editor
EVreporter

At EVreporter, we are excited to host Electricon 2025 - EV Business Conference & Exhibition. This marks the second edition of our annual industry conference, following its successful launch last year. We are pleased to release this industry report, prepared by our esteemed knowledge partner, Nomura Research Institute Consulting & Solutions India Pvt. Ltd, in conjunction with this event.

Electricon conferences are designed to facilitate networking opportunities and foster open dialogue about the clean mobility ecosystem. This year's theme is centred on commercial EV fleets, emphasising mass adoption and ecosystem development for various use cases, including quick commerce deliveries, last-mile and mid-mile logistics, deployment of heavy vehicles, and ride-hailing services.

The report offers a comprehensive analysis of the current landscape and future trajectory of fleet electrification in India. It serves as a crucial resource for stakeholders looking to navigate the opportunities and challenges surrounding fleet electrification. The analysis presented in this report is timely and relevant, capturing the essence of a rapidly evolving market.

We would like to extend our gratitude to the industry leaders and stakeholders who shared their time and insights, contributing to the curation of this report. We also express our appreciation to the dedicated team at Nomura Research Institute for their extensive research, analysis, and compilation, which resulted in this insightful document representing collective industry intelligence.

We hope that the Electricon conferences and their content will continue to empower decision-makers to make timely and informed choices in their individual and organisational journeys toward large-scale clean mobility.

Vineet Jain

Partner & Group Head, Automotive Industry Consulting Buisness Unit
NRI Consulting & Solutions India Pvt Ltd

India's transport sector stands at the edge of its most profound transformation since the arrival of diesel locomotion. As cities struggle with air-quality alerts and fleet operators wrestle with fuel volatility, electrification offers a proven path to cleaner streets and stronger balance-sheets. Over two million electric vehicles now roll off Indian roads each year, yet the real inflection point is unfolding in commercial transport. Buses, trucks, delivery vans and three-wheelers clock far higher daily kilometres than private cars, so every diesel kilometre we replace with electricity multiplies economic and environmental gains.

Policy is moving first. The PM E-Drive programme has extended incentives to e-trucks and ambulances, while state transport undertakings have committed to tens of thousands of e-buses. Infrastructure is following quickly: public fast-chargers exceed 26,000 units, and oil-marketing companies are co-funding highway megawatt hubs. Meanwhile, Indian suppliers are localising motors, battery packs and controllers under Production-Linked Incentive schemes, buffering the nation against global supply shocks and creating green manufacturing jobs.

Yet capital and capability remain as critical as technology. Uptime-linked leasing, battery-as-a-service and data-driven maintenance are rewriting fleet economics, while nationally recognised training pipelines are producing the technicians who will keep high-voltage trucks on the road. Taken together, these levers position India to reach 30 percent electric CV sales by 2030 and to lead the Global South in zero-emission logistics.

In this report titled "Fleet Electrification: Trends & Strategies in India", we delve into the status, trends, and future potential of electric commercial vehicles in India. Our research provides valuable insights for policy formulation and implementation based on industry perspectives.

We extend our gratitude to all stakeholders, including the government, industry players, academia, and prospective users, whose collaboration has made this research possible. We hope this report serves as a valuable resource in advancing sustainable fleet electrification in India and accelerates the nation's journey towards a cleaner and greener transportation ecosystem.

Preetesh Singh

Specialist, CASE and Alternate Powertrains
Automotive Industry Consulting Buisness Unit
NRI Consulting & Solutions India Pvt Ltd

“Fleet Electrification: Trends & Strategies in India” distils diligent research, data corroboration and numerous stakeholder interviews into a single, practitioner-ready guide. The report opens with a panoramic view of India’s EV market, tracing the surge from two- and three-wheelers to the emerging wave of medium- and heavy-duty trucks. It then dissects the regulatory framework - central incentives, state policies and grid codes - that shapes investment decisions across the value chain.

Subsequent chapters dive into infrastructure realities: charger density along freight corridors, depot power-draw challenges, and the march toward CCS-II standardisation. A dedicated section analyses financing models - ownership, leasing, subscription - using total-cost-of-ownership scenarios to show when each pathway wins. Readers will also find relevant cases on data analytics, predictive maintenance, and driver-training programmes that lift fleet uptime by double digits.

Importantly, the report closes with a roadmap that aligns vehicles, skills, infrastructure and policy milestones in three phases—Kick-start (2024-26), Scale-up (2027-30) and Maturity (2031-35). Each phase lists concrete actions for fleet operators, OEMs, financiers and utilities, supported by evidence from pilots already on Indian roads. Our objective is simple: equip decision-makers with clear, quantified insights that turn the promise of commercial electrification into day-to-day operational reality.

In our "recommendation" section, we touch upon strategic recommendations after detailed stakeholder consultations for making fleet electrification a success through interventions from policymakers, industry leaders, and investors. Our goal is to sensitize about immense opportunities in the sector and support the acceleration of fleet electrification.

We hope this report serves as a valuable resource, providing a detailed analysis of the status, challenges, and future opportunities in India's fleet electrification. By doing so, we aim to contribute to the ongoing efforts to consolidate sustainable and efficient commercial fleet ecosystem that meets the needs of the future.

1. India's Commercial EV Ecosystem: An Overview

The global electric vehicle (EV) market has seen substantial growth driven by several pivotal factors. As of 2024, global EV sales reached approximately 28.3 million units, marking an 18% increase from 2023 and showcasing a steady upward trajectory projected to reach approximately 75 million units by 2030.

Electric Vehicle (EV) sales share has been growing across various vehicle segments- 2 & 3 Wheelers, Cars, Buses, and Trucks- in key global markets (China, France, Germany, India, the United Kingdom, and the USA).

Figure 2 highlights substantial differences in EV adoption rates among segments and markets, reflecting varied levels of market maturity, regulatory support, and consumer acceptance across regions.

Figure 1. Global EV Sales Outlook

Total Global EV Sales in Million Units

*P: Projected (Under STEPS: Stated Policies Scenario)

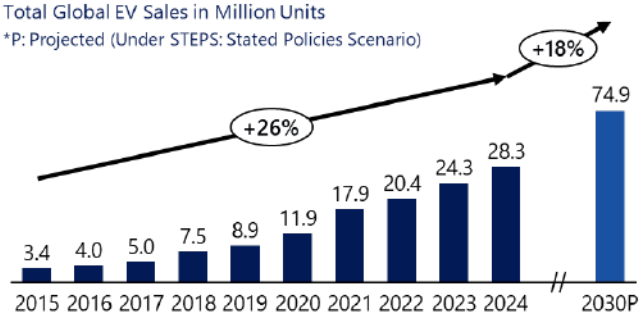
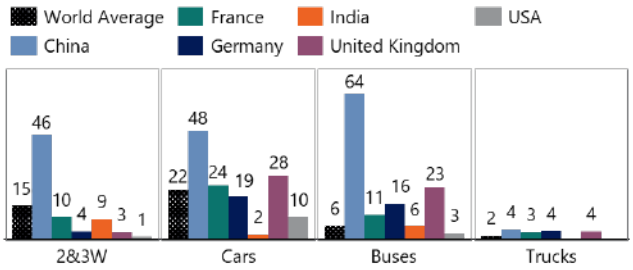


Figure 2. Segment-wise EV Sales Share

EV Sales Share in %, CY 2024



Source: IEA Global EV Data Explorer, Updated on 14 May 2025 (Accessed on 3 Jul 2025), NRI Analysis

2 & 3 Wheelers:

China leads significantly with an EV sales share of 46%, considerably higher than the global average of 15%. India follows with a modest share of 9%, reflecting emerging market growth driven by policy incentives and urban mobility demand. Other markets, including Germany (4%), the United Kingdom (3%), and the USA (1%), have relatively low penetration rates, indicating growth potential in this segment.

Cars:

China maintaining dominance in volume and overall market presence by leading the EV penetrations with (48%) followed by United Kingdom (28%) and France (24%) demonstrate notably high EV penetration, exceeding the global average of 22%, driven by robust government incentives, infrastructure investments, and consumer awareness. Germany (19%) and the USA (10%) display varying degrees of EV adoption. India's adoption remains modest at just 2%, highlighting considerable potential for growth through targeted policy initiatives and infrastructure expansion.

Buses:

China overwhelmingly dominates with an exceptional 64% EV sales share, far surpassing the global average of 6%, underscoring a strong push toward electrifying public transport. The United Kingdom also presents a notable performance at 23%, supported by policy frameworks promoting zero-emission public transport. Germany (16%) and France (11%) maintain moderate shares, reflecting a steady adoption rate. In comparison, India (6%) and the USA (3%) remain at relatively lower levels, suggesting opportunities for strategic intervention and infrastructure enhancement.

Trucks:

EV penetration in trucks is limited across all regions, with the global average standing at a modest 2%. China, Germany and the UK exhibit marginally higher adoption at 4%, while France, India, and the USA report very low EV sales shares ranging below 3%. This suggests significant barriers in this segment, such as battery limitations, infrastructure constraints, and economic factors, highlighting areas requiring strategic technological breakthroughs and policy-driven incentives for improvement.

Overall, EV adoption patterns demonstrate clear regional strengths and segment-specific trends owing to the following growth drivers:

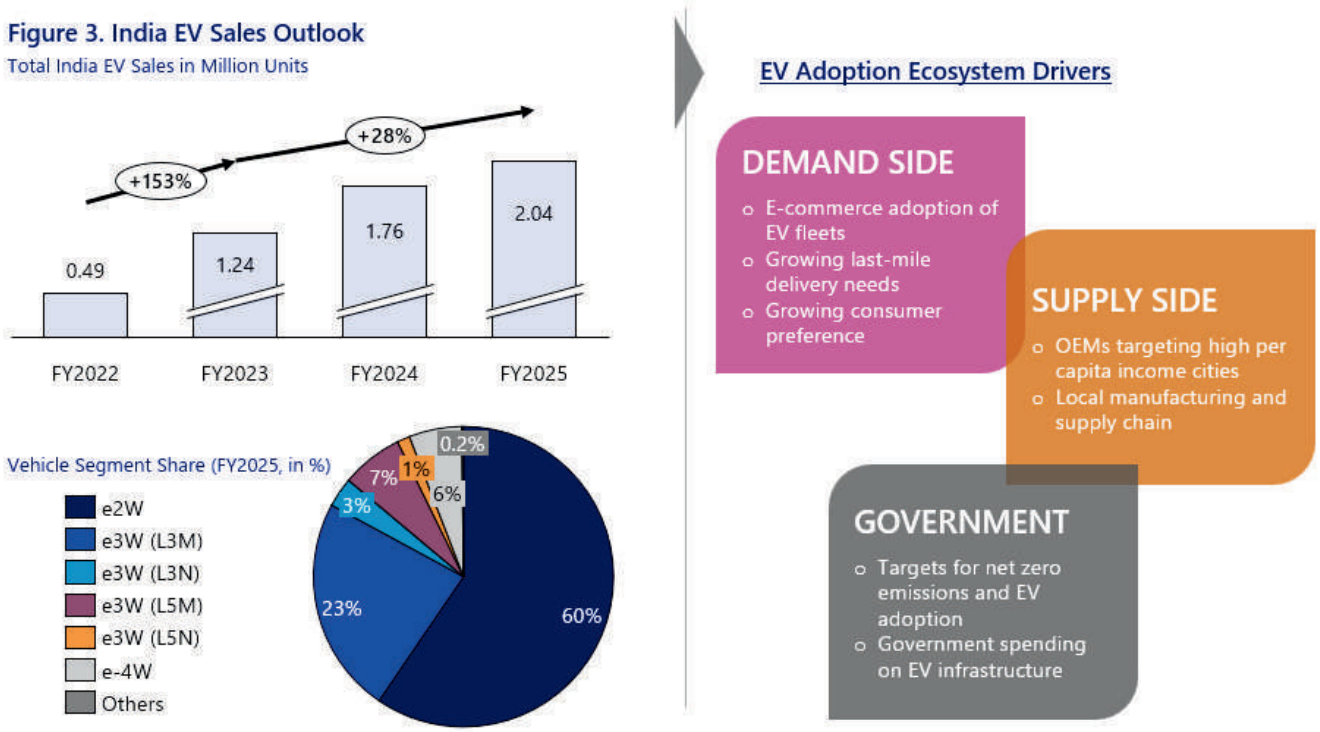
Subsidies, tax exemptions, and stringent emissions standards are instrumental in making EVs more economically attractive.
China's dominant position, particularly in 2&3 wheelers and buses via its entry in growing markets such as Brazil, Mexico, and Southeast Asia.

Technological progress in battery technology, has led to a significant drop in battery prices globally thus leading to a reduction in electric car prices in markets across the globe.

1.1 Current State of Electric Vehicles (EVs) in India

India's total EV sales have witnessed significant growth, increasing from 0.49 million units in FY22 to 2.04 million units by FY25. This trajectory represents a rapid escalation, marked by a notable 153% increase between FY22 (0.49 million units) and FY23 (1.24 million units). Growth momentum continues strongly thereafter, with a growth of 28% from FY24 (1.76 million units) to FY25 (2.04 million units).

The vehicle segment share for India's EV market in FY25 reveals a clear dominance of electric 2-wheelers (e2W), which are expected to account for 60% of total EV sales. This reflects strong consumer demand for affordable and efficient personal mobility options, especially in urban areas.



Source: VAHAN Dashboard Data (accessed on 3 July 2025), NRI Analysis

Electric 3-wheelers (e-3W) collectively make up a substantial 34% of the market, with the L3M category contributing the most at 23%, followed by L5M (7%), L3N (3%), and L5N (1%). These vehicles are increasingly being adopted for both passenger and goods transport, particularly in last-mile connectivity.

Electric 4-wheelers (e-4W) have also gained momentum and constitute 6% of the total EV sales, though challenges such as higher costs and infrastructure constraints still need to be resolved.

The remaining 0.2% falls under 'Others', indicating limited penetration of EVs in heavier vehicle categories such as buses and trucks. Overall, India's EV market in FY25 is expected to remain heavily skewed toward smaller vehicle segments, driven by affordability, ease of use, and supportive policy measures.

1.2 Commercial EV Market Size and Growth Trajectory

India's commercial electric vehicle (eCV) market is undergoing a significant transformation, propelled by a combination of policy support, fuel cost volatility, and the growing push for sustainable logistics and public transport solutions. The market spans a broad spectrum of vehicle categories, including electric 2-wheelers (e2Ws), 3-wheelers (e3Ws), 4-wheelers (e4Ws), and electric buses and trucks, each catering to different commercial use cases such as last-mile delivery, passenger mobility, public transport, and freight.

Over the last few years, e2Ws and e3Ws have taken the lead in electrification, especially in urban logistics and ride-hailing, due to their low upfront costs as compared to heavy vehicles. This is reflected in strong adoption by major delivery platforms, fleet operators, and state governments. The rise of e3W cargo and passenger variants has been notable in both Tier 1 and Tier 2/3 cities.

Meanwhile, electric buses have emerged as the face of public-sector-led electrification, with multiple state transport undertakings adopting them under schemes like FAME-II, PM E-Drive and the National Electric Bus Programme (NEBP). Adoption of electric trucks and e4W commercial fleets, such as vans and light-duty goods vehicles, remains in a nascent stage but shows growing interest from corporates pursuing net-zero goals and green logistics.

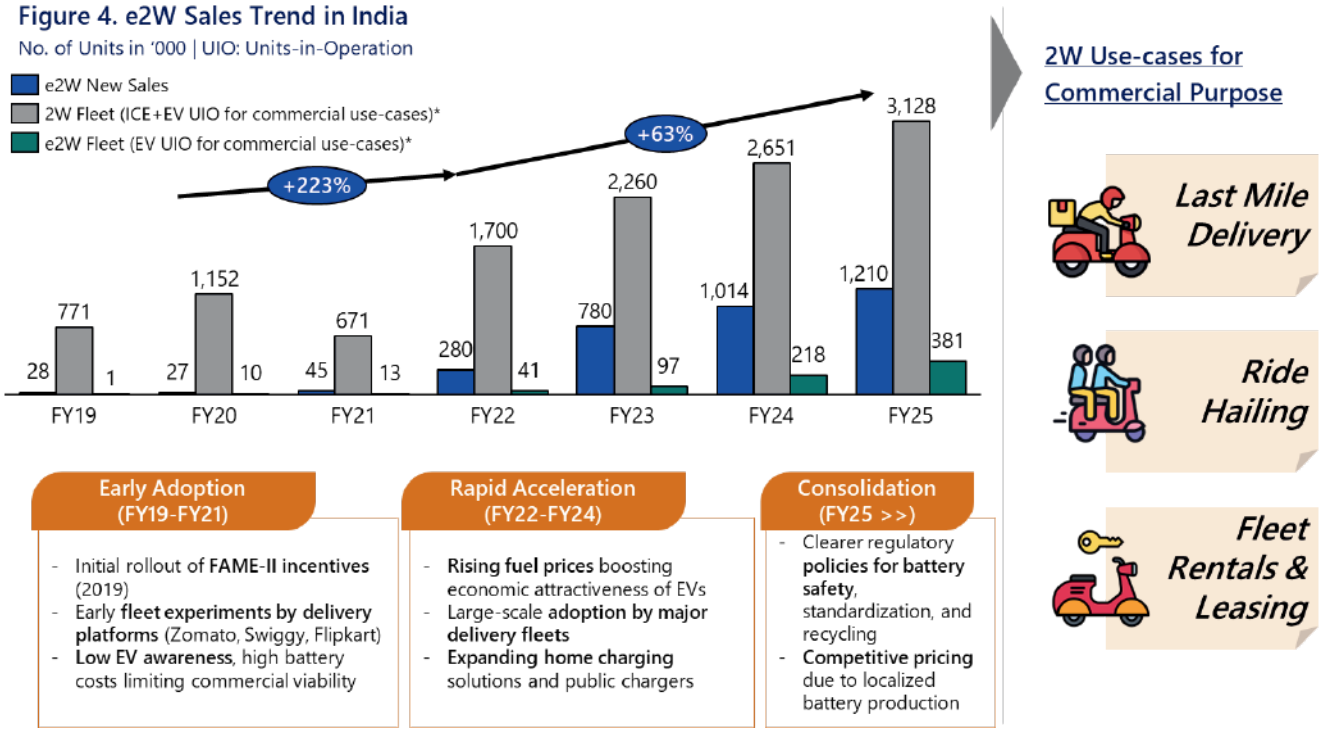
Key growth enablers include:

- Regulatory momentum, such as state EV policies, demand incentives, and scrappage-linked benefits.
- Total Cost of Ownership (TCO) parity, which many commercial segments are beginning to achieve faster than private ones.
- Battery cost reduction and localization, making vehicles more affordable and maintenance-friendly.
- Expansion of charging/swapping infrastructure, particularly for fleet hubs and high-utilization vehicles.

The focus now is on scaling deployment, improving vehicle uptime, and building integrated ecosystems for commercial EVs across urban and rural India.

Electric Commercial Vehicles Growth Trends: e2W

In recent years, India has become one of the fastest growing markets for e2W, driven by government incentives (like FAME-II), rising fuel prices, growing consumer awareness, and a strong push from startups and established OEMs. The entry of traditional players, such as Honda, TVS & Bajaj, and non-traditional players, including Ola Electric & Ather Energy, has introduced technologically advanced e2W models that appeal to both urban youth and commercial fleets.



