

Charting India's Mobility Revolution: Findings from the Global Bharat Mobility '25 a Field Study on Sustainable and Technology-Driven Automotive Transformation

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Abstract: The Bharat Mobility Global Expo 2025, organized under the aegis of the Ministry of Commerce & Industry, Government of India, served as a landmark event for the Indian mobility ecosystem. Participating as part of the Bharat Mobility initiative, I undertook a field-based research project, attending the expo on three separate days to analyze the evolving trends and technologies in the automotive industry. This paper presents key insights into electric mobility, market demand, sustainable innovations, and industry challenges, as well as personal reflections on interactions and learnings gathered during the event. The research, based on field visits, employs primary data (observations, discussions, consumer interviews) and secondary sources (news coverage, government reports) to provide a holistic analysis of India's automotive transition. Key findings highlight the interplay between government and industry collaboration, the rapid rise of electric and alternative fuel vehicles, the role of digital technologies in redefining automotive design, and evolving consumer expectations. The study also identifies challenges such as infrastructure deficits, financing bottlenecks, and rural-urban divides in adoption. By combining structured analysis with personal reflections, this paper argues that India is poised at the cusp of a mobility revolution—an epoch where technological strength, sustainable imperatives, and consumer aspirations converge to reshape the nation's transportation future.

Keywords: Bharat Mobility; Electric Vehicles; Automotive Industry; Sustainability; Policy; Consumer Trends; India.

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I. INTRODUCTION

This India's automotive sector is undergoing a transformative shift toward sustainability, automation, and intelligent mobility. This is driven by India's commitment to the Paris Climate Accord, its aspiration to achieve net zero by 2070, and its pledge under the EV30@30 campaign. The Bharat Mobility Global Expo 2025, organized by the Ministry of Commerce & Industry, Government of India, served as a major convergence point for future-focused transportation solutions. The expo was a defining event in this transition, bringing together a remarkable spectrum of stakeholders—automakers, component manufacturers, policymakers, consumers, and startups. Unlike traditional auto expos, Bharat Mobility framed mobility as an ecosystem encompassing energy, infrastructure, digital integration, and consumer lifestyles.

As a delegate under the Bharat Mobility initiative, I attended the expo on three different days and conducted a comprehensive field analysis covering electric vehicles,

green fuels, market behavior, and cutting-edge automotive technologies. Each visit focused on distinct dimensions—policy and industry perspectives (Day 1), technical and market analyses (Day 3), and consumer trends (Day 5).

➤ *This Research Paper Seeks to Provide:*

- An overview of policy directions and industry-government collaboration.
- An analysis of emerging technologies and innovations.
- Insights into consumer mindsets and behavioral shifts.
- A reflection on infrastructural and economic challenges.
- Personal narratives illustrating how policy, industry, and public perception are interlinked.

II. LITERATURE REVIEW: GLOBAL AND INDIAN CONTEXT

The transformation of mobility is not unique to India. Across the globe, nations are rethinking transportation models to align with sustainability, efficiency, and digital

integration. A review of global literature highlights comparative trajectories that place India's journey into perspective.

➤ *Global Landscape*

- China leads the EV revolution with 60% of global EV sales in 2023, driven by aggressive subsidies, battery manufacturing dominance, and infrastructure deployment.
- The European Union emphasizes carbon neutrality and strict emission norms, pushing automakers toward EVs, hydrogen, and circular economy models.
- The United States, with the Inflation Reduction Act, has incentivized EV adoption while supporting domestic supply chains for batteries and rare earths.
- Japan and South Korea continue to champion hydrogen fuel cell vehicles, reflecting their energy diversification strategies.

➤ *Indian Context*

India's mobility transition has been shaped by:

- Policy frameworks such as FAME-II (Faster Adoption and Manufacturing of Electric Vehicles), PLI (Production Linked Incentive) Scheme for Automobiles, and National Electric Mobility Mission Plan (NEMMP 2020).
- The surge of domestic champions like Tata Motors and Mahindra Electric, complemented by global entrants such as Hyundai and MG.
- A consumer market deeply influenced by affordability, efficiency, and aspirational value, making SUVs and mid-segment EVs particularly popular.
- Persistent structural challenges: high upfront EV costs, limited charging networks, and financing hurdles.