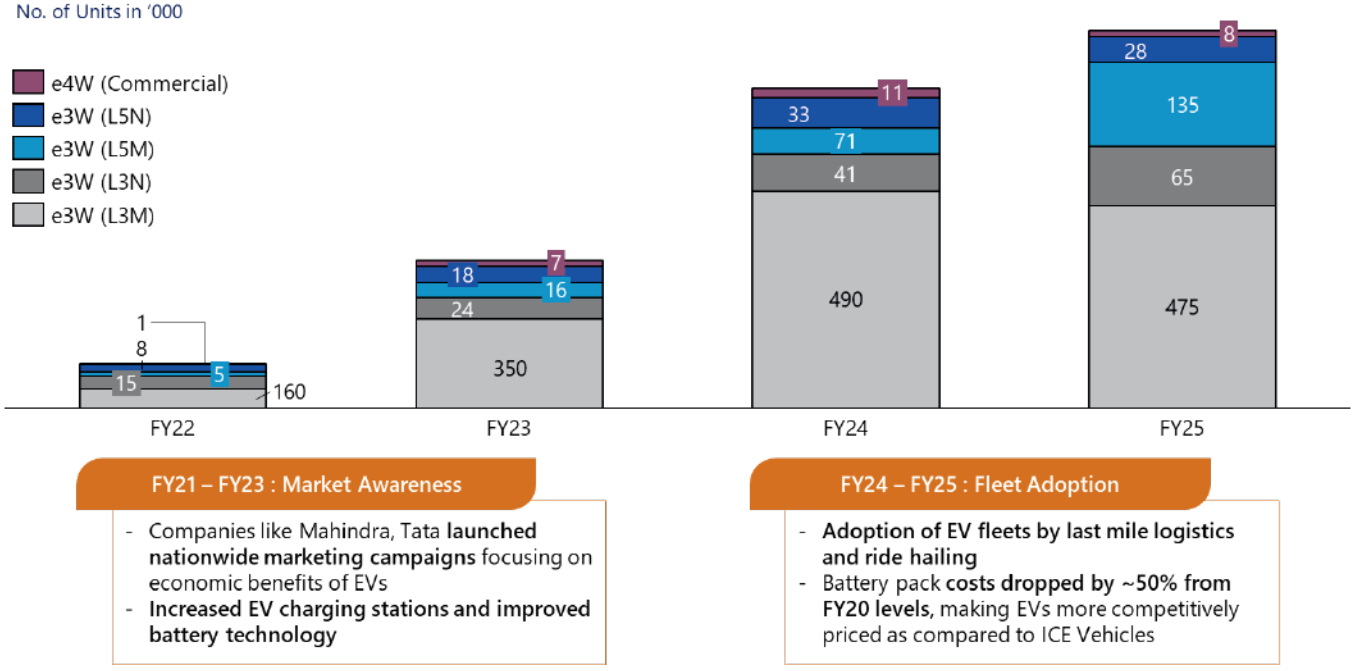
Source: VAHAN Dashboard Data (accessed on 3 July 2025), *NRI Estimates

Electric Commercial Vehicles Growth Trends: LCV (e3W & e4W)

Between FY22 and FY25, India's electric commercial 3-wheeler (eC3W) and 4-wheeler (eC4W) market saw rapid growth driven by rising fleet adoption in last-mile logistics and ride-hailing. Initially led by market awareness campaigns (FY21–FY23) from players such as Mahindra and Tata, the market entered a fleet-driven phase (FY24–FY25), supported by a significant drop in battery pack costs compared to FY20 and the expansion of charging infrastructure. e3Ws, particularly L3M and L5M types, dominated the shift, while e4Ws also gained traction in commercial fleets, marking a clear move toward operational scale.

Figure 5. eC3W, eC4W Sales Trend in India

No. of Units in '000



FY21 – FY23 : Market Awareness

- Companies like Mahindra, Tata **launched nationwide marketing campaigns** focusing on economic benefits of EVs
- **Increased EV charging stations and improved battery technology**

FY24 – FY25 : Fleet Adoption

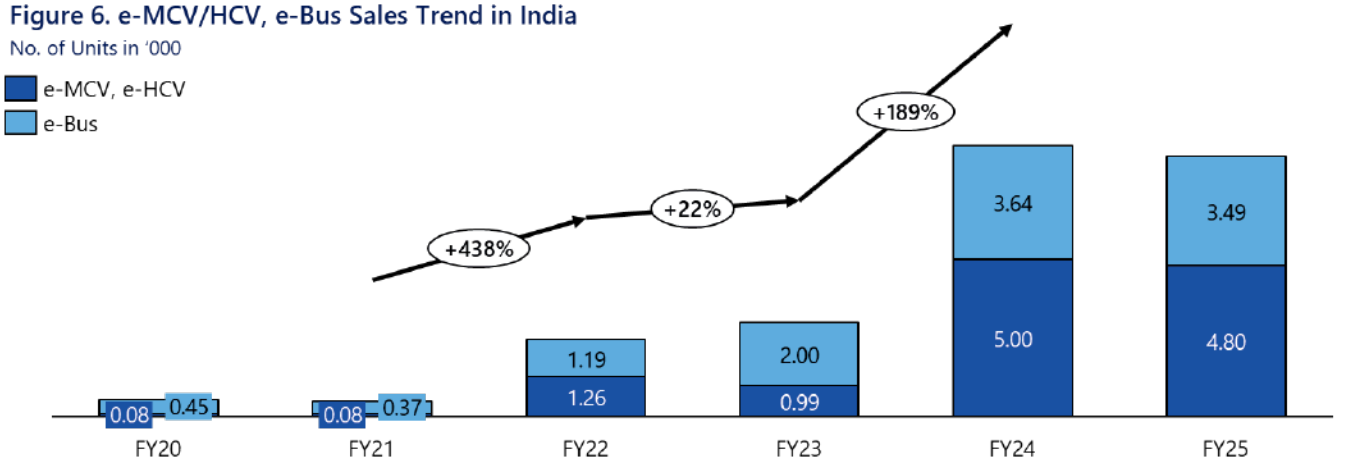
- **Adoption of EV fleets by last mile logistics and ride hailing**
- Battery pack **costs dropped by ~50% from FY20 levels**, making EVs more competitively priced as compared to ICE Vehicles

Source: VAHAN Dashboard Data (accessed on 3 July 2025), NRI Analysis

Electric Commercial Vehicles Growth Trends: MCV/HCV

Figure 6. e-MCV/HCV, e-Bus Sales Trend in India

No. of Units in '000



FY20 – FY21: COVID-19 Impact

- **Slower growth** due to market recovery from COVID-19 and **bullish focus on electrifying Light Vehicles (2W, 3W)**
- **Limited charging infrastructure and high initial costs**

FY21 – FY23: Cost Efficiency

- **FAME-II scheme's fleet electrification** programs
- **Reduction in operational costs** (lower fuel cost/maintenance)
- **Weak charging infra & Supply Chain inefficacy** roadblocks

FY24 – FY25: Growing Adoption

- **PM E-Drive roll-out**
- **Continued fleet electrification** by large logistics firms & public transport operators, Govt. push for **sustainable freight solutions**
- **Semiconductor and component shortages** began easing by FY24

Source: VAHAN Dashboard Data (accessed on 3 July 2025), NRI Analysis

India's e-MCV/HCV and e-Bus market experienced a sharp rise from FY22 to FY25, with total sales increasing from 2.45K units in FY22 to 8.29K units in FY25, driven by a 189% growth between FY23 and FY24 alone.

After slow progress during COVID-19 (FY20–FY21), growth picked up in FY21–FY22, mainly driven by policies such as FAME-II and PM E-Drive.

1.3 Key Stakeholders and Ecosystem Players

India's EV ecosystem has evolved into a multi-stakeholder landscape, with each segment playing a distinct role in accelerating electric mobility adoption. As of FY25, the cumulative private equity and venture capital (PE/VC) investment in the EV sector has reached approximately $9.06 billion, reflecting strong investor confidence across multiple value chains.

1. Auto OEMs (Original Equipment Manufacturers):

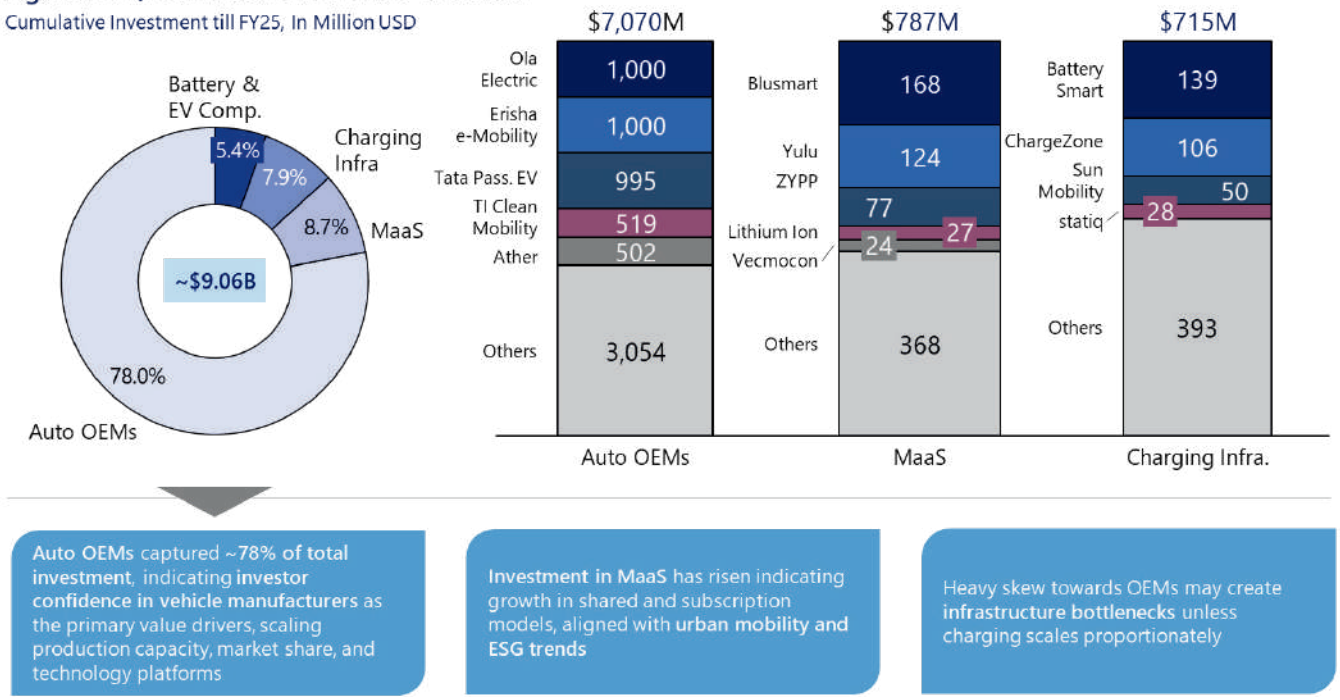
Capturing nearly 78% of total PE/VC investment (~$7.1B), OEMs remain the cornerstone of India's EV market. Major players like Ola Electric, Tata Passenger EV, and Ather have attracted significant capital to scale manufacturing, strengthen technology platforms, and expand market presence. This investment skew reflects high confidence in vehicle production as the primary value driver, but also underscores the need to balance infrastructure investment to avoid future bottlenecks.

2. Mobility-as-a-Service (MaaS):

MaaS has attracted $787M in funding (8.7% of the total), signalling rising interest in shared and subscription-based mobility models aligned with ESG goals and urban congestion challenges. The segment benefits from increasing demand for low-TCO, app-based transport options in urban centres.

Figure 7. PE/VC Investment In India EV Sector

Cumulative Investment till FY25, In Million USD



Auto OEMs captured ~78% of total **investment**, indicating **investor confidence in vehicle manufacturers** as the primary value drivers, scaling production capacity, market share, and technology platforms

Investment in MaaS has risen indicating growth in shared and subscription models, aligned with **urban mobility and ESG trends**

Heavy skew towards OEMs may create **infrastructure bottlenecks** unless charging scales proportionately

Source: Traxcn, Pitchbooks

3. Charging Infrastructure:

With $715M invested (~7.9% of total), charging infrastructure is emerging as a critical enabler of EV adoption. Companies like Battery Smart, ChargeZone, and Statiq are working to address scalability, access, and standardization challenges.

4. Battery and EV Component Manufacturers:

Accounting for just 5.4% of total investment, this segment is vital for domestic value creation and long-term cost reduction. While current funding remains limited, localization efforts and supply chain integration are expected to drive future growth.

Way forward: Stakeholder Perspectives

Rakesh Dasari
Program Manager,
VoltUp

- *Over the next five years, India's commercial EV market will move from early adoption to mass-scale integration—driven not just by cost, but by an ecosystem solving real challenges for gig workers and logistics operators. Rapid growth in quick commerce, e-commerce, and urban freight is fueling demand for affordable, purpose-built EVs that are easy to maintain and quick to recharge or swap.*
- *With supportive policies, financing innovation, and rising private investment, the question is no longer "if," but "how fast and how effectively" India can scale. The winners will be those who combine smart tech with deep ecosystem integration and rider-first thinking.*

- *India's commercial EV segment will see strong growth led by 2W/3W logistics and mid-mile freight solutions. We expect OEMs to adopt modular and scalable platforms and government stakeholders to bridge gaps in financing and infra. Tier 2/3 cities will drive demand, and fleet operators will be major early adopters.*

Pranav Nagaveykar
Founder,
XLEX Batteries

Dr. Rashi Gupta
Managing Director
Vision Mechatronics

- *The Indian commercial EV market is set for massive growth over the next five years, driven by government support, rising fuel costs, and a strong push for sustainability. We'll see rapid adoption, especially in light commercial vehicles (LCVs) and 3-wheelers for last-mile delivery, with electric buses also expanding quickly. Heavy commercial vehicles (HCVs) will increasingly electrify for regional logistics.*

Kashthuri
23 Electric Mobility

- *Retrofit support and infra expansion subsidies are key. Also, clear policies on rare earth material sourcing and global tech partnerships are needed*
- *Charging infrastructure must be placed intelligently. Battery swapping makes sense for 2Ws and 3Ws, but not beyond*

- *To scale fleet electrification, policies must shift from vehicle subsidies to operational enablers:*
  - ***Uptime-linked incentives** tied to km run or deliveries made.*
  - ***Credit guarantees** to de-risk EV loans for 3PLs and gig workers.*
  - ***Uniform EV norms** and fast-track approvals across states.*
  - ***MSME support** for local EV fleet operators via interest subvention.*

Avesh Memon
Founder & CEO,
Rilox EV &
Rilox E Mobility

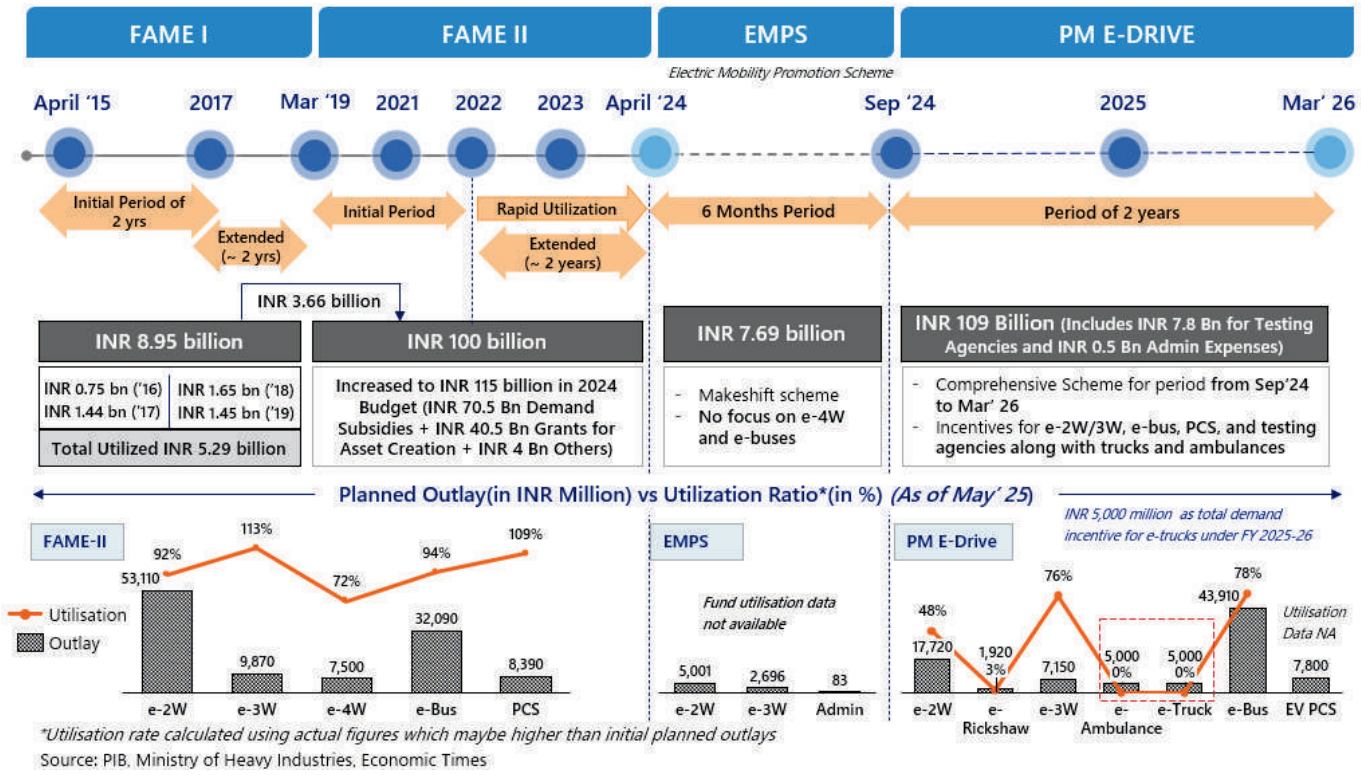
Manekdeep Singh Ratra
Co-founder,
Charge City

- *India's commercial EV market is poised for rapid growth over the next five years, driven by rising fuel costs, supportive policies, and corporate sustainability goals. Fleet operators are increasingly adopting EVs for better total cost of ownership. Key players—OEMs, chargers, battery makers, and financiers—will need to collaborate on bundled solutions with uptime guarantees and smart fleet management to scale adoption and build a dependable EV ecosystem.*

2. Regulatory Status and Challenges for Commercial EVs

Policy and Incentives- Central Government

Demand Side Incentives



As part of the National Electric Mobility Mission Plan (NEMMP) 2020, the Department of Heavy Industry (DHI) launched the FAME India Scheme in 2015 to promote electric and hybrid vehicle technology. Phase-I focused on creating demand through incentives, supporting around 2.78 lakh EVs. Phase-II, with a budget of INR 10,000 crore, targets 7,000 e-buses, 5 lakh e-3 wheelers, 55,000 e-4 wheelers, and 10 lakh e-2 wheelers. The budget was further increased to INR 11,500 Crore in February 2024 and supported over 16 lakh vehicles. Post the FAME II scheme, the Electric Mobility Promotion scheme was launched as a transition scheme. It was followed by a makeshift scheme, EMPS, which ran until September 2024. The PM e-drive, beginning in Oct '24 with an allocation of INR 115 billion, is a more comprehensive scheme for the CV environment, introducing subsidies for e-ambulances, testing agencies, and recently notifying total demand incentives for e-trucks worth INR 500 Crore in FY26.

e-3W has shown high utilization (113%: FAME-II and 76%: PM e-Drive) and exceeded the initial allocation in FAME-II. e-4W funds were underutilized (72%) and therefore dropped in PM e-drive. Bus has the highest allocation and utilization rate in PM e-Drive, reflecting a strong push for fleet electrification. While e-2W allocation was reduced, subsidies for e-3W/rickshaw were maintained along with the introduction of incentives for e-trucks, signalling a slow policy shift towards commercial vehicles (CV).