Literature indicates that while India lags behind China and Europe in absolute EV numbers, its rate of growth and domestic innovation ecosystem position it as a formidable global player.

III. METHODOLOGY

This research integrates field-based qualitative inquiry with secondary data analysis. The study involved three separate visits to the expo (Day 1, Day 3, and Day 5).

➤ *Research Visits*

- Day 1 (Industry and Policy Focus): Attendance at inaugural sessions, keynote addresses by government officials, and product unveilings.
- Day 3 (Technical and Market Analysis): Engagement with industry professionals, participation in a closed-door panel on EV infrastructure, and technical demonstrations.
- Day 5 (Public Response and Consumer Trends): Interaction with general visitors, including students, professionals, and families, alongside informal consumer

surveys.

➤ *Data Sources*

- Primary Data: Direct observations, conversations with engineers and company representatives, seminar notes, consumer interviews.
- Secondary Data: Reports from AutocarPro, Financial Express, GoodReturns, government policy documents, and press releases from companies.

This mixed-method approach ensures both breadth (macro trends) and depth (lived experiences and micro-level insights).

IV. FINDINGS AND MARKET ANALYSIS

The expo underscored the centrality of electric mobility and a shift towards technology-driven innovations. The key findings from the field study reveal a dynamic market shaped by a confluence of policy, technology, and consumer behavior.

➤ *Strong Government-Industry Collaboration*

The Ministry of Commerce & Industry projected Bharat Mobility as a nation-building exercise, emphasizing India's readiness to emerge as a global mobility hub. Key themes included the alignment with the "Make in India" initiative to boost domestic manufacturing and incentives for green energy adoption and localization of supply chains. This collaboration was visible not just in speeches but in tangible partnerships, with memoranda signed between Indian startups and global technology firms.

➤ *Rise of Electric and Alternative Fuel Vehicles*

The expo underscored the centrality of electric mobility. Tata Motors and Mahindra Electric unveiled complete EV portfolios across price ranges. Hyundai showcased its global EV line adapted for Indian conditions. Maruti Suzuki highlighted flex-fuel and hybrid strategies, signaling a transitional pathway. Hydrogen fuel cell prototypes and battery-swapping stations attracted attention, though both remain at nascent stages in India. India's goal of 30% EV penetration by 2030 remains ambitious but plausible, provided infrastructure and financing expand rapidly.

➤ *Technology-Driven Innovations*

Digitalization is redefining mobility. Observed innovations included AI-enabled driver assistance and autonomous navigation systems. 5G-ready connected dashboards enabled real-time diagnostics and entertainment. Software-defined vehicles (SDVs) were a key focus, emphasizing cars as "computers on wheels." Startups developed predictive battery management systems, reflecting India's IT and AI strengths spilling into automotive innovation.

➤ *Shifting Consumer Mindsets*

Interactions with visitors revealed a generational shift in mobility aspirations. SUVs dominate, holding 55% of

market share, reflecting status, utility, and aspirational value. Urban consumers increasingly prefer EVs in the ₹10–15 lakh segment, where affordability intersects with tech appeal. Younger buyers prioritize features such as connectivity, efficiency, and environmental consciousness over brand loyalty.

➤ *Challenges to Address*

Despite optimism, structural barriers persist:

- **Charging Infrastructure:** Sparse and unevenly distributed.
- **High Upfront Costs:** Even with subsidies, EVs remain pricier than ICE equivalents.
- **Urban-Rural Divide:** Adoption remains concentrated in metro cities.
- **Financing Models:** Lack of robust leasing, resale, and financing ecosystems for EVs.

V. CASE STUDIES: KEY INDUSTRY PLAYERS

The expo provided a platform to observe and analyze the strategies of key players within the Indian automotive market, highlighting their approaches to the evolving mobility landscape.

➤ *Tata Motors*

Dominant in India's EV market, Tata Motors displayed vehicles across price segments, cementing its position as the EV leader. Its partnership with Tata Power on charging networks reinforces a vertically integrated ecosystem, aiming to provide comprehensive solutions from vehicle sales to charging infrastructure. The company's aggressive portfolio expansion demonstrates a clear commitment to accelerating EV adoption across passenger and commercial segments.