Supply Side Incentives

	1 Production-linked Incentive (PLI) Scheme for Automobile and Auto Components	2 Production-linked Incentive (PLI) Scheme for Advanced Chemistry Cell Battery storage	3 New EV policy allowing the import of CBU cars at reduced import duty
Policy Objective	**Boosting the manufacturing** of Advanced Automotive Technology (AAT)-FCEV, FFV and BEV	**Domestic manufacturing of batteries** in India by setting up Gigafactories	**Reducing entry barrier** for global EV makers for the Indian PV market
Budgetary Outlay	INR 254 B (5 years: FY23 to FY27)	INR 181.1 B (Gestation period: CY23 & CY24; Performance period: CY25-CY29)	Reduced import duty from 110% to 15% for CBU of cars >USD 35,000
Scheme Overview	- The PLI scheme is divided into two segments - Champion OEM incentive Scheme, Component champion incentive Scheme - Based on the revenue of group and investments, incentives will be disbursed in the subsequent financial years of manufacturing	- Three entities have been allotted the PLI for ACC Battery storage – Ola Electric Mobility, Reliance New Energy and Rajesh Exports - Expected value addition clause of min. 25% within 2 years from the appointed date & min. 60% within 5 years from the appointed date	- With a minimum investment limit of INR 41.5B (~USD 500 M), OEM gets reduced import duty on CBU for 5 years for 8,000 cars a year - In addition, a min. domestic value addition of 25% has to be achieved within 3 years & 50% within 5 years

Source: MHI website, heavyindustries.gov.in, [Accessed 2025/07], PIB

PLI scheme subsidizes local EV and component production, including ACCs with the aim of boosting manufacturing and supply chains. Recently, import duties on luxury EVs were also reduced to 15%, contingent on local investment.

Policy and Incentives- State Government

▶ Detailed Policy analysis done on top-10 states which cumulatively makes ~80% of all EV sales between FY20 to FY25

Top-10 States (by EV Sales)	Cumulative EV Sales (FY20-FY25) (in 000's)	EV as % of Total Vehicle Sales	Purchase subsidy					Retrofitting			Tax Exemption		Vehicle scrap incentive on EV purchase	Charging Infra Subsidy	Mfg. Capital Subsidy	Special EV Charging Tariffs
			2W	3W	4W	Bus	LCV	2W	3W	4W	Road Tax	Regn Fee				
① Uttar Pradesh	1,043	5.5%	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
② Maharashtra	686	4.9%	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
③ Karnataka	525	5.7%										✓		✓	✓	✓
④ Tamil Nadu	367	3.5%						✓	✓		✓	✓		✓	✓	✓
⑤ Rajasthan	340	4.2%	✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	✓
⑥ Bihar	329	4.6%	✓	✓	✓							✓		✓	✓	✓
⑦ Delhi	300	8.5%	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓
⑧ Gujarat	260	2.8%	✓	✓	✓						✓	✓		✓	✓	✓
⑨ Madhya Pradesh	252	3.0%						✓	✓	✓	✓	✓		✓	✓	✓
⑩ Kerala	234	5.1%		✓										✓	✓	✓

Source: Govt Policy Documents, VAHAN Dashboard, PIB, News Articles

The table above maps the policy of the Top 10 states, which cumulatively make up ~80% of all EV sales over the last 5 years. Supply-side subsidies were largely similar across states offering special EV tariffs, subsidies for Charging Infrastructure and Manufacturing Capital. On the demand side, Road tax and registration fees exemption were a common feature. 7 states offer Purchase subsidies, with 3 states offering retrofitting incentives (Rajasthan also offer that for buses). Only Uttar Pradesh & Maharashtra offer incentives for LCV (Goods Carrier). Tamil Nadu is in discussion to offer targeted incentives to Commercial Fleets.

Policy Challenges for Commercial EVs

Lack of Light Commercial Vehicles/Fleet Specific Incentives: Current EV incentives are often one-size-fits-all with no specific incentives for CV/ fleet operators in the 2W, 4W segments. It fails to address unique challenges in logistics and e-commerce, where fleet operators require different configurations and operational support. LCVs are often overlooked, with states focusing on e2W & e3W, with UP & Maharashtra being the only top states offering purchase subsidies for goods carriers. Fleet electrification is largely limited to the electrification of buses, with the central government only recently notifying a subsidy for e-trucks under the PM e-drive.

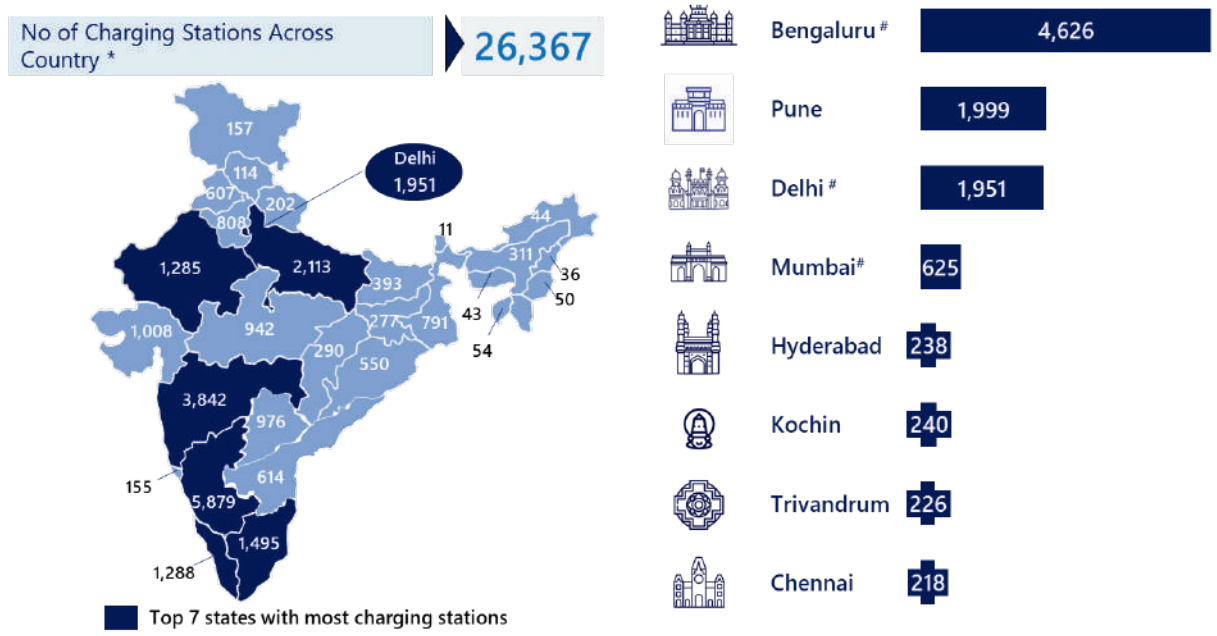
Policy Inconsistency & Delays: State-specific variations in policies and incentive structures create confusion for fleet operators as well as manufacturers. Some states like Karnataka and Kerala have rolled back the exemption on Road tax and registration fees. The approval processes for accessing incentives, vehicle registration, and charging infrastructure setup are slow and complex, leading to delays in fleet adoption and operational inefficiencies. There is also a lack of long-term policy on the national level, with the PM e-drive set to end in Mar'26.

Charging Infrastructure Gaps and lack of EV ecosystem: Lack of adequate fast-charging stations and battery swapping stations, particularly for long-haul vehicles or freight trucks that require quick turnaround times. The EV ecosystem for fleet electrification, including maintenance support, skilled workforce, and service centres, is underdeveloped, with concerns about the availability of spare parts, battery maintenance, and technician training.

3. Infrastructure Trends for Enabling Commercial Electrification

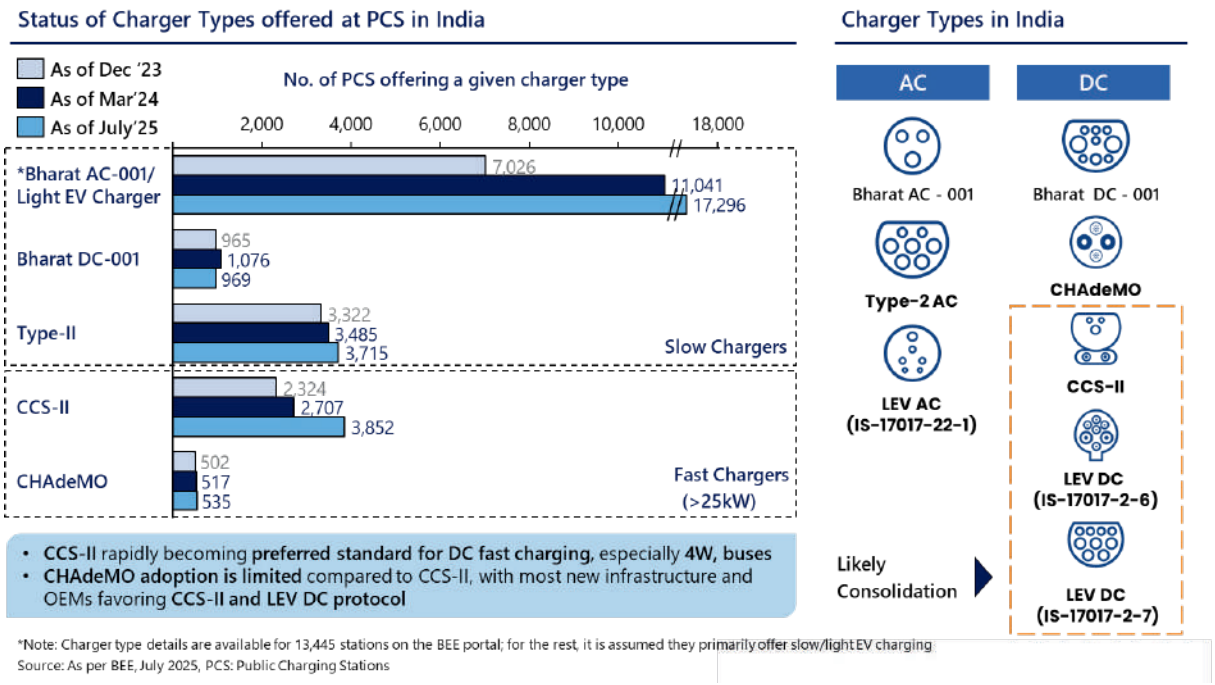
India's journey toward commercial vehicle (CV) electrification is gathering pace, supported by ambitious climate goals, strong regulatory frameworks, and innovations in battery and charging technologies. However, the scalability and long-term viability of this transition rest heavily on the country's infrastructure ecosystem. Charging availability, grid readiness, standardization of protocols, and public-private cooperation all form the bedrock of this ecosystem.

3.1 Current Status of Charging in India



Sources: PCS as per BEE, March 2025 ** (Accessed last on 4 Jul 2025) Map of India shown is only Indicative and may not accurately represent boundaries. UT PCS not indicated on map
Mumbai includes city, suburb & Thane, Bengaluru includes both urban& rural, Delhi limited to state boundary

While India's public EV charging footprint has expanded to 26,367 Public Charging Stations (PCS) as of March 2025, a granular analysis reveals significant limitations when applied to commercial vehicle use cases. The current ecosystem is largely optimized for private electric two-wheelers and passenger cars rather than the needs of high-utilization commercial fleets.



*Note: Charger type details are available for 13,445 stations on the BEE portal; for the rest, it is assumed they primarily offer slow/light EV charging
Source: As per BEE, July 2025, PCS: Public Charging Stations

Future developments are likely to benefit from the PM E-DRIVE scheme, which aims to enhance EV charging infrastructure across all major segments, including e2W, e3W, e4W (cars, ambulances, LGVs), e-Buses, and e-Trucks. It will support the deployment of 72,300 fast chargers nationwide:

- 48,400 chargers (12 kW, LECCS/LEVDC) for e2W/e3W in top 40 cities
- 22,100 chargers (≥60 kW, CCS-II) for e4W and LGVs—18,900 in cities and 3,200 on highways
- 1,800 high-power chargers (≥240 kW, CCS-II) for e-Buses and e-Trucks—1,600 on highways and 200 in cities

3.2 PM E-Drive's PMP for N2/N3 Electric Trucks

The **PM E-Drive Scheme**, notified on **10 July 2025**, introduces for the first time a **Phased Manufacturing Programme (PMP)** exclusively for **electric trucks in the N2 and N3 categories**. This PMP lays out **time-bound, component-specific mandates** that require key EV systems—such as **battery packs, Battery Management Systems (BMS), motor controllers, vehicle control units, and CCS2 charging inlets**—to be **domestically manufactured,** with clear criteria for what constitutes localization (e.g., PCB-level integration, connector fitment, firmware flashing). The policy is a **marked departure from earlier localization frameworks**, like the **50% minimum domestic content rule under FAME-II,** which often led to superficial compliance.

3.3 Charging Patterns: Segment-Specific Infrastructure Needs

Primary Segment		Charging Locations	CV Focus	Key Trends
2W (L1/L3)	Personal Use/ Delivery Fleets	- **Home charging (70%)** - Workplace complex (20%) - Public charging (10%)	△	- 90%+ charging still happens at home - Public fast charging growing in Tier-2/3 cities (60% of installations) - **Ather's interoperability initiative enabling cross-brand charging**
3W (L3/L5)	Passenger	- **Captive swap/hub charging (60%)** - Public charging (25%) - Home (15%)	○	- **Battery swapping** dominates (70%+ of new e-rickshaws) - Compact SwapX stations now at pharmacies/small businesses
	Goods (Cargo, Delivery)		○	- **Last-mile delivery driving 60% of 3W EV adoption** - Swapping preferred for high-utilization commercial use
4W (M1)	Personal	- **Home/residential(80%)** Office/Mall complex(10%) - Public charging(10%)	△	- **80%+ PV owners charge at home/workplace** - Public DC charging used mainly for range extension
	Commercial (Taxi/Cab)	- **Captive charging(60%)** - Public charging(40%)	○	- **BluSmart opened network to public & rival fleets in 2024** - BluSmart Drivers now use any public charger except select hubs
SCV/LCV (N1/N2)	Last-Mile Delivery/ Intra-City Logistics	- **Fleet depot charging(90%)** - Public DC chargers(10%)	● *100%*	- 2-3.5T category is fastest growing CV segment - **E-commerce/urbanization** driving 90% depot charging adoption - **90% overnight depot charging** for cost control - Public DC top-ups during peak delivery hours becoming standard
MHCV (N3)	Public Transport Buses/ Freight Trucks	- **Dedicated depots(90%)** - High-power charging stations at **highways(10%)**	● *100%*	- **100% depot/hub charging** with 24x7 managed operations - **JBM EcoLife:** DC charging hubs for e-buses (400km range, ultra-fast charging); operates Ahmedabad BRTS fleet - **Charge Zone supercharger**: 15-20 min charging, 45 min at regular DC - Heavy CVs exclusively use depot-style charging infrastructure - **Highway charging** network expanding for long-haul e-trucks

Impact: ● CV Focused Charging Infra ○ Rely on hub charge, but not yet large scale infra △ Low CV Focus

Source: NRI Analysis

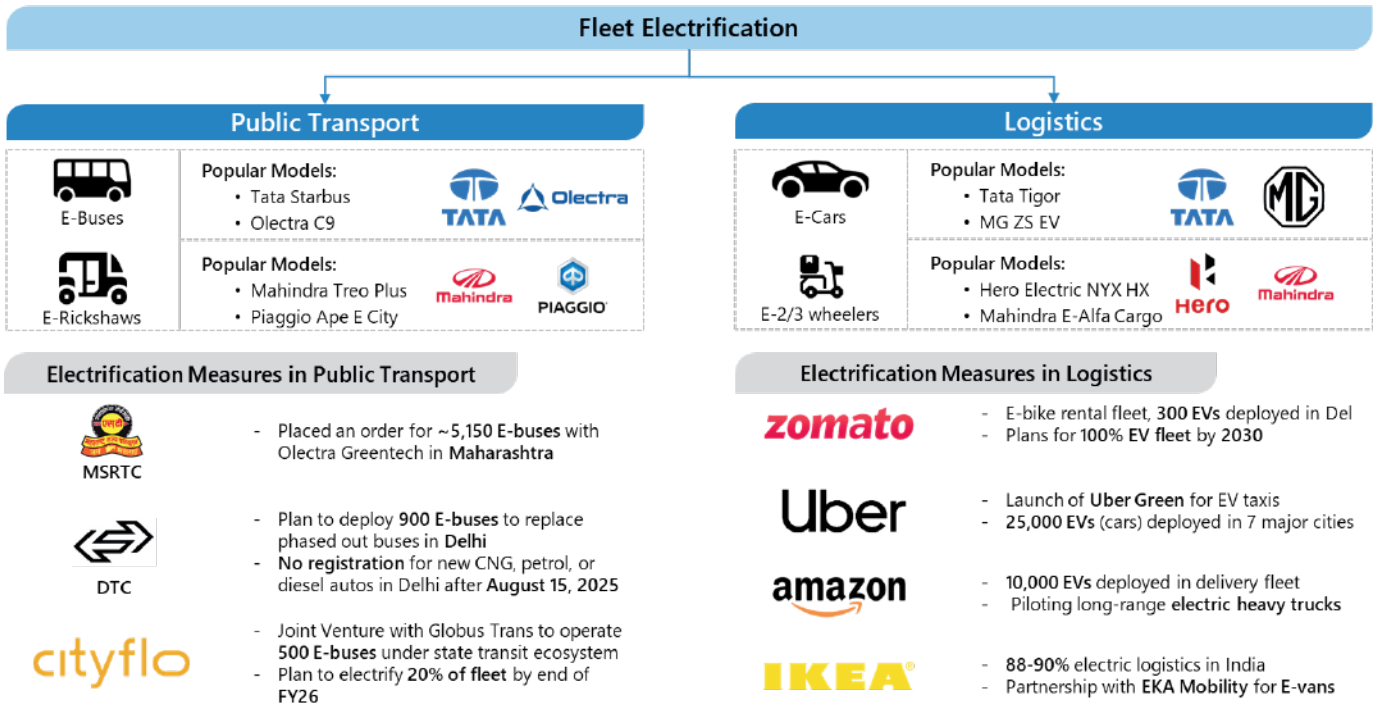
Charging behaviors differ widely across vehicle segments, requiring tailored infrastructure planning. While 2Ws and personal 4Ws still predominantly rely on home and workplace charging, commercial fleets demand higher power, reliability, and route integration:

- 2W & 3W: Over 90% of charging happens at home or swap kiosks. Battery swapping dominates for 3Ws due to quicker turnaround needs, with increasing deployment near Kirana shops and urban hubs.
- SCV/LCV: The most rapidly electrifying CV segment, driven by e-commerce. Fleet depot charging (often overnight) is the mainstay, but peak-hour public DC top-ups are becoming common.
- M&HCV: This segment necessitates heavy-duty infrastructure, dedicated depots, megawatt charging, and highway corridor hubs. Operators are piloting ultra-fast charging (15–30 min cycles) and V2G-compatible solutions.