➤ *Mahindra Electric*

Focused on SUVs and three-wheelers, Mahindra highlighted India's potential to electrify commercial and rural segments. Their emphasis on electric three-wheelers, which are crucial for last-mile connectivity and logistics in India, showcases a pragmatic approach to electrification. The company's robust SUV lineup also positions it strongly in a highly sought-after consumer segment.

➤ *Maruti Suzuki*

As India's largest automaker, Maruti Suzuki's strategy was notable for its emphasis on flex-fuel and hybrid technologies. This represents a pragmatic bridge, balancing consumer affordability with gradual decarbonization. While slower to fully embrace battery electric vehicles compared to some competitors, their approach caters to a broad market segment that might be hesitant about immediate full EV transition due to cost or infrastructure concerns.

➤ *Hyundai & Global Firms*

Global players like Hyundai demonstrated their commitment to the Indian market by showcasing EV lines specifically adapted for Indian roads, climate, and cost sensitivity. This signals strong international confidence in India's growing EV potential and highlights the increasing competition and innovation being brought by global entrants. Their presence underscores the global nature of the mobility revolution and India's significant role within it.

VI. GLOBAL COMPARATIVE PERSPECTIVES

A comparative lens highlights India's opportunities and gaps in the global mobility landscape. While India is making significant strides, understanding its position relative to other leading nations provides crucial context.

➤ *China*

China significantly outpaces India in absolute EV penetration and sales numbers. This dominance is driven by aggressive government subsidies, its established leadership in battery manufacturing, and extensive charging infrastructure deployment. However, India holds a distinct edge in cost innovation, often developing more affordable solutions tailored to emerging markets, which China, despite its scale, may not always match for specific price points.

➤ *Europe*

The European Union leads in the implementation of stringent green policies and carbon neutrality targets, pushing automakers towards advanced emission norms, circular economy models, and a rapid transition to EVs and hydrogen. While Europe's policy environment is more mature, India excels in developing consumer-centric affordability models, making green mobility more accessible to a wider demographic through innovative financing and localized solutions.

➤ *United States*

The United States is advancing significantly in areas like autonomous mobility and invests heavily in domestic supply chains for batteries and rare earths through initiatives like the Inflation Reduction Act.

In contrast, India leverages its robust IT sector to strengthen software-driven vehicles, focusing on AI-enabled systems, connected car technologies, and predictive analytics that enhance vehicle intelligence and user experience. This represents a different, yet equally impactful, pathway to technological leadership in mobility.

This comparative analysis demonstrates that while India may have areas to develop, its unique strengths in cost-effective innovation, consumer-centric solutions, and IT-driven automotive intelligence position it as a significant and distinct player in the global mobility transformation.

Table 1 Global Mobility Landscape: A Comparative Overview

Country/Region	Primary Focus	Key Policies/Drivers	Competitive Edge / Challenge
China	EV Revolution	Aggressive subsidies, battery manufacturing dominance	Unmatched scale and manufacturing leadership.
European Union	Carbon Neutrality	Strict emission norms, circular economy models	Mature policy framework and strong sustainability push.
United States	Autonomous Mobility	Inflation Reduction Act, domestic supply chain support	Advancement in autonomous systems; high investment.
India	Sustainable & Smart Mobility	FAME-II, PLI Scheme, National Mobility Mission	Cost innovation, consumer-centric affordability, and IT integration.

- Note: This table is a qualitative summary based on trends and policies discussed in the research paper's literature review and findings.

Table 2 Key Presenters and their Focus Areas at Bharat Mobility Global Expo 2025

Company / Brand	Primary Mobility Focus at Expo	Key Highlights / Strategy
Tata Motors	Electric Vehicles (EVs) across segments	Unveiled complete EV portfolios, integrated ecosystem with charging networks.
Mahindra Electric	Electric SUVs and Three-Wheelers	Emphasis on commercial and rural electrification, robust EV SUV lineup.
Maruti Suzuki	Flex-Fuel & Hybrid Technologies	Pragmatic bridge towards decarbonization, balancing affordability.
Hyundai	Global EV Line for Indian Market	Adapted global EV models for Indian conditions (roads, climate, cost).
BMW Motorrad Group	Performance Engineering / Automotive Dynamics	Offered professional drift experience (as per personal learning).
Other Global Firms	Diverse EV & Tech Solutions	Signaled confidence in Indian market, bringing adapted global technologies.
Indian Startups	Digital Innovations, AI, Battery Management	Showcased predictive battery management, AI-enabled systems.