EV infrastructure planning must move beyond metro-centric public chargers to focus on high-utilization routes, depot electrification, and mid-shift top-up needs in logistics parks and industrial corridors.

Understanding these patterns is critical for infrastructure planning and investment prioritization.

3.4 Fleet Electrification in Public Transport and Logistics



Source: NRI Analysis, News Articles

A growing number of public and private entities have begun implementing structured fleet electrification strategies.

Public Transport Initiatives

- **MSRTC**: Has placed an order for 5,150 e-buses from Olectra Greentech in Maharashtra.
- **DTC**: Plans to induct 900 e-buses and has banned new ICE auto registrations from August 2025.
- **Globus Trans (JV with State Transport)**: Will operate 500 e-buses, focusing on semi-urban and urban routes.

These transitions are being facilitated via state subsidies, FAME-II support, and growing public-private collaborations for depot electrification.

Logistics and Urban Delivery

- **Uber Green**: Operational in 7 major cities with 25,000 EVs.
- **Zomato, Flipkart**: Have collectively deployed 10,000+ delivery EVs.
- **Amazon**: Piloting long-haul electric truck deployment.
- **EKA Mobility:** Involved in partnerships, particularly in deploying electric vans for logistics use.

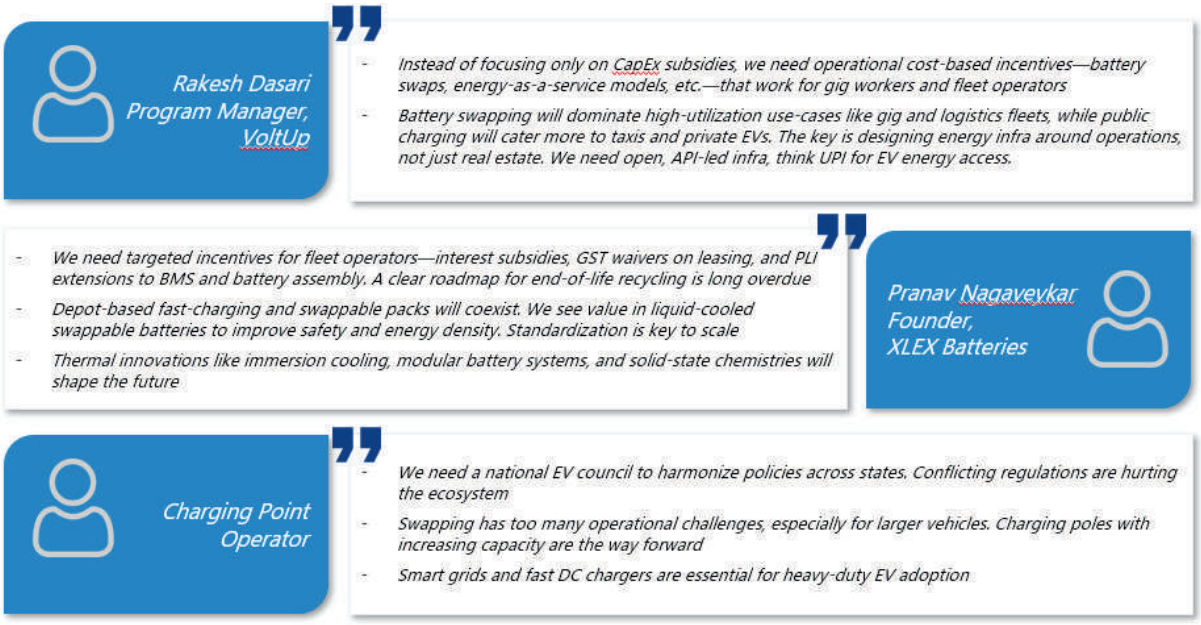
These players increasingly rely on embedded infrastructure (charging/swapping integrated within operational routes) to minimize downtime and optimize delivery schedules.

Way forward: Stakeholder Perspectives

Drawing from extensive stakeholder interactions, including OEMs, CPOs, government think tanks, fleet operators, and EV startups, a nuanced and pragmatic roadmap emerges:

1. Incentive Structures Focused on Utilization

- Move beyond CapEx-heavy subsidies to models rewarding vehicle usage (e.g., per km, per swap)
- Incentivize battery leasing, energy-as-a-service, and performance-linked fleet subsidies
- GST waivers for leasing, EV rentals, and BaaS subscriptions



2. Grid and Infrastructure Readiness

- Upgrade transformers and feeders in depot-heavy districts
- Enable time-of-day and peak shaving tariffs
- Embed charging infrastructure into city planning (e.g., logistics parks, fuel stations, metro depots.

3. Standardization, Safety, and Innovation

- Create a national standard for commercial EV battery form factors
- Promote thermal safety through liquid-cooled swappable batteries
- Support R&D in solid-state, sodium-ion, and immersion cooling technologies

4. Policy Coherence and Governance

- Establish a national EV infrastructure council to harmonize policies across states
- Accelerate FAME-II disbursals and expand PMP coverage to battery assembly and BMS
- Support local manufacturing and retrofit incentives for legacy fleets

5. Financing and Public-Private Models

- Encourage land-lease partnerships for charging hubs
- Deploy VGF for fast-charging infrastructure in low-demand areas
- Mandate chargers every 25 km on national highways

4. Game-Changing Business Models Fuelling Fleet Electrification

Electrification is reshaping the business calculus of Indian commercial transport. Capital, risk, revenue and even data flows are being redistributed across financiers, energy providers and digital platforms - not just OEMs and fleet operators. This chapter unpacks four business-model levers pushing India toward electric mobility.

4.1 Comparative Analysis of Fleet Ownership vs Leasing vs Subscription Models

For decades, transporters followed a simple formula: buy the truck, run it hard for a decade, then sell it for roughly a quarter of its original price. Diesel tech evolved slowly, regulations were predictable and secondary-market prices were easy to model. High-voltage battery packs have broken that certainty. They front-load up to half of the vehicle's value into a component whose second-hand price is still uncharted. Meanwhile tightening emission norms are shortening the useful life of traditional powertrains.

		① OWNED	② LEASED		③ SUBSCRIBED
			WET LEASE	DRY LEASE	
ⓐ OPERATIONS	*Ownership*	Fleet Operator	Lessor		Platform Owner
	Maintenance	In-house / OEM AMC	Bundled with lease	In-house / OEM AMC	Bundled in fee
	Ownership Period	10-12 years	5-7 years	4-6 years	2-3 years
ⓑ USE CASES		Core routes (long distances)	Seasonal peaks	Rapid scale-up with own drivers	Last-mile
ⓒ SUITABILITY FOR EVs		*MODERATE* (suitable for long-term)	*HIGH*	*HIGH*	*LOW*
ⓓ FLEET OPERATOR MINDSET		Preferred due to traditional mindset	Limited acceptance due to low range of options, low awareness		No major options yet
ⓔ ADVANTAGES		- Full control - Lowest lifetime TCO - Asset depreciation	- No operational hassle - Cost certainty	- Off-balance sheet Capex	- Zero Capex - Fast scaling
ⓕ DISADVANTAGES		- High upfront Capex - Residual value risk	- Limited autonomy	- Maintenance risk	- Highest cost per km - Tied to provider network

NOTE: Further analysis conducted on Owned, Dry Lease and Subscribed.
Source: NRI Analysis

As a result, new business models are emerging to support the arrival of EVs. Leasing eliminates the down payment and shifts residual-value risk to a specialist asset manager. Kilometre-linked subscription (or Fleet-as-a-Service (FaaS)) goes further by folding the vehicle, energy, maintenance, tyres and telematics into a single rupee-per-kilometre fee. Early last-mile pilots show uptime gains of 8–10 % because responsibility is centralised. Ownership is far from obsolete, though. It delivers the best economics for operators who can hold the truck beyond the eight-year battery warranty and keep utilisation high on captive long-haul routes like cement, petroleum or FMCG.

Three key parameters usually decide the path: contract duration, balance sheet and operational volatility. Short contracts tilt toward leasing; listed 3PLs favour subscription to keep liabilities off the books; seasonal or geographically fluid networks opt for pay-as-you-go flexibility.

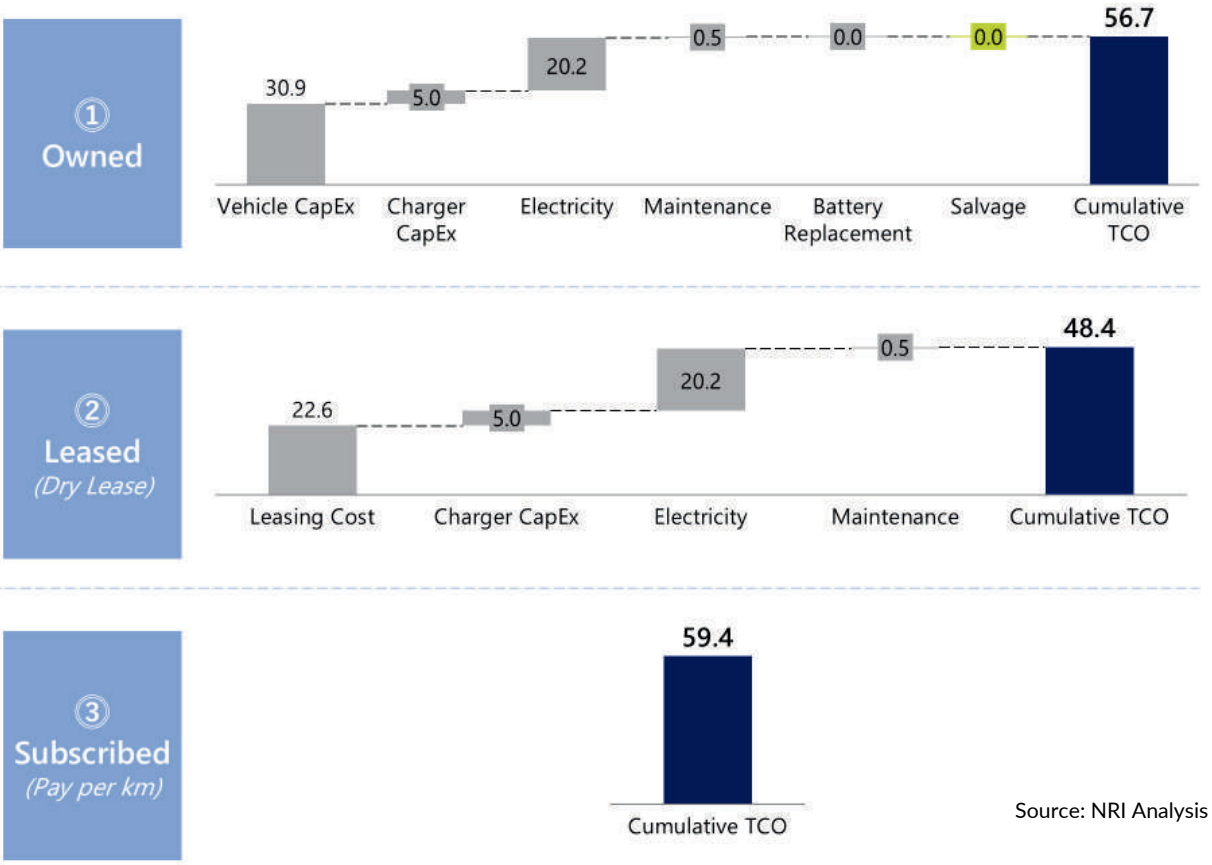
4.2 Financing Options & Total Cost of Ownership (TCO) Analysis

Electrification trends in India differ vastly across personal and commercial usages. Purchases for personal purposes are driven by sentiment, while commercial purchases are driven by economics. Total-Cost-of-Ownership (TCO) is the fleet manager's compass. By aggregating every rupee spent across the vehicle's life - capital cost, finance charges, energy, maintenance, downtime and salvage, it neutralises the misleading gap in sticker prices between diesel and electric.

We've conducted a TCO-analysis across the 3 business models discussed in Section 4.1. This compares the cumulative cost of Ownership vs Leasing vs Subscription at multiple time-points in the operational lifetime of an EV. Below are the assumptions for the baseline TCO model:

- Vehicle: (MHCV EV)
  - GVW = ~14-15 Tonnes
  - Battery Capacity = ~200 kWh
  - Maintenance Cost = ₹ 0.6/km (from 3rd year)
- Ex-Factory Vehicle Cost = ₹ 25.15 lakh
- Charger Cost (for commercial purposes) = ₹ 5 lakh (60 kW CCS2 fast charger)
- Utilisation:
  - Distance Covered = 90,000 km per year (246 km/day, 365 days)
  - Battery Efficiency in 1st year = 0.88 kWh/km
  - Battery Efficiency declines by 0.044 km/kWh until battery replacement
- Electricity tariff: ₹ 6.22/kWh (electricity prices for commercial charging in Haryana)
- Financing:
  - Ownership: 10% down payment, 5-year loan at 15% annual interest
  - Lease: Monthly cost of 2.5% of Ex-Factory Vehicle Cost
  - Subscription: ₹ 22/km covering vehicle, charger, service and insurance
- Battery Replacement
  - Required in the 5th and 10th years of ownership
  - Battery Cost in 2029 = ₹ 5,100/kWh (at constant USD-INR prices of 2025)
  - Battery Cost in 2034 = ₹ 4,250/kWh (at constant USD-INR prices of 2025)
- Salvage:
  - Battery = 25% of battery cost in the year of salvaging (repurposed for ESS)
  - Vehicle = 10% of the original purchase cost

A) Total Cost of Ownership at 3 years (all values in INR Lakh)



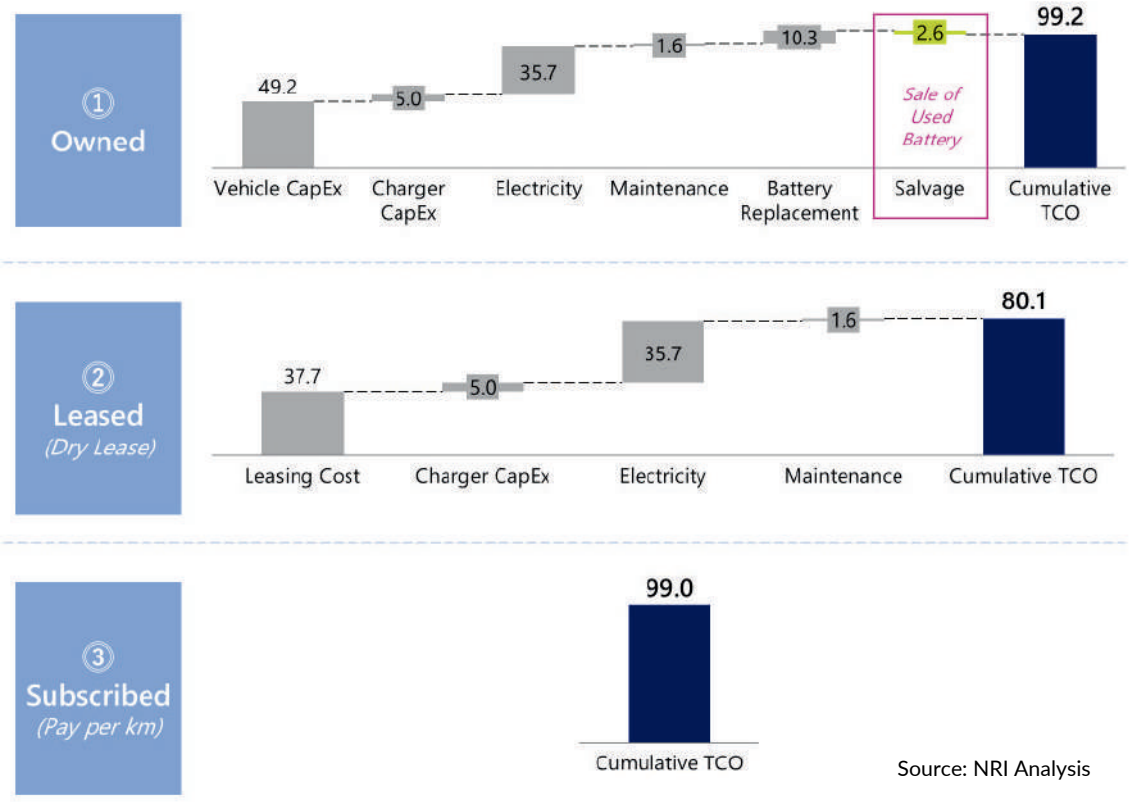
Source: NRI Analysis

At the 3-year mark, leasing proves to be most economical followed by ownership with subscription trailing. Under ownership, the interest charges for vehicle purchase is the major contributing factor for leasing to be more economical. Maintenance is minimal in the first 3 years since the vehicle is largely covered under OEM warranty which provides free servicing for the first 2 years.

On a cost-per-km basis, leasing proves to be ₹ 17.92/km, followed by ownership at ₹ 21/km and subscription at a fixed ₹ 22/km. The cost-per-km for ownership decreases rapidly from Year-1 to Year-3 due to 2 key parameters:

- High battery efficiency, requiring low electricity costs
- Vehicle under warranty, requiring low maintenance costs

B) Total Cost of Ownership at 5 years (all values in INR Lakh)



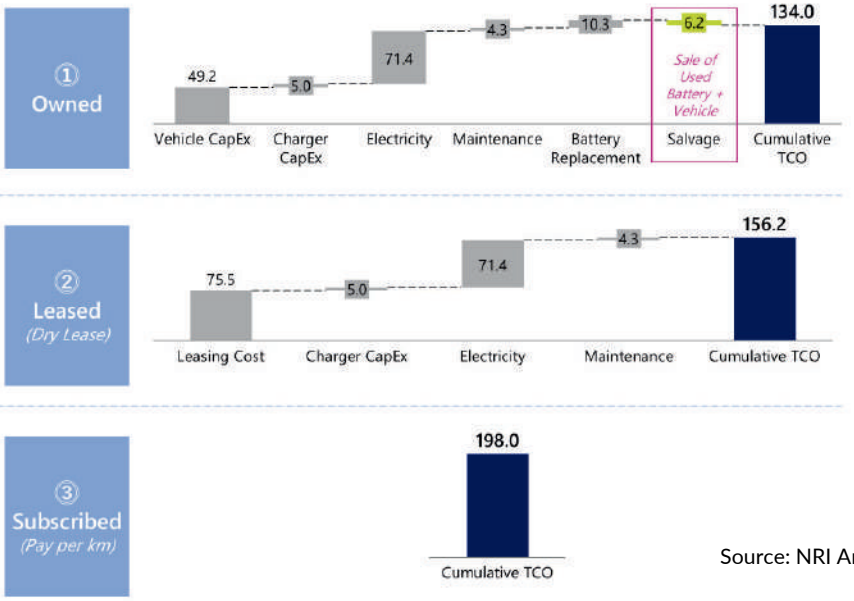
Source: NRI Analysis

At the completion of 5 years, leasing continues to be the most economical by a significant margin. Ownership overshoots subscription during the 5th year due to a high battery replacement cost. Ownership also observes a higher vehicle capital expenditure since the loan continues into the 5th year. Subscription proves to be a viable option until the 5th year for fleet operators seeking to avoid operational activities and associated risks.