- Note: This table is a summary of the key presenters and their focus areas as mentioned in the field study and does not represent an exhaustive list of all participants at the expo.

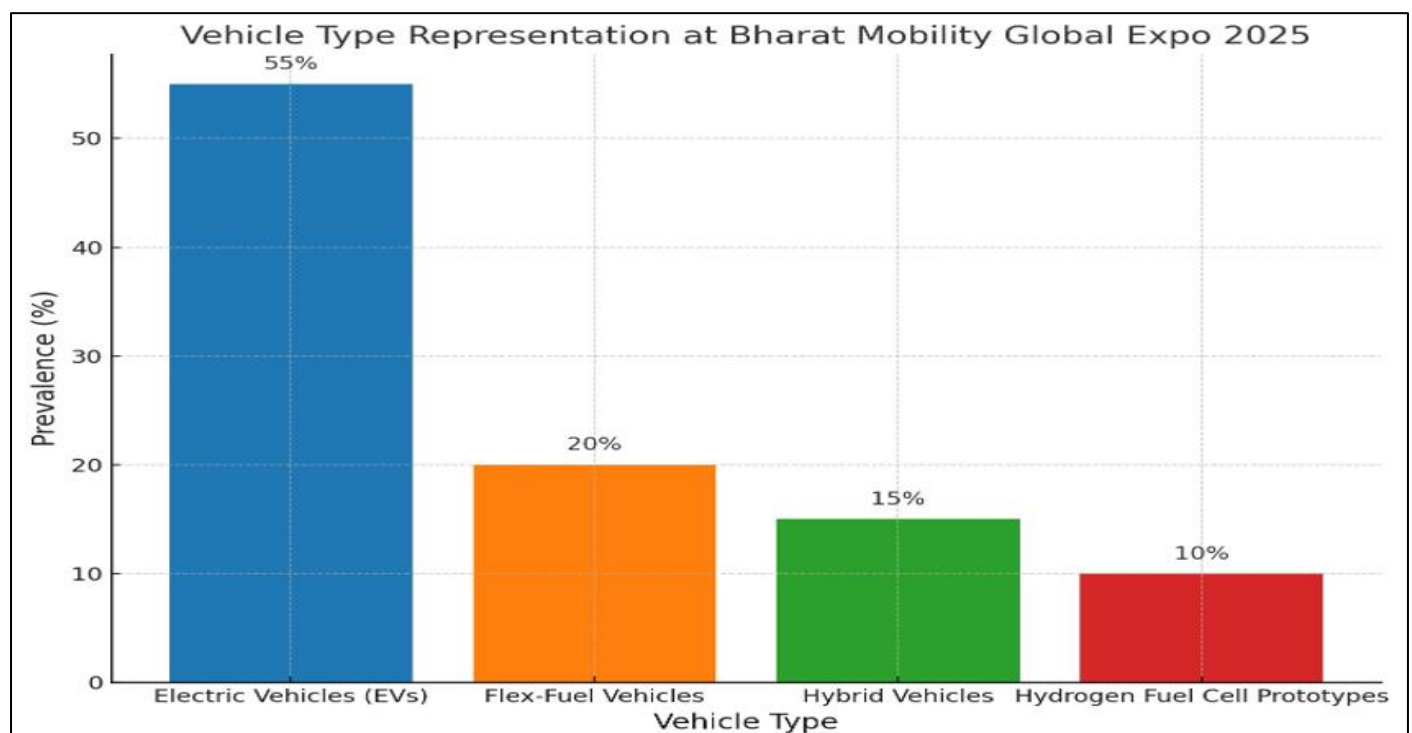


Fig 1 Vehicle Type Representation at Bharat Mobility Global Expo 2025.

This figure visually represents the dominance of electric and alternative fuel vehicles at the expo, reflecting a clear industry shift towards cleaner mobility

VII. POLICY IMPLICATIONS AND ROADMAP

The findings from the Bharat Mobility Global Expo 2025 underscore the critical role of policy in shaping India's automotive future. The government's strategic initiatives and industry's response highlight a clear roadmap for achieving sustainable mobility goals.

➤ *Policy Landscape*

- **FAME-II (Faster Adoption and Manufacturing of Electric Vehicles):** This policy serves as the primary driver for EV adoption, offering subsidies for both vehicles and charging infrastructure. The expo showed how this policy has catalyzed the market, with manufacturers aligning their product strategies to meet FAME-II guidelines.
- **PLI (Production Linked Incentive) Scheme:** The PLI scheme for the automotive sector incentivizes advanced automotive technologies and components, encouraging domestic manufacturing and reducing reliance on imports. This was visible at the expo through the focus on localization and domestic supply chain development.
- **National Mobility Mission 2040:** The expo's discourse and the long-term strategies of major players indicate alignment with this mission, which outlines a long-term strategy for clean and connected mobility.

➤ *Recommendations:*

Based on the field study and market analysis, the following recommendations are crucial for accelerating India's mobility revolution:

- **Expand Charging Infrastructure:** Public-private partnerships should be aggressively pursued to expand the charging network beyond metro cities, addressing the "range anxiety" of potential EV buyers.
- **Lower Entry Costs:** Innovative financing models, such as battery leasing and favorable loan schemes, are needed to make EVs more accessible and to lower the high upfront cost.
- **Encourage Rural Adoption:** Policies should be tailored to incentivize commercial EVs and two-wheelers in rural and semi-urban areas, which are critical for last-mile connectivity and local commerce.
- **Strengthen R&D:** Increased investment in research and development for battery chemistry, hydrogen technologies, and sustainable vehicle materials is essential to maintain India's competitive edge in the long run.

VIII. PERSONAL EXPERIENCES AND LEARNINGS

The Bharat Mobility Global Expo 2025 was not just an academic exercise but a deeply personal and insightful

journey. My experiences across the three dedicated days provided me with a unique perspective on the intricate relationship between policy, industry, and consumer perception.

- **Day 1 (Launch Day):** Witnessing the inaugural sessions and major product unveilings highlighted the symbiotic relationship between government vision and market innovation. The speeches by officials and CEOs demonstrated how strategic statecraft and industry ambition converge to create a national-level transformation.
- **Day 3 (Industry Day):** Conversations with engineers and professionals were particularly enlightening. These interactions revealed the tangible technical bottlenecks, such as battery logistics and charging infrastructure challenges, making the abstract policy discussions from Day 1 feel more concrete and grounded in reality.
- **Day 5 (Public Day):** My interactions with the public, including students, young professionals, and families, illustrated a profound cultural shift. The car is no longer just a machine; it is a lifestyle statement that increasingly factors in connectivity, efficiency, and environmental consciousness. This day emphasized how public curiosity and evolving aspirations are a powerful force driving the market.
- **A Personal Reflection:** The professional drift ride in a BMW M4 Competition was a standout experience. Beyond the thrill, it offered a firsthand understanding of performance engineering, vehicle dynamics, and the sophisticated control systems that define modern automobiles. It was a tangible reminder that at the heart of the mobility revolution is a blend of technological precision and the human desire for a superior driving experience.

These experiences solidified my conviction that India's mobility revolution is a multi-faceted phenomenon—a delicate balance of technological progress, policy-driven direction, and shifting societal values.

IX. CONCLUSION

The Bharat Mobility Global Expo 2025 demonstrated that India is not merely a passive observer of global mobility trends but is actively shaping them. With its unique blend of policy ambition, domestic industrial strength, and an innovation-driven IT ecosystem, India holds the potential to lead the Global South in mobility transformation.

The expo made it clear that while significant progress has been made, realizing this potential demands addressing systemic gaps—namely, infrastructure, affordability, and equitable adoption. The revolution will not be defined by technology alone but by the synergy of supportive policy, market forces, and consumer trust.

For me, as a researcher and student, this experience was deeply inspiring. It reaffirmed that the future of mobility is not just about the vehicles we drive, but about our collective vision for a sustainable, inclusive, and technologically

empowered India.

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