On a cost-per-km basis, leasing proves to be ₹ 17.79/km, followed by subscription at a fixed ₹ 22/km and ownership at ₹ 22.04/km. The cost-per-km for leasing & ownership increases from Year-3 to Year-5 owing to:

- Declining battery efficiency, consuming higher electricity
- Requirement for maintenance post-warranty duration

C) Total Cost of Ownership at 10 years (all values in INR Lakh)



Source: NRI Analysis

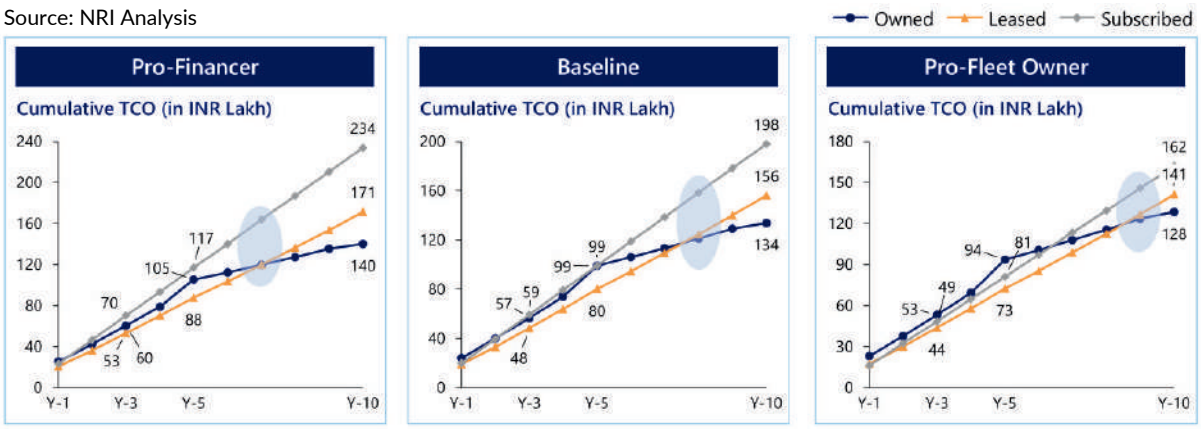
It has been assumed that the vehicle's life is 10 years. For an end-of-life vehicle, ownership becomes notably less expensive than leasing or subscription. Despite a battery replacement cost in Year 5, ownership breaks even in Year 8 owing to no vehicle capital expenditure beyond Year 5. Ownership also benefits from salvage value (for the vehicle body and 2 batteries owned during the lifetime). Subscription becomes unviable for long-term defined usage.

Leasing can be a potential substitute for ownership (costing an additional ₹ 22 Lakhs), depending on the fleet owner's desire for autonomy and risk-taking ability. Ownership lags leasing by nearly ₹ 20 Lakhs at mid-life of the vehicle, indicating that leasing is best suited for short and mid-term usage.

On a cost-per-km basis, ownership stands at ₹ 14.89/km, followed by leasing at ₹ 17.36/km and subscription at a fixed price of ₹ 22/km.

D) Total Cost of Ownership Sensitivity on Financing Scenarios (all values in INR Lakh)

Source: NRI Analysis



	Pro-Financer	Baseline	Pro-Fleet Owner
Interest Rate on Loan	18%	15%	12%
Leasing Monthly Cost	3.0% of Vehicle CapEx	2.5% of Vehicle CapEx	2.0% of Vehicle CapEx
Subscription Cost	INR 26 / km	INR 22 / km	INR 18 / km

- Year in which Ownership becomes more economical than Leasing
  - Pro-Financer = Year-7
  - Baseline = Year 8
  - Pro-User = Year-9
- In the short & mid-term (3 years and 5 years), Leasing is always more economical than Ownership

We have proposed 3 scenarios based on the financer's acceptance of EV MHCVs, leading to either reduced interest rates or increased interest rates, along with the proposed baseline scenario of current rates. In all 3 scenarios, leasing continues to be the preferred option in the short and mid-term, continuously maintaining a difference of ₹ ~20 Lakhs with ownership.

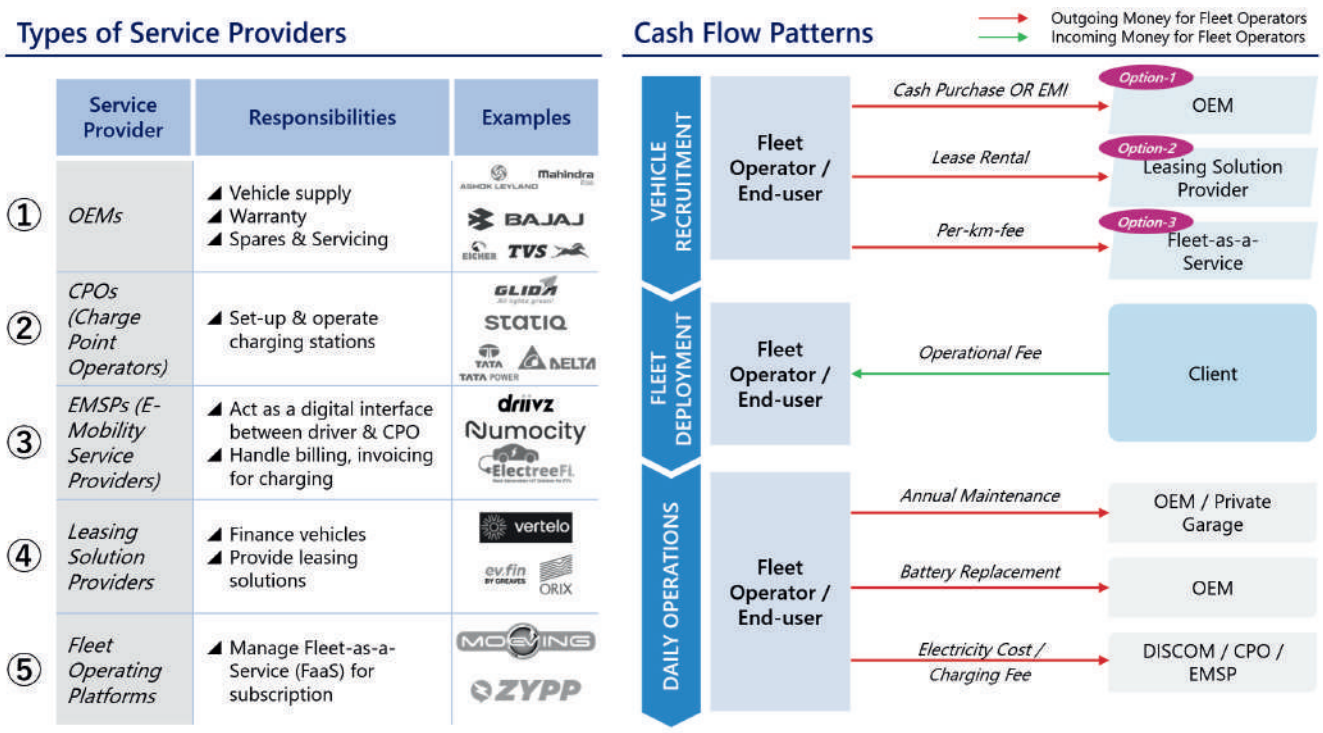
Pro-Financer Scenario: This assumes a hike in interest rates due to declining confidence of bankers in the residual value of EV MHCVs. As a result of hiked interest rates, the lifetime cost of ownership increases by a marginal ₹ 6 Lakhs. However, ownership breaks even with leasing earlier than the baseline scenario in Year 7. Since lessors pass on the cost of interest to the fleet operator, leasing becomes a less suitable option post-Year 7. At the end-of-life, ownership is nearly ₹ 30 Lakhs cheaper than leasing. Throughout the duration of vehicle usage, subscription remains the most expensive business model.

Pro-Fleet Owner Scenario: This scenario assumes an optimistic decline in interest rates owing to either government push or fleet owners demonstrating residual value at the vehicle's end-of-life. The lifetime cost of ownership is less than leasing at ₹ 13 Lakhs. Ownership breaks even only in the 9th year. This indicates that leasing can become a sustainable solution for the entirety of the vehicle lifetime.

4.3 Revenue Models for Fleet Operators & Service Providers

Beyond freight rates, electrification opens monetisation through energy sales, data analytics, and carbon credits. Six stakeholder groups tap these streams: OEMs, leasing firms, Fleet-as-a-Service orchestrators, fleet operators, charge-point operators (CPOs) and end-customers.

OEMs now pursue annuity income via over-the-air updates and predictive-maintenance subscriptions. Leasing companies earn a spread on capital plus upside on residual value if they can redeploy assets into secondary markets. FaaS providers layer software dashboards, charger access and 24×7 uptime guarantees on top of leases, targeting gross margins of 18-20 %. CPOs bundle renewable power purchase agreements with charging services, allowing shippers to claim near-zero Scope-3 emissions.



Source: NRI Analysis

End-customers are increasingly willing to pay a premium for verified green kilometres, especially e-commerce players who advertise carbon-neutral deliveries. That premium cascades back through the chain as a new potential revenue line: carbon credits.

4.4 Risk Management & Scalability Factors

A) Risks Posed

In an electric fleet, risk does not vanish - it migrates. Ownership concentrates financial exposure and utilisation risk on the fleet operator. Leasing defuses much of that onto a financier's balance sheet but introduces covenant risk: drop below utilisation thresholds and penalty charges kick in.

Subscription shifts almost every asset risk to the provider, who in turn must manage pooling efficiency and residual-value uncertainty.

Technical risk, often cited as battery degradation, has proved manageable: a teardown of 120 leased e-trucks showed a median state-of-health of 88 % after 36 months, better than many operators feared. Operational risk looms larger—especially charger downtime and queuing, which can sink driver productivity if not mitigated by redundancy planning.

Subscription minimises nearly all potential operational and financial risks to a fleet operator. Leasing proposes a middle ground by mitigating key financial risks of high capital expenditure and depreciation.

Risk→ ⊙ High ○ Medium △ Low	Risk Element	Business Model			Mitigation Strategy
		Owned	Leased	Subscribed	
Operational Risks	Operational Downtime	⊙	○	△	Investment into a robust AMC
	Maintenance Risk	⊙	⊙	△	1. Regularly track & schedule maintenance 2. Use of AI for reminders
	Fleet Utilisation	○ *Risk of under-utilisation*	○	△ *Unutilised vehicles can be unsubscribed*	1. Robust business planning to mitigate unutilised capital 2. Choose leasing or subscription for additional vehicle requirement
	Energy Availability	○ *Self-setup of charging infra*		△	
Financial Risks	Upfront CapEx	⊙	△	△	1. Alternate financing options such as leasing, subscription reduce cost burden
	Depreciation	⊙	△	△	Regular asset valuation & exploring sell-back options for ownership
	Cost Predictability	⊙	○	△ *High predictability, low ability to optimise costs*	1. Maintain contingency funds for ownership

Source: NRI Analysis

B) Scalability Factors

Scale follows capital strategy. Scale can be achieved in 2 ways:

1. Operational expansion in the same geography
2. Geographical expansion to newer states/cities

	Scalability Factors	Business Model: Owned	Business Model: Leased	Business Model: Subscribed	Implications for Scalability
①	Flexibility to Scale Up/Down	△	○	◉	Subscription is most scalable during high volume seasons
②	Geographical Expansion	○ *Requires investment*	○ *Offers higher scalability due to lower CapEx. Limited by availability of lessors or FaaS models in concerned geographies*		Choice of ideal business model depends on geography chosen for expansion
③	Operational Complexity	△	○	◉	Subscription offers least operational complexity as the FaaS manages all requirements
④	Total Cost of Ownership over Lifetime	◉ *INR 134 Lakh*	○ *INR 156 Lakh*	△ *INR 198 Lakh*	Subscription offers highest flexibility along with lowest risk yet is nearly 50% more expensive than ownership

Scalability→ ◉ High ○ Medium △ Low

Source: NRI Analysis

Like potential risks, subscription offers the most scalable model since no capital expenditure is required. Leasing follows by offering the capability to ramp up rapidly while also balancing moderate operational complexity. Ownership is a proven model in case fleet operators are confident of revenue streams and their constancy. Any variations in demand or supply chain fluctuations are suited to subscription models as these are highly flexible. Leasing is slightly restricted by pre-defined contracts, which can render mid-contract termination expensive. However, scalability under asset-light models comes at the price of a distinctly higher TCO. TCOs can run from 25% (leasing) to 50% (subscription) higher than ownership, while considering the lifetime of a vehicle.

Regulatory volatility is the final variable. State subsidies, green-plate mandates, and potential zero-emission freight corridors can shift demand overnight. Smart contracts now include indexed clauses that automatically adjust pricing if FAME-III incentives change or if grid tariffs deviate beyond a band.

5. Strategic Use-Case Opportunities

India is undergoing a rapid transformation in urban mobility, driven by digital penetration, rising environmental awareness and proactive government policies. The electrification of commercial and shared mobility, particularly within gig work and ride-hailing sectors, is seen as a critical lever for decarbonization.

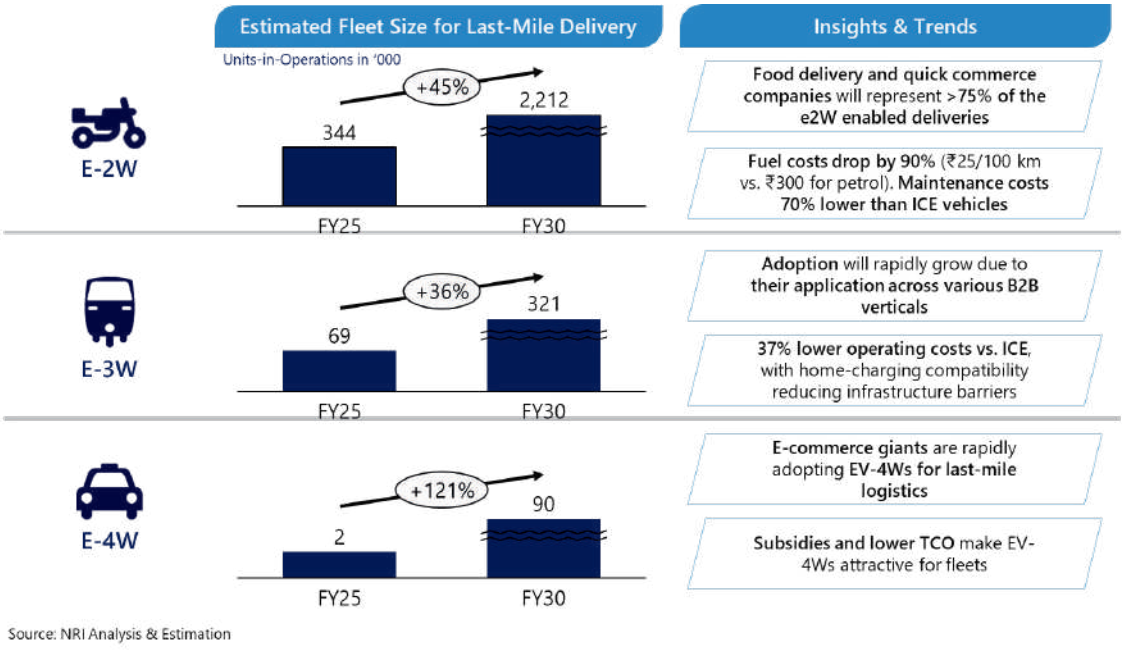
This section of the report focuses on two strategic applications: (1) Integration of electric vehicles (EVs) in quick commerce and gig delivery ecosystems, and (2) adoption and evolution of ride-hailing models in the context of EV integration.

5.1 Turbocharging Quick Commerce & Gig Work with EVs

India's Last Mile Logistics (LML) market is experiencing rapid growth, with e-commerce, courier express parcel (CEP) & food delivery sectors at the forefront. By FY25, the total market value is expected to reach USD 100+ billion, dominated by players such as Amazon, Zomato, and others:

A) EV Adoption in Last-Mile Logistics:

The transition to electric vehicles (EVs) in India's last-mile delivery market is gaining significant traction, with electric two-wheelers (E-2Ws) and three-wheelers (E-3Ws) leading the charge. The electrification of these vehicles is expected to rapidly transform delivery models, with electric four-wheelers (E-4Ws) increasingly playing a role in large-scale urban logistics.



E-2Ws (Electric Two-Wheelers):

Fleet Size Projections: By FY25, the E-2W fleet will total 344,100 units, growing to 2.2 million units by FY30, reflecting a 45% growth over the next five years. E-2Ws are the backbone of urban quick commerce and food delivery, representing over 75% of electric two-wheeler deliveries.

Key Insights: E-2Ws are transforming urban quick commerce and food delivery by drastically cutting fuel costs (90% lower than ICE vehicles) and maintenance costs (70% lower than ICE). Their widespread adoption in these sectors showcases the value of reduced operational costs and increased efficiency.

E-3Ws (Electric Three-Wheelers):

Fleet Size Projections: The fleet size of E-3Ws is projected to grow from 68,700 units in FY25 to 321,200 units by FY30, reflecting a 36% growth. E-3Ws will play a pivotal role in last-mile freight, especially in B2B logistics across urban areas.

Key Insights: E-3Ws offer 37% lower operating costs than ICE vehicles, making them an attractive option for B2B logistics. The vehicles' ability to be home-charged reduces the need for extensive charging infrastructure, further accelerating their adoption.

E-4Ws (Electric Four-Wheelers):

Fleet Size Projections: E-4Ws, although starting with a modest 1,700 units in FY25, are expected to grow significantly by 121%, reaching 90,200 units by FY30. This growth is primarily driven by e-commerce giants adopting electric four-wheelers for urban logistics.

Key Insights: E-4Ws are being adopted for last-mile logistics operations, especially by large-scale e-commerce companies. Subsidies and a lower total cost of ownership (TCO) make E-4Ws attractive for fleet owners, supporting their widespread use in urban logistics while contributing to sustainability goals.

B) Player Landscape and Ambitious EV Targets:

		Flipkart	amazon	Myntra	NYKAA	TATA 1mg
E-Commerce	Vehicles Used	2W, E-Bikes, E-3W, 4W	2W, 3W, E-3W, 4W	2W, E-Bikes, E-3W, 4W	Outsourced	2W, E-Bikes
	EV Focus	HIGH	HIGH	HIGH	MODERATE	HIGH
	EV Conversion Plans/Targets	100% EV Fleet (2030)	10,000 EV Fleet (2025)	100% EV Fleet (2030)	*Information Not Available*	*Information Not Available*
		zomato	**blinkit**	**SWIGGY**	**SWIGGY instamart**	**bigbasket**
Food Delivery	Vehicles Used	2W, E-Bikes, Bicycles	2W, E-Bikes	2W, E-Bikes, E-cycles		2W, E-3W, E-Vans, E-bikes
	EV Focus	HIGH	HIGH	HIGH	HIGH	HIGH
	EV Conversion Plans/Targets	100% EV Fleet (2030)	100% EV Fleet (2030)	800,000 km daily on EV (2025)		90% EV Fleet (2024)
		DELHIVERY	**shadowfax**	**GATI**	**Ecom Express**	**BLUE DART**
Courier & Parcel	Vehicles Used	Trucks, Vans, 3W	3W & 4W	3W, E-3W, 4W & Trucks	3W & 4W	3W & 4W
	EV Focus	HIGH	HIGH	HIGH	MODERATE	MODERATE
	EV Conversion Plans/Targets	*Information Not Available*	75% EV Fleet (2024)	100% EV Fleet (2025)	50% EV Fleet (2025)	*Information Not Available*

Source: NRI Analysis, Company Reports, News Articles

Major e-commerce companies like Flipkart, Amazon and Myntra are focusing heavily on electrifying their fleets, with targets such as 100% EV fleets by 2030. Tata 1mg and Nykaa, however, are slightly less transparent about their exact EV plans, with Tata 1mg indicating a strong focus on 2W and E-bikes, but with unspecified future goals. In the food delivery sector, companies like Zomato, Blinkit, Swiggy, and BigBasket also emphasize a transition to EVs, with Zomato and Blinkit aiming for 100% EV fleets by 2030.

The courier and parcel sector is similarly making strides, with companies such as Delhivery, Shadowfax and Gati planning significant EV adoption by 2024 and 2025. Other companies like Ecom Express and Blue Dart have more moderate targets, with Blue Dart focusing on EVs for trucks and vans, and Ecom Express targeting a 50% EV fleet by 2025.

Integrating Electric Vehicles (EVs) in last-mile delivery offers benefits like cost reduction, environmental improvements, and increased operational efficiency. However, challenges such as infrastructure gaps and range limitations need to be addressed. Technologies like AI-powered analytics and route optimization can help overcome these challenges and support a smooth transition to EV adoption.

C) Key Benefits of Integrating EVs in Last-Mile Delivery:

1. Cost Reduction: EVs offer up to 80% savings on fuel costs when compared to Internal Combustion Engine (ICE) vehicles. Maintenance costs for EVs can be up to 70% lower than their ICE counterparts.

2. Environmental Impact: EVs contribute to zero tailpipe emissions, which significantly reduces particulate matter (PM) and nitrogen oxide (NOx) pollutants. The integration of EVs leads to a 90% reduction in GHG emissions compared to ICE vehicles.

3. Tax Benefits: Government incentives, such as the FAME-II subsidies and reduced registration fees, lower transition costs for businesses adopting EVs.

4. Brand Value: Around 66% of consumers prefer brands that are eco-conscious, which enhances Corporate Social Responsibility (CSR) efforts and attracts sustainability-focused customers.

5. Operational Efficiency: Shorter and fixed routes reduce range anxiety and eliminate the need for fuel stops, boosting productivity by over 23%.

D) Key Challenges and Technological Solutions:

1. Lack of Charging Infrastructure: Technology Solution: Real-time charging station mapping integrated into route planning systems to help identify available charging points along delivery routes. Live updates on compatible charging points to ensure the vehicle is never too far from a charging station.

2. Range Limitations: AI-powered routing optimizes delivery paths based on battery capacity and payload. Systems automatically adjust routes to prevent battery depletion.

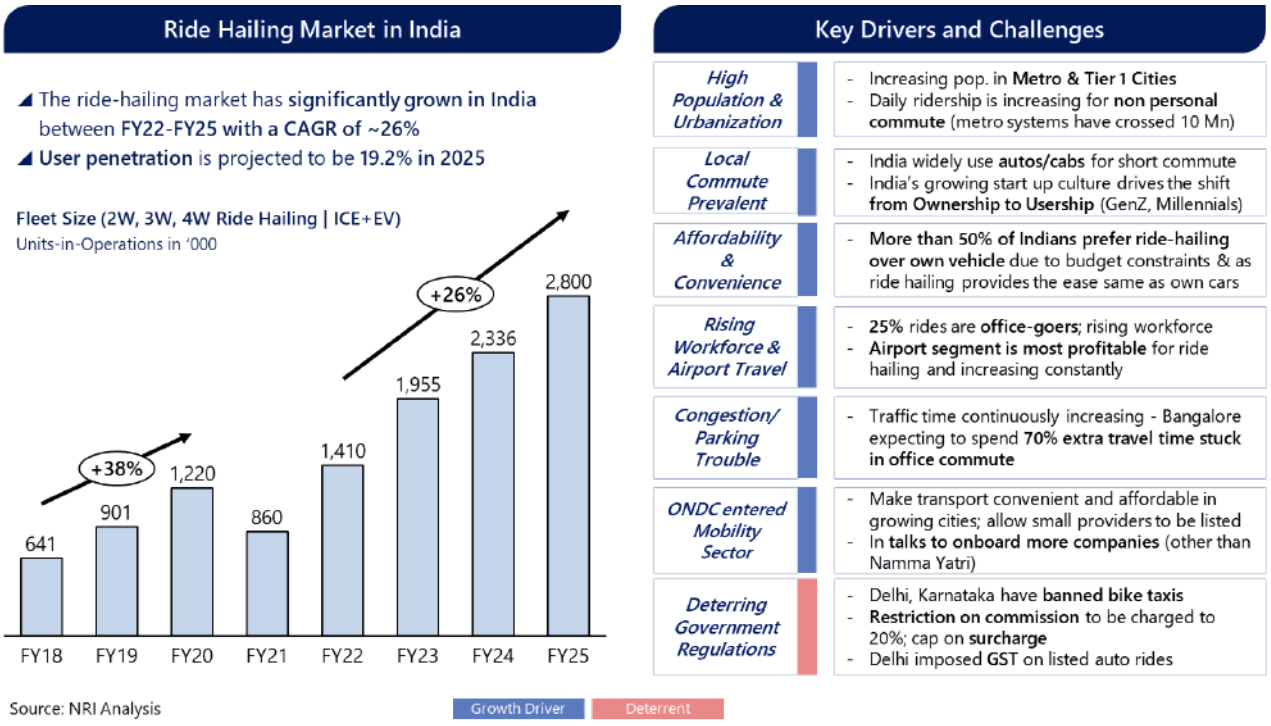
3. Long Charging Times: Strategic scheduling algorithms utilize delivery downtime (e.g., lunch breaks or shift changes) for opportunistic charging, reducing the impact of long charging times.

4. Fleet Management Complexity: Technology Solution: Centralized dashboards provide real-time battery status, vehicle health monitoring, and predictive maintenance alerts across the entire EV fleet.

5. Safety/ Reliability Concerns: Technology Solution: Battery performance analytics with anomaly detection to flag potential failures before they occur, ensuring vehicle safety and reliability.

5.2 Winning Models for the Future of Ride-Hailing:

The Indian ride-hailing market, currently at approximately 2.8 million total fleet size, is experiencing rapid growth. This expansion is driven by several key factors, including urbanization, affordability, and ride-hailing's ability to address congestion and parking challenges. The fleet size has witnessed a compound annual growth rate (CAGR) of around 26% from FY22 to FY25, with user penetration expected to reach 19.2% by the end of 2025. The growth trajectory has been marked by a significant recovery following a decline in FY21, as indicated by the market growth in FY22.



A) Key Drivers:

1. High Population & Urbanization: The rise in population, especially in metro and tier-1 cities, is driving demand for ride-hailing services. Daily ridership is increasing as more people opt for ride-hailing for non-personal commuting. Metro systems in major cities like Delhi, Mumbai, and Bengaluru have crossed 10 million ridership, contributing to the trend.

2. Local Commute Prevalence: In India, auto rickshaws and cabs are frequently used for short-distance travel, with the growing start-up culture further driving the shift from vehicle ownership to shared usage, particularly among younger generations (Gen Z and Millennials).

3. Affordability & Convenience: More than 50% of Indians prefer ride-hailing services over personal vehicle ownership due to budget constraints. Ride-hailing provides similar convenience to owning a car but at a lower cost, especially in major cities where vehicle ownership can be expensive.

4. Rising Workforce & Airport Travel: The growing workforce is contributing to the increase in ride-hailing demand, with 25% of rides taken by officegoers. The airport segment has also emerged as a highly profitable area, as airport-related rides are increasing significantly.

5. Congestion & Parking Troubles: Traffic congestion is worsening in major cities, such as Bengaluru, which is expected to see a 70% increase in travel time due to office commute traffic. Ride-hailing services offer a solution by alleviating the challenges of parking and reducing the burden on commuters.

6. ONDC's Entry into the Mobility Sector: The entry of the Open Network for Digital Commerce (ONDC) into the mobility sector is expected to further grow the market. ONDC aims to make transportation more convenient and affordable by enabling small providers to join the platform.

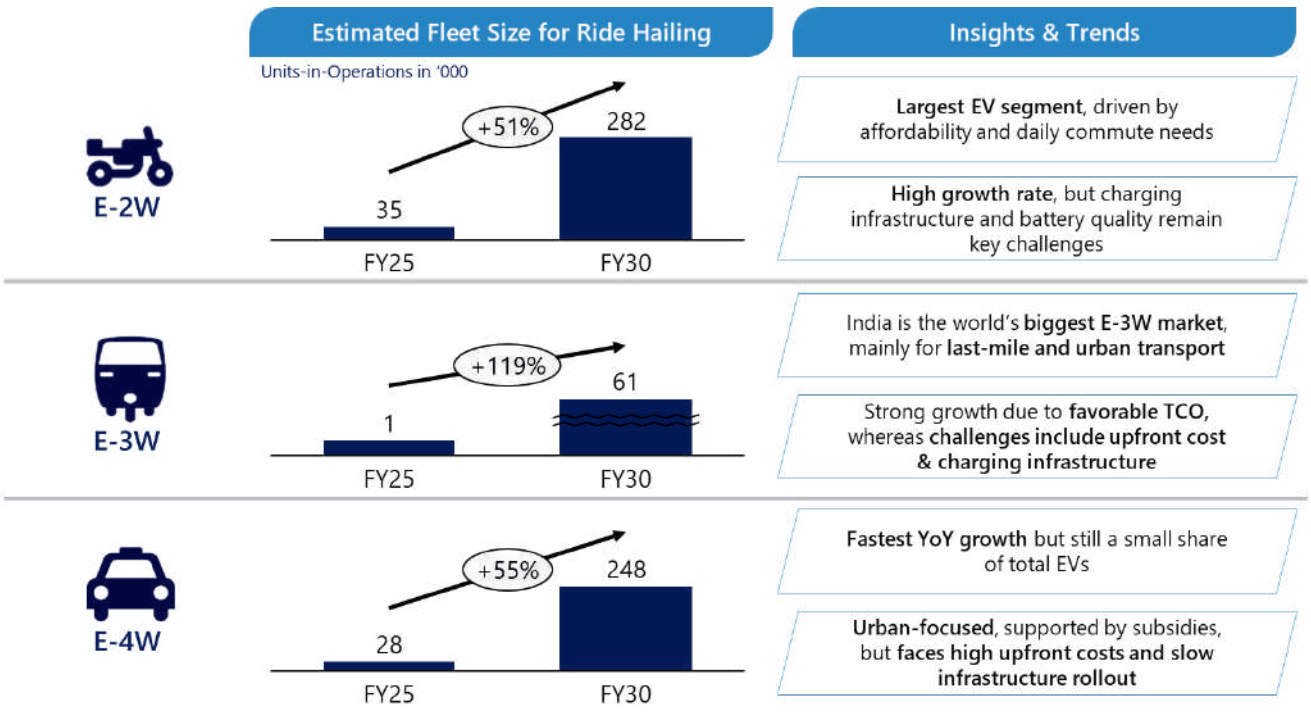
B) Challenges and Deterrents:

1. Deterring Government Regulations: Regulatory challenges are impacting the growth of ride-hailing. For instance, Delhi and Karnataka have banned bike taxis, while restrictions have been imposed on commission rates and surcharges. Additionally, the GST on listed ride-hailing services is putting a financial strain on providers.

2. Market Competition and Regulatory Uncertainty: The market is also facing regulatory uncertainty and competition, especially with new entrants like Nama Yatri trying to onboard additional companies into the mobility ecosystem.

C) EV Adoption in Ride-Hailing:

The Indian ride-hailing market is witnessing a significant shift toward electrification, with Electric Two-Wheelers (E-2Ws) and Electric Four-Wheelers (E-4Ws) leading the charge, while Electric Three-Wheelers (E-3Ws) are rapidly gaining traction, particularly in urban areas. These segments are set to experience exponential growth, with E-3Ws playing a crucial role in sustainable transportation.



Source: NRI Analysis & Estimation

E-2W (Electric Two-Wheelers):

Fleet Size Projections: The E-2W segment is the largest and fastest-growing in the ride-hailing space, projected to grow by 51% from FY25 to FY30, expanding from 35.4K to 282.1K vehicles.

Key Insights: E-2Ws are the largest EV segment, driven by affordability and the growing demand for daily commute solutions. Although the segment is experiencing high growth, charging infrastructure and battery quality remain persistent challenges.

E-3W (Electric Three-Wheelers):

Fleet Size Projections: The E-3W segment is expected to see an extraordinary growth rate of 119% from FY25 to FY30, rising from 1.2K to 61K vehicles due to a large market in the country.

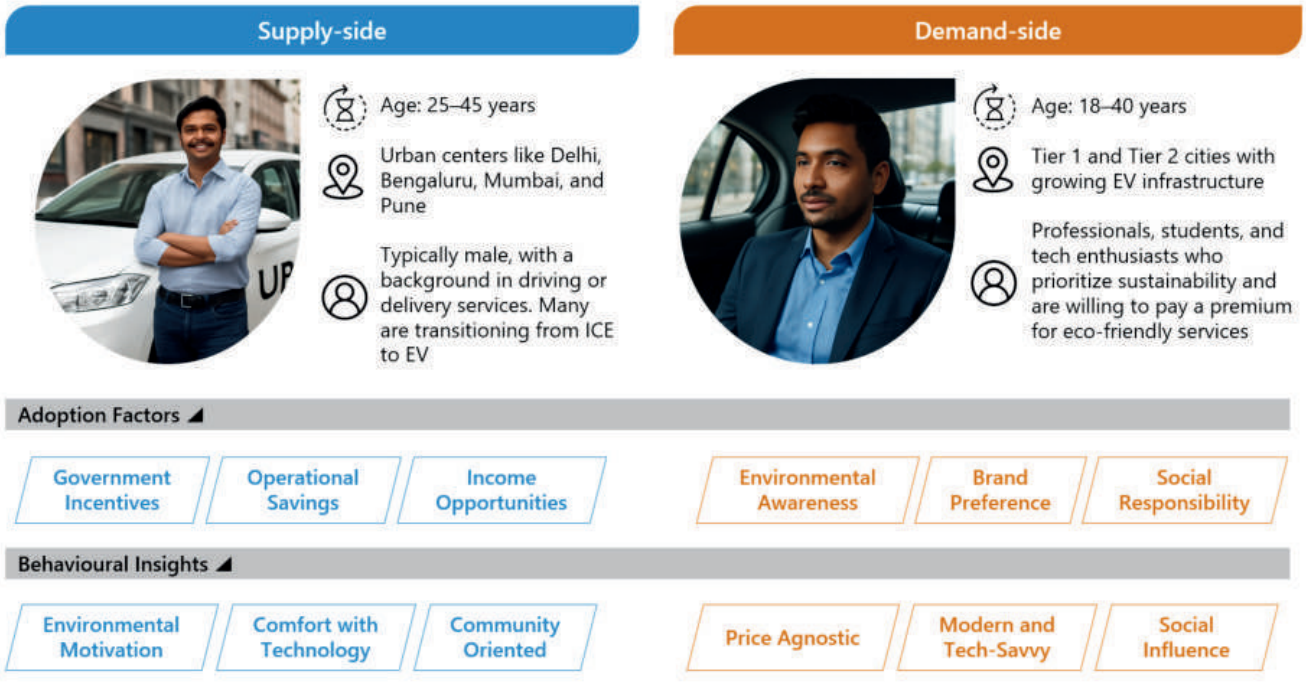
Key Insights: India holds the title of the world's biggest E-3W market, primarily for last-mile and urban transport. Growth is driven by favourable Total Cost of Ownership (TCO), but challenges remain in areas like charging infrastructure and battery efficiency.

E-4W (Electric Four-Wheelers):

Fleet Size Projections: The E-4W segment is also poised for significant growth, projected to increase by 55% from FY25 to FY30, growing from 27.8K to 248.1K vehicles.

Key Insights: E-4Ws are experiencing the fastest year-on-year growth, albeit they still represent a smaller share of the overall EV market. The segment is urban-focused, benefiting from subsidies, but faces challenges related to upfront costs and the slow rollout of charging infrastructure.

D) Driver Adoption and Behavioral Insights:



Source: Expert Interactions, NRI Analysis

The adoption of Electric Vehicles (EVs) for ride-hailing has gained momentum due to increasing driver incentives and growing customer demand for sustainable transport options. On the supply side, drivers typically aged 25-45 are transitioning from traditional Internal Combustion Engine (ICE) vehicles to EVs, particularly in urban centers like Delhi, Bengaluru, Mumbai, and Pune. These drivers are primarily motivated by government incentives, operational savings on fuel and maintenance and income opportunities from participating in the rising demand for eco-friendly transportation. Many drivers also exhibit environmental motivation, comfort with technology, and a sense of community, further driving their adoption of EVs.

On the demand side, the customers, predominantly aged 18-40 and residing in Tier 1 and Tier 2 cities with growing EV infrastructure, are also pushing the shift toward EV ride-hailing. These eco-conscious urbanites, including professionals, students and tech enthusiasts, are motivated by environmental awareness and social responsibility. They tend to be price agnostic, willing to pay a premium for sustainable services, and prefer modern, tech-savvy solutions. Brand preference plays a significant role in their decision-making, and they are influenced by social circles, making sustainability a key criterion when choosing ride-hailing services. Despite the challenges of EV infrastructure, both drivers and consumers are contributing to the shift toward more eco-friendly transportation options.

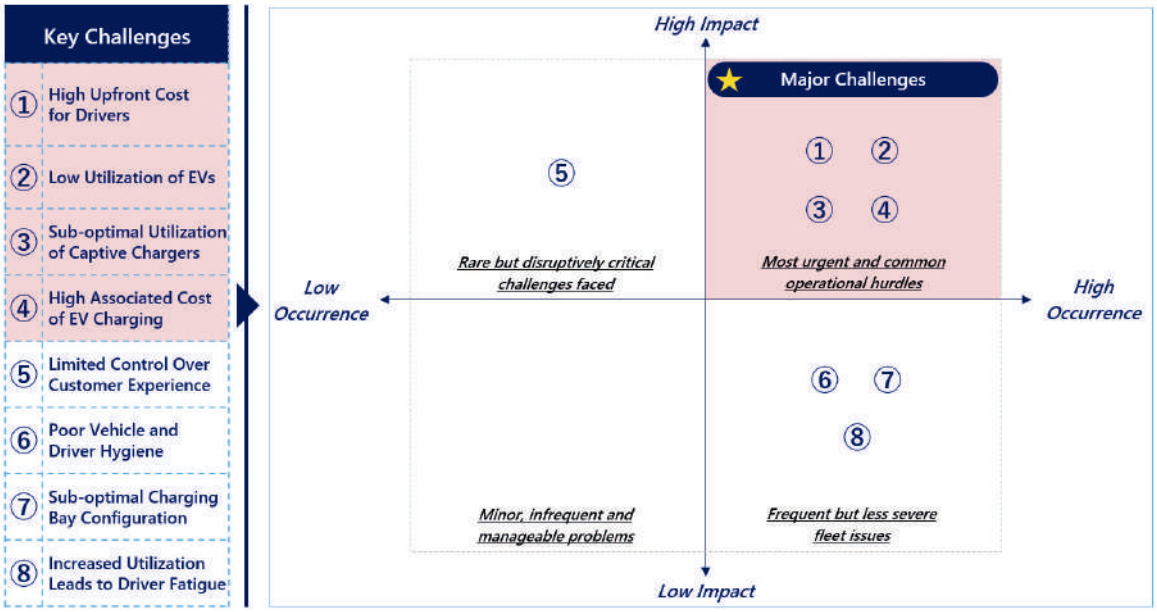
E) EV Ride Hailing Business Models:

	Business Model	Description	Indicative Players	Key Insights
①	Commission Based	Platform charges drivers a percentage (typically 20–30%) of each fare as revenue	OLA Uber	• Traditional model • Led to driver dissatisfaction due to high commissions
②	Subscription/ SaaS-Based	Drivers pay a fixed daily or periodic fee for unlimited rides; keep 100% of fare	rapido, namma yatri	• Popular for autos/bikes • Increases driver earnings and platform transparency
③	Fair Price/ Negotiation	Passengers propose a fare, whereas drivers accept or counteroffer (agreeing on a mutually acceptable price)	inDrive	• No surge pricing • Lower commissions (10–12%) than incumbents
④	Zero-Commission	No commission per ride, drivers pay a nominal fixed fee or nothing after a threshold	rapido, namma yatri	Empowers drivers, reduces platform cut & increases adoption
⑤	Fleet-Owned/ Employment	Platform owns vehicles and hires drivers on salary plus incentives	eVera	Enables quality control, consistent service & stable driver income
⑥	Hybrid/Innovative Pricing	Mix of models (e.g., subscription for autos, commission for cabs) or dynamic/ transparent pricing	OLA Uber rapido	Adapts to segment needs and competitive pressures

Source: NRI Analysis, Desktop Research

The EV ride-hailing market is undergoing significant transformation, as companies innovate to address the evolving needs of both drivers and passengers. Traditional revenue models are being challenged by new, flexible and driver-empowering approaches. The chart highlights six prominent business models, illustrating the variety of strategies being employed in the market. These models reflect a clear trend toward greater control, transparent pricing & innovative revenue approaches.

F) EV Ride Hailing Challenges:



Source: NRI Analysis, Desktop Research

Major Challenges (High Occurrence, High Impact):

- High Upfront Cost for Drivers (1): This challenge is considered both urgent and common, with a significant impact on the adoption of EVs. The high initial investment required for drivers to switch to electric vehicles is a key hurdle that needs attention.
- Low Utilization of EVs (2): This issue is also common and impactful, meaning that despite having EVs, their usage is not optimized. Addressing this could improve fleet efficiency.
- Sub-optimal Utilization of Captive Chargers (3): This issue relates to the underuse of available charging infrastructure, affecting fleet efficiency and availability.
- High Associated Cost of EV Charging (4): High operational costs related to charging are major challenges that can reduce profitability and operational effectiveness.

Rare but Disruptively Critical Challenges (Low Occurrence, High Impact):

- Limited Control Over Customer Experience (5): While less frequent, the inability to manage customer experience is identified as a critical concern that can significantly affect brand loyalty and operational outcomes.

Frequent but Less Severe Fleet Issues (High Occurrence, Low Impact):

- Poor Vehicle and Driver Hygiene (6): This is a common but less impactful challenge. Addressing it could lead to higher customer satisfaction and better operational standards, but it's not as critical as the other issues.

- Sub-optimal Charging Bay Configuration (7): This problem affects the efficiency of charging stations but doesn't have as severe an impact compared to other challenges.

- Increased Utilization Leads to Driver Fatigue (8): While frequently encountered, this issue is more about managing driver well-being and operational scheduling to prevent burnout.

Implications of the Challenges:

- Focus Areas: Immediate attention should be given to issues like high upfront costs, low EV utilization, and high charging costs. These are key operational hurdles that significantly affect the fleet's effectiveness.

- Strategic Improvements: While the other challenges, such as poor hygiene and driver fatigue, may not have the same level of impact, addressing them would enhance the overall customer experience and operational efficiency.

G) Technology and Data-Driven Fleet Optimization:

- Predictive Maintenance: AI systems analyze vehicle data and use machine learning and digital twins to predict component wear and breakdowns, enabling proactive, simulation-based maintenance and optimization.

- Route Optimization: Machine learning processes real-time and historical traffic data, allowing AI-powered systems to dynamically adjust delivery routes for improved fuel efficiency and on-time performance.

Source: NRI Analysis, Secondary Research

- Fuel Efficiency: AI analyzes driver habits and vehicle data to recommend targeted training or vehicle adjustments, helping reduce fuel consumption and operational costs over time.

- Fleet Safety: Advanced AI and telematics monitor driver actions in real-time, alerting managers to risky behaviours and compliance issues, thus improving fleet safety and reducing violations.

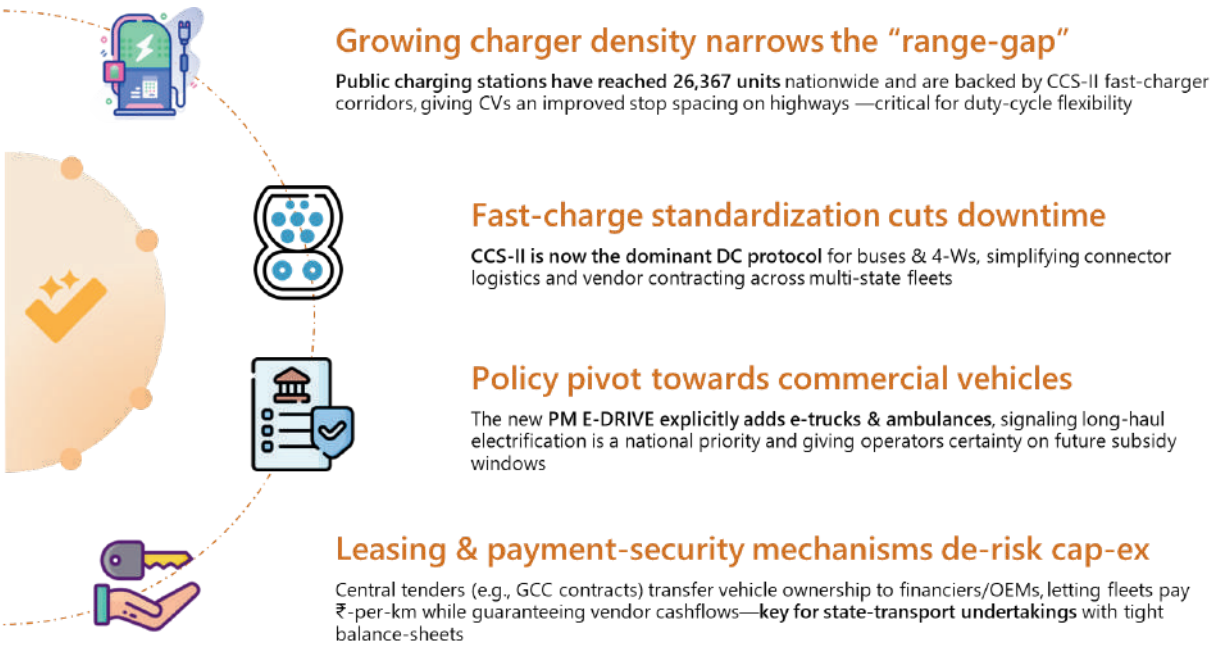
- 360-Degree Visibility: AI platforms aggregate diverse fleet data, delivering real-time operational insights that support better decision-making and reveal trends not visible from isolated sources.

6. Secrets to Building a Winning EV Fleet

6.1 Key Success Factors for Fleet Operators

Fleet operators that want to run electric trucks and buses at scale need four things to fall into place at the same time. First, India now has more than 26,000 public fast-charging points on record. Because new chargers follow major highways at regular intervals, drivers no longer worry about being stranded between cities. Shorter gaps between stops make it easier to design routes that stay within a battery's range.

Second, almost every new heavy-duty charger and vehicle now uses the CCS-II connector. When every plug fits every socket, fleets do not have to buy special adapters or sign multiple vendor contracts. Standardisation also speeds up each charging stop, trimming precious minutes that would otherwise eat into a driver's duty cycle.



Source: Desktop Research, NRI Analysis

Third, national policy is finally pointing directly at commercial vehicles, not just passenger cars. The government's new "PM E-DRIVE" programme puts e-trucks, e-buses and even electric ambulances on its priority list. That signal matters: once operators see a clear, long-term subsidy window, they feel safer placing large purchase orders and investing in depot infrastructure.

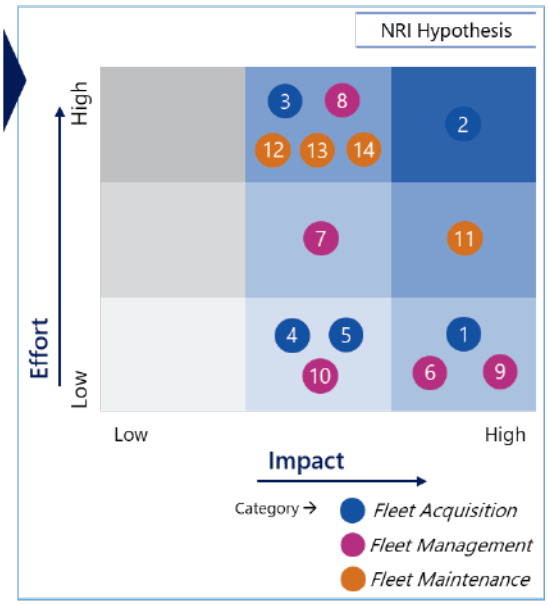
The fourth factor tackles the biggest pain point of all—high upfront cost. Under gross-cost-contract (GCC) tenders, vehicle ownership shifts to a financier or an original-equipment manufacturer. Fleet operators simply pay a fixed rupee-per-kilometre fee while the owner guarantees vehicle availability. This lease-and-pay-per-use model keeps balance sheets light and gives cash-strapped state transport undertakings a way to modernise without huge capital outlays.

When dense charging, a single fast-charge standard, supportive policy and cap-ex-free leasing line up, the risks that once held fleets back—range anxiety, downtime, policy uncertainty and balance-sheet stress—shrink sharply. The result is higher vehicle uptime, clearer cost forecasts and faster, safer expansion of electric fleets across India's highways and city routes alike.

6.2 Strategies for Fleet Acquisition, Management, and Maintenance

Running a high-uptime electric fleet is about smart contracts and data-driven tools as much as the vehicles themselves. Big wins come from ideas that are easy to adopt yet deliver major savings. Bidding for buses or trucks under gross-cost contracts, where an OEM or investor owns the asset and the operator pays only a rupee-per-kilometre fee, removes the burden of upfront capital while guaranteeing availability. Adding battery-as-a-service deepens that benefit, because the most expensive component—about half the vehicle cost—can be swapped or charged separately, keeping trucks moving. Front-loading state and central subsidies and locking in buy-back or extended warranties further cut risk at acquisition.

1	Shift to Gross-Cost-Contract (GCC) or dry-lease tenders	Bid for vehicles "as-a-service" so the operator only pays a ₹/km fee; cap-ex sits with OEM/investor
2	Adopt Battery-as-a-Service (BaaS)	Lease the battery (40-50 % of vehicle cost) and swap or charge it separately
3	Tap green loans & blended finance	Use SIDBI concessional lines, green bonds or bank "EV only" products
4	Negotiate OEM residual-value & warranty packs	Lock in buy-back, extended service & battery warranties to de-risk resale
5	Claim purchase-tax waivers & FAME/PM E-Drive incentives	Front-load state & central subsidies
6	Roll out cloud AI fleet-management platforms	Dynamic dispatch based on SOC, nearest charger & trip demand
7	Build or co-invest in high-power depot hubs	200-400 kW chargers at 100-150 km highway intervals; sell spare kWh to others
8	Plug into open-API charger directories (OCPI)	Eliminate "where do I charge?" friction by integrating every CPO into one view
9	Embed Telematics & IoT for live battery + route optimization	Use AIS-140 GPS, CAN data & tyre sensors to cut idle time and energy waste
10	Continuous driver & technician up-skilling	Short courses on regenerative braking, SOC-friendly driving & HV safety
11	Predictive analytics maintenance	Use vibration, temperature & BMS data to fix issues before breakdowns
12	Partner with OEM or 3P garages for pooled service hubs	Share pits, spares and trained EV techs instead of building your own workshop every city
13	Build circularity—battery 2nd-life & recycling tie-ups	Sell or repurpose packs for stationary storage; lock in recycler contracts early
14	Deploy a 'Battery Passport' on every pack	Track state-of-health digitally to improve resale value and financing terms



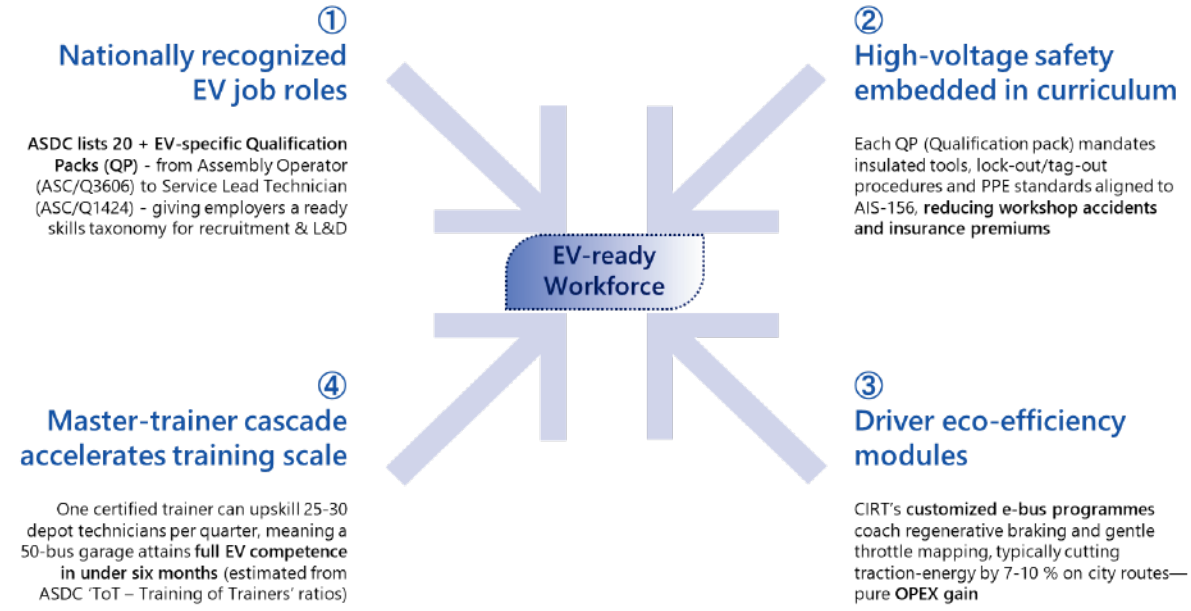
Source: NRI Analysis

Digital tools deliver the next layer of value. Cloud dispatch platforms automatically route a vehicle to the nearest charger using live state-of-charge data. Open-API charger directories erase "where do I plug in?" confusion, while AIS-140 telematics and tyre sensors trim idle time and wasted energy. Predictive analytics goes further, flagging vibration or temperature issues before they cause breakdowns. Finally, sharing workshops with OEM partners and planning for second-life battery use turns maintenance from a cost centre into an earnings stream. Together, these steps create an electric fleet ready for routes.

6.3 Talent and Workforce Training for EV Fleets

A switch to electric fleets demands more than swapping engines for batteries; it requires people who can operate, maintain, and drive these new machines safely and efficiently. India now has a clear pathway for building that workforce. The Automotive Skills Development Council (ASDC) has created more than twenty electric-vehicle "Qualification Packs," covering roles from entry-level assembly operators to senior service technicians. Because these job standards are nationally recognised, fleet owners can recruit against a common skills taxonomy and design learning-and-development plans that slot directly into their depots.

Safety sits at the heart of every course. Each qualification embeds high-voltage protocols: insulated tools, lock-out/tag-out steps, and personal protective equipment rules aligned to the AIS-156 standard. By teaching these practices from day one, workshops cut the risk of arc flashes and battery fires, which in turn lowers insurance premiums. For drivers, the Central Institute of Road Transport (CIRT) offers eco-efficiency modules that focus on regenerative braking and smooth throttle control. Real-world pilots show that trained e-bus drivers can trim traction-energy use by seven to ten per cent on city routes—an operating-expense gain achieved without spending a single rupee on hardware.



ASDC: Automotive Skills Development Council | CIRT: Central Institute of Road Transport
Source: ASDC Website, CIRT Website (Accessed on 7 Jul 2025)

Scale is delivered through a "master-trainer cascade." Under ASDC's Training-of-Trainers model, one certified instructor can upskill twenty-five to thirty depot technicians every quarter. A garage running fifty buses, therefore, reaches full electric-vehicle competence in less than six months, even if it starts with zero EV experience. Because the curriculum is modular, operators can blend classroom sessions with on-the-job mentoring, keeping vehicles on the road while staff build skills.

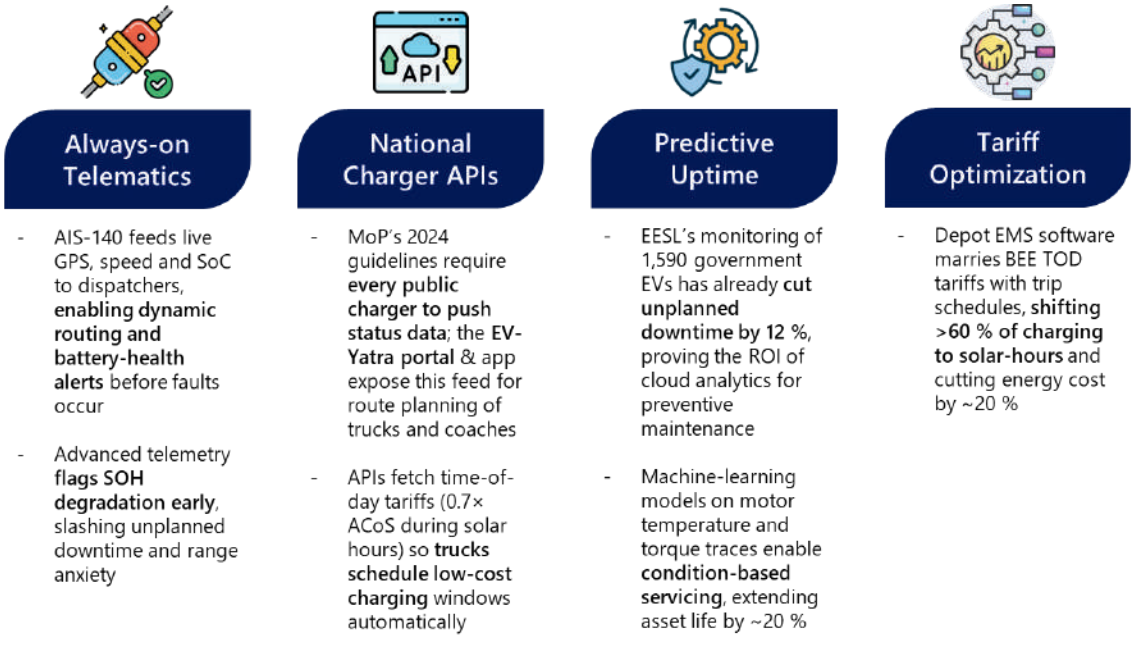
Together, nationally recognised roles, embedded safety, efficiency coaching, and rapid cascade training create an EV-ready workforce that spans every depot function. These pipelines remove a critical bottleneck in India's electrification journey, ensuring that hardware investments are matched by human capability and that electric fleets run safely, economically, and at scale.

6.4 Leveraging Data Analytics and IoT for Fleet Efficiency

Electric fleets generate a steady stream of data every time a vehicle moves, plugs in, or idles. When this information is captured and analysed in real time, operators can turn what used to be guesswork into precise, money-saving decisions.

The starting point is "always-on" telematics. Under the AIS-140 standard, every bus or truck transmits live GPS position, speed, and battery state-of-charge to the control room. Dispatchers can reroute vehicles around traffic or bad weather and, more importantly, receive automatic battery-health warnings before a fault leaves a driver stranded. Because the system also tracks state-of-health degradation, depots can retire or repurpose packs before range loss becomes a problem.

Data doesn't stop at the vehicle. From 2024, the Ministry of Power rules require every public charger to publish live status and pricing through an open API. The EV-Yatra portal consumes this feed, so route-planning software can see which chargers are free, their power rating, and the exact tariff at any hour of the day. Trucks can now schedule refuelling stops when solar-rich "day tariffs" are roughly 30 percent cheaper than the evening peak.



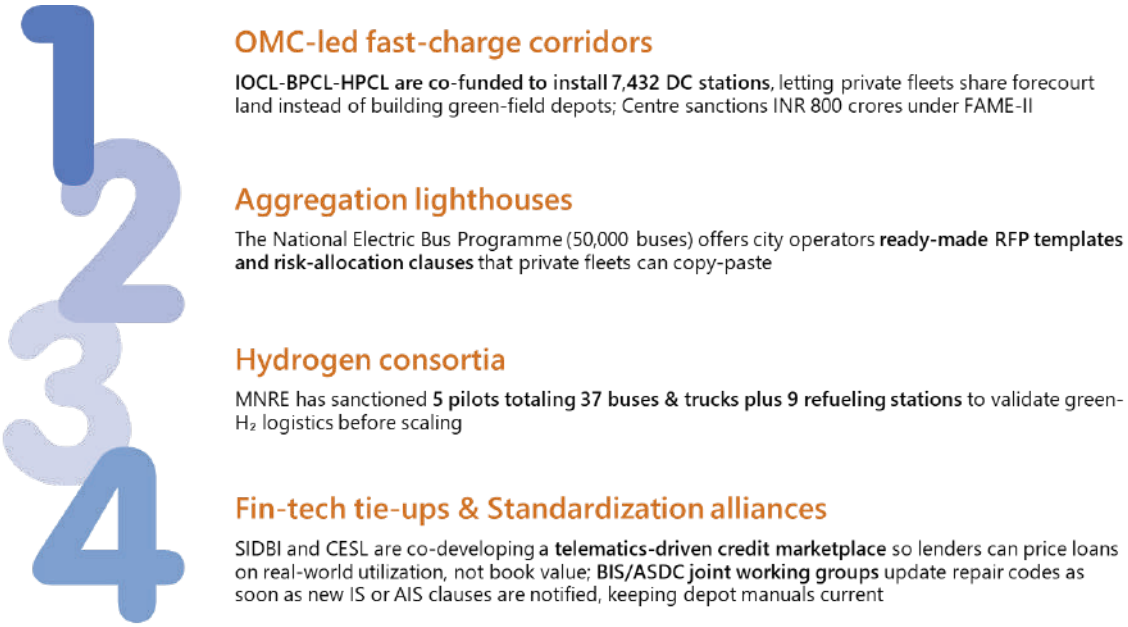
Source: PIB Notifications, MoRTH Website, Desktop Research, BEE TOD Framework

Predictive maintenance closes another costly gap. Energy-service company EESL tracks motor temperature and torque signatures across more than 1,500 government EVs. Machine-learning models sift the data and flag anomalies, prompting workshops to service a component before it fails. Early results show a 12 per cent cut in unplanned downtime and a 20 per cent extension in overall asset life—proof that cloud analytics pays for itself.

Finally, depot energy-management software ties everything together. By matching Bureau of Energy Efficiency time-of-day tariffs with trip schedules, fleets have shifted over 60 per cent of charging to sunlit hours, trimming electricity bills by about one-fifth. In short, real-time data streams, open APIs, and predictive algorithms are turning electric-fleet operations from a logistical headache into a finely tuned, cost-efficient system.

6.5 Partnerships and Ecosystem Collaboration

India's push for zero-emission fleets is moving faster when companies join forces instead of working alone. A first example is the alliance between the state-owned oil marketing companies—Indian Oil, Bharat Petroleum and Hindustan Petroleum—and charge-point operators. Together, they are installing more than 7,400 direct-current fast chargers on existing fuel-station forecourts. Because the land and power lines are already in place, private bus and truck fleets can top up at highway locations without building expensive green-field depots. The central government has backed the roll-out with an ₹800-crore grant under FAME-II, turning a potential cost barrier into a shared national asset.



Source: PIB Notifications, MNRE Website, BIS Weekly Bulletin & ASDC Circulars, SIDBI Website

Collaboration also helps buyers pool demand. The National Electric Bus Programme, which targets 50,000 e-buses, gives city transport undertakings a ready-made set of request-for-proposal templates and risk-allocation clauses. Private operators can copy the documents word for word, saving months of legal work and entering tenders with clear rules on battery warranties, availability penalties and payment security. By aggregating orders, cities win lower per-bus prices, while manufacturers gain the scale to localise components.

Not every partnership is about batteries. The Ministry of New and Renewable Energy has funded five hydrogen-mobility pilots that bundle 37 buses and trucks with nine refuelling stations. These consortia bring together truck makers, green-hydrogen producers and logistics firms to solve storage and safety issues before larger fleets commit capital. Lessons learned—from tank design to driver training—flow straight into the next funding round, de-risking a technology that could serve ultra-long-haul routes where batteries struggle.

Finance and standards bodies are joining the ecosystem too. SIDBI and Convergence Energy Services Ltd are building a telematics-driven credit marketplace where lenders price loans on a vehicle's real-world utilisation rather than book value, lowering interest rates for high-uptime operators. Meanwhile, BIS and ASDC working groups update repair codes the moment a new Indian Standard or Automotive Industry Standard is released, ensuring that depot manuals and training materials stay current.

By weaving together infrastructure, procurement, technology pilots and finance, these partnerships remove duplication, reduce costs and create an interoperable, future-proof charging network that benefits every fleet.

7. Future Roadmap and Strategic Way Forward

7.1 Recommendations to Accelerate Adoption of e-CVs

Recommendations

1. **Building a multi-layer energy ecosystem** – combine fast-charging, battery-swapping and modular micro-hubs located in demand clusters; partnerships with utilities/CPOs early.

2. **OEMs should provide battery safety and performance guarantees**; align chemistry (LFP/NMC) and swappable pack formats to duty cycles to protect uptime and residual value.

3. **Adopt flexible financing models** – lease-to-own, pay-per-km, or battery-as-a-service to slash upfront capex and match cash-flows to utilization.

4. **Make "uptime%" the north-star KPI** – deploy predictive maintenance, remote diagnostics and decentralized service kiosks that guarantee < 30-minute turnaround.

Founder & CEO, EV OEM

"Success for fleet operators will depend on operational efficiency, smart financing, and uptime-driven service models. Key factors are - right vehicle mix tailored to use-case and region, predictive maintenance and telematics to reduce breakdowns, mini hubs and decentralized service centers to ensure quick turnaround and maximize uptime, modular charging and swapping infra close to demand zones and flexible leasing/financing aligned with usage patterns..."

Project Manager, Connected Logistics Solutions Firm

"First, battery performance guarantee by OEMs and fast charging infrastructure will tilt balance towards EVs by fleet operators. Additionally, EV fleet owners need to innovate and improvise operational execution to improve TCO."

5. **Fleet Operators to invest in an integrated telematics & AI control-tower –** real-time monitoring of SOC, driver behaviour, and route energy demand enables dynamic dispatch and load-balancing.

6. **Use data-driven heat-maps to plan charger expansion –** place new stations where trip density and idle time justify payback; review every 3–6 months.

7. **Run continuous driver programmes –** incentives, safety refreshers, and EV-specific eco-driving tips can lift range and cut accidents.

National Corporate/ B2B Sales Lead, EV OEM

"Optimized route planning, driver training, uptime maximization, and battery lifecycle management are key success factors... Centralized fleet monitoring systems and predictive maintenance will become standard."

Head of Finance, Financial Advisory Firm

"Success factors for scaling EV fleets include robust charging infrastructure, reliable battery technology, and strong partnerships with charging providers and OEMs. Fleet managers must prioritize TCO analysis, right-sizing fleets, and leveraging leasing models to manage capital and technology risks. Advanced telematics, AI-driven route optimization, and predictive maintenance will be essential for operational efficiency. Over the next 3-5 years, fleet management strategies must adapt by integrating real-time data analytics, flexible mobility solutions, and sustainability policies. Aligning with evolving regulations and investing in continuous driver training will also be critical for successful, large-scale electrification."

8. **Standardize on modular, upgradable vehicle platforms** to allow battery, motor or software swaps without full asset replacement.

9. **Develop SLA-backed OEM & supplier partnerships –** parts availability, battery health analytics, and field-service response times should be contractually locked.

10. **Embed circular-economy levers early –** second-life batteries for stationary storage, certified recycling , and traceability improve TCO and ESG scores.

11. **Create mini-hubs (< 10 km radius)** for quick charging, rest and light service to minimize dead-kilometers and driver downtime.

Managing Director, Energy Storage Solutions Firm

"Scaling EV fleets in India within the next 3-5 years isn't just about acquiring vehicles; it's about orchestrating an intelligent, financially resilient, and integrated electric ecosystem. Success hinges on proactive strategies that blend cutting-edge technology, innovative financing, and adaptive operational excellence."

Director, Technology Trading Firm

"For successful EV fleet , the operator must select an OEM who has best Total cost of ownership and high range EV. I feel, OEM and Fleet operators will join hands to improve EV penetration."

12. **Shift from asset ownership to energy-route-rider orchestration** – treat vehicles as nodes in a service network, optimized centrally via software.

13. **Strengthen supply-chain resilience** – dual-source batteries & critical components, maintain buffer inventory, and digitize spares ordering.

14. **Utilize policy / carbon-credit opportunities** – state-level EV subsidies, FAME III incentives, and battery-recycling credits can move project IRR by 2-4 pp.

15. **Institutionalize cross-functional governance** – finance, ops, IT, and ESG teams should jointly track KPIs (uptime, ₹/km energy cost, km per technician, etc.) on a monthly dashboard.

7.2 Strategic Imperatives for Stakeholders

	Stakeholders	Suggested Actions	Evidence-based Pay-off
①	Fleet operators	Sign **kilometer-rate (GCC) or lease contracts** rather than purchase outright	Removes upfront cap-ex; GCC bids win on per-km cost under FAME-II tenders
②	OEMs & suppliers	**Localize** motors, controllers and packs under PLI schemes	Helps meet 60 % domestic-value targets by FY-29 and buffers global supply shocks
③	Financiers	Offer **loans pegged to verified battery residual values** and fleet utilization	Business-model diagrams show split-loan + BaaS structures reduce default risk for banks
④	Utilities / DISCOMs	Roll out **TOD-linked tariffs** and fast-track high-capacity feeder upgrades	Infrastructure investment is significantly more effective than purchase subsidies for driving EV uptake
⑤	State Transport Undertakings	**Synchronize bus orders** with PM E-Drive timelines to capture maximum grant share	PM E-Drive explicitly prioritizes buses, making early movers eligible for higher subsidy slabs

Source: Based on Industry Stakeholders Consultation

India's electric-vehicle transition will only succeed if every link in the chain moves together, and each group has a distinct job to do. Fleet operators should stop buying buses and trucks outright and instead sign kilometre-rate leases or gross-cost contracts. Paying a fixed rupee-per-kilometre fee removes the shock of upfront capital and already helps bidders win FAME-II tenders. OEMs and component suppliers must localise motors, controllers and battery packs under the government's production-linked incentive schemes. Hitting a 60 per cent domestic-value threshold by FY-29 protects fleets from future import bottlenecks while creating local jobs.

Financiers need new lending models. Loans pegged to verified battery residual values and actual fleet utilisation, often combined with battery-as-a-service contracts, lower default risk because repayments track the asset's real earning power. Utilities and DISCOMs can accelerate demand more effectively than any purchase subsidy by introducing time-of-day electricity tariffs and fast-tracking high-capacity feeder lines to depots. Cheap midday rates encourage fleets to charge when solar power is abundant, smoothing the grid and cutting operator costs.

Finally, State Transport Undertakings should time their bus orders to the PM E-Drive programme. Early movers will secure the highest grant slabs, stretching tight public budgets and demonstrating the viability of large-scale electric transport systems.

7.3 Roadmap for Scaling Fleet Electrification in India

India's route to 30 per cent electric commercial-vehicle (CV) sales by 2030 unfolds in three clear stages that link policy, hardware, people and power grids.

Indicative Phases ➤➤➤➤ ➤➤➤➤

	2024-26 Kick-start	2027-30 Scale-up	2031-35 Maturity
Vehicles	**Subsidise e-LCVs & e-buses under PM E-Drive**; pilot 100 hydrogen FCEV trucks on long corridors	**Mandate 50 % e-bus procurement for STUs**; OEM launch of 350 km-range e-HCV	**Phase-out new diesel 4-w for urban freight**; **80 % zero-emission bus fleet**
Infrastructure	**72 k public chargers funded**; one depot-scale 1 MW charger per logistics hub	**Achieve 40:1 EV-to-charger** national ratio and 1 km grid density in metros	**Full V2G integration**; 30 % depot energy self-generated via rooftop solar
Skills & Jobs	**Train technicians** via ASDC EV Q-packs; certify first-responder drivers	**Integrate EV modules into ITI** curricula; launch "battery technologist" skilling fund	**Create 0.5 M green-mobility jobs** across maintenance, software & recycling
Policy Milestones	**Notify FAME-III with truck inclusion**; finalize battery-swapping rules	Implement **uniform green-plate toll rebates**; dynamic ToD tariffs nationwide	Introduce **carbon-credit trading** for fleet CO_2 cuts; sunset of purchase subsidies

Source: PIB Notifications, Policy Documents, NITI Aayog & MoP Reports

2024-26 is the kick-start window. The new PM E-Drive scheme subsidises electric light-commercial vans and city buses, while a government-backed pilot puts one hundred hydrogen fuel-cell trucks on long-haul corridors to test refuelling logistics. On the ground, 72,000 public chargers are already funded; every major logistics hub receives at least one one-megawatt depot charger so trucks can top up during loading breaks. Workforce preparation begins with Automotive Skills Development Council courses that certify technicians and first-responder drivers in high-voltage safety. Regulators, meanwhile, ready the next wave of incentives by notifying FAME-III—with electric trucks formally included—and by setting national rules for battery swapping.

2027-30 marks the scale-up phase. Half of all new state-transport-undertaking buses must be electric, and manufacturers roll out heavy trucks capable of 350 kilometres on a single charge. Charger density improves to one unit for every forty EVs nationwide, and in metro areas, a one-kilometre grid connection standard ends “last-mile” power bottlenecks. Electric-vehicle modules enter Industrial-Training-Institute curricula, and a dedicated “battery technologist” fund expands the talent pool. Financial levers also mature: a uniform green-plate toll rebate and dynamic time-of-day electricity tariffs reward operators that charge during solar-rich hours, cutting both costs and grid stress.

2031-35 delivers full maturity. New diesel four-wheelers for urban freight are phased out, and 80 per cent of India’s bus fleets run on zero-emission powertrains. Depots adopt vehicle-to-grid integration, exporting stored energy back to the network, while rooftop solar meets 30 per cent of their own demand. A half-million green-mobility jobs span maintenance, software, and battery recycling. Purchase subsidies taper off, replaced by a carbon-credit trading scheme that lets fleets monetise verified CO_2 cuts, locking in a self-sustaining, low-carbon freight ecosystem.

Authors

PREETESH SINGH

Principal
Email:
preetesh.singh@nriindia.co.in

RAGHAV MISHRA

Senior Manager
Email: raghav.mishra@nriindia.co.in

Co-authors

BEAUTY KUMAR

Consultant
Email: beauty.kumar@nriindia.co.in

VICTOR BANERJEE

Consultant
Email: victor.banerjee@nriindia.co.in

YASH PUNDLIK

Consultant
Email: yash.pundlik@nriindia.co.in

ANKIT SHARMA

Senior Associate Consultant
Email: ankit.sharma@nriindia.co.in

ANSHIKA JETLY

Senior Associate Consultant
Email: anshika.jetly@nriindia.co.in

Nomura Research Institute is a Global Think Tank and the Largest Consulting Firm in Japan. Established in 1965, it now has 24 Global Offices in 13 Countries with more than 10,000 employees worldwide.

Automotive Industry is the core industry vertical within the Consulting Division. The GPG (Global Practice Group) for Automotive has more than 100 consultants engaged in the Automotive space, helping clients in developing winning strategies and their implementation cutting across the automotive value chain.

CASE (Connected Autonomous Shared Electric) is one of the key expertise areas where NRI delivers projects for clients and acts as a think tank helping industry associations and government bodies in developing policies.

NRI Consulting & Solutions India was established in 2011, and is based out of Gurugram with over 50 consultants dedicated to Automotive.

https://india.nri.com/industries/automotive/

General Disclosures

- This report is for our close associates only. Other than disclosures relating to Nomura Research Institute, this report is based on current public information that we consider reliable, but we do not represent accuracy or completeness, and it should not be relied on as such.

- The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

- Reproduction or dissemination, directly or indirectly, of research data and reports of NRI's analysis in any form is prohibited except with the written permission of NRI.

- The report includes predictive statements which represent NRI's assumptions and expectations in the light of currently available information. These projections and forecasts are based on industry trends, news articles, estimates shared by Global agencies, an estimation model including probabilities, regression, correlations, etc., circumstances and factors which involve risks, variables and uncertainties. The actual performance of the parameters represented in the report may vary from those projected.

- The industry opinions presented are based on a comprehensive survey conducted by EVreporter & Nomura Research Institute India, gathering insights from veteran industry experts representing various segments of the electric vehicle value chain, including OEMs, Suppliers, Academia, R&D Institutes and Think Tanks. The responses have been categorized to provide a coherent representation of the industry's perspectives.

Prepared By

NOMURA RESEARCH INSTITUTE
CONSULTING & SOLUTIONS INDIA PVT. LTD.

https://www.nri.com
https://www.india.nri.com