Smart Transportation EV and Shared Mobility

Introduction

A revolutionary change is currently taking place in the global automotive sector as it attempts to shift to alternative, less energy-intensive choices. The term "smart mobility" describes effective transportation between destinations that considers the environment, cost, and time. It is a new and groundbreaking way of thinking about transportation that is cleaner, safer, and more effective. Smart mobility has grown rapidly over the last several decades and will continue to do so. If the current public transportation system is compared with that from a few decades ago, improvements can be seen in areas like real-time schedules, route optimization, digital tracking, cashless travel, etc. The list of developments using artificial intelligence (AI) that will signal turning points in the field of smart mobility now includes the future of flying cars and public transit.

India is beginning a new era in the history of technology as it rises to the top of the list of the world's most desirable investment locations. One of the most noticeable changes in India's many industries has been the adoption of smart technology.

Transportation is an important use case for smart cities since it significantly affects metropolitan regions. In India, the transport industry uses 18% of the country's total energy. This amounts to around 94 million tons of energy (MTOE) equivalent.

It is important to introduce alternative transportation methods that can be combined with India's rapid economic growth, rising urbanisation, travel demand, and nation's energy security, while keeping in mind the climate change commitments made by the Government of India during the COP21 Summit held in Paris to reduce emission intensity by 33–35% by 2030 from 2005 levels.

Electric mobility presents a viable alternative to solving these challenges when combined with innovative pricing methods, the proper technology, and support infrastructure, and as a result, it has been on the radar of Government of India.

The transportation industry is currently evolving as a result of efforts to digitize the transportation system as part of the country's "Smart Cities" mission. The use of intelligent transportation technologies is becoming more and more common across the globe as researchers find inventive ways to reduce traffic congestion and improve urban mobility.

Realizing this goal requires addressing difficulties that are becoming more prevalent globally, such as rising carbon emissions that cause rapid climate change, population growth that causes traffic congestion, rising fuel prices, etc. As a result, the Government of India is aggressively concentrating its energy towards speeding "Smart Mobility" in India, which is in line with the goal of creating smart cities.

EV market in India

With the possibility of 100% FDI, new manufacturing centers, and intensified efforts to improve charging infrastructure, the electric car industry in India is gaining momentum. Other growth factors for the Indian EV market include federal subsidies, regulation that favours higher discounts for electric two-wheelers built in India, as well as an increase in localised ACC battery storage production. Additionally, the Cabinet approved a production-linked incentive programme for the automobile industry in September 2021 to promote the development of electric and hydrogen fuel cell vehicles. In 2021, India reported selling over 300,000 EVs.

The electric vehicle market in India is driven by a wide range of factors.

- EV batteries are one of the most expensive components. It is projected that EV battery costs would decrease, bringing down the price of EVs.
- Strict emission regulations for the automotive sector.
- The promotion of electric vehicle sales through policies and initiatives of the government.

Market size

According to Market Research Future (MRFR) 2022, by the end of this decade, the market for advanced transportation facilities is expected to grow by a staggering USD 320 billion. The government is leaning toward cutting-edge technological tools including the Internet of Things (IoT), AI, 5G internet connectivity, cloud engineering, and similar ones as work on smart city projects advances.

In the months of April through September 2022, India reported sales of 277,910 electric two-wheelers, a 404 percent increase over the same time the previous year when 55,147 units were sold. 18,142 electric automobiles were sold in H1 FY 2022–23, indicating a 268 percent increase.

By 2030, the Indian automobile market is anticipated to rank third in terms of volume. Reliance on the traditional forms of fuel-intensive mobility will not be viable given the size of the domestic market. Federal authorities are creating a mobility alternative that is "Shared, Connected, and Electric" in an effort to address this, and they have set an ambitious goal of attaining 100% electrification by 2030.

According to an independent assessment by CEEW Centre for Energy Finance (CEEW-CEF), If India continues to make steady progress toward achieving its ambitious 2030 objective, the EV market in India will provide a US$206 billion potential by 2030. This would necessitate an overall investment in vehicle manufacturing and charging infrastructure of approximately US$180 billion. The Indian EV market achieved $6 billion in investment in 2021 and is progressively growing in appeal to investors in venture capital and private equity.

Following the adoption of the FAME India scheme, the EV market in India has experienced substantial growth. According to a report by the India Energy Storage Alliance (IESA), the Indian EV market will expand at a CAGR of 36% until 2026. The allocation is under the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (or FAME II). The market for EV batteries is also anticipated to expand at a CAGR of 30% over the same time frame. The total number of chargers sold is expected to increase by up to 50,000 units at a CAGR of 60% till 2026.

In the meanwhile, the IESA analysis projects that the Indian EV market will expand at a CAGR of 49 percent from 2022 to 2030 under a "business as usual" scenario. Overall, the EV sector is expected to generate 50 million indirect jobs and 10 million direct jobs by 2030 (IVCA-EY-Induslaw report). Niti Aayog anticipates that by 2030, the substantial EV financing industry in India will be valued US$50 billion.

All of this, however, is dependent on necessary elements like building a reliable infrastructure for charging devices and lowering India's excessive reliance on battery imports. When the rechargeable batteries are domestically produced, and the capacity for electricity production and storage is increased, both these challenges can be addressed. 97% of the electric two-wheelers sold in the previous fiscal year were electric scooters, with the remaining 3% consisting of a very tiny number of motorcycles and electric cycles. 90% of all electric two-wheelers sold were low-speed scooters, which have a top speed of 25 km/h and are exempt from registration with the transportation authorities.

Government policies & Schemes

At the COP26 Summit in Glasgow, India launched the website e-AMRIT (https://www.e-amrit.niti.gov.in/), which will serve as a one-stop resource for all information on electric vehicles. It discusses important issues with the adoption of EVs and their purchase, including the locations of charging stations and EV financing choices, as well as details on investment opportunities, governmental regulations, and manufacturer and driver incentives.

Since more than 13 states have announced their electrical vehicle regulations as of today, the EV business in India has recently been recognized to be growing.

Chief State-wise EV policies and subsidies

MAHARASHTRA

- The state government of Maharashtra has rolled out a Rs 930 crore policy that is effective until March 31, 2025, and has announced EVs will be exempt from road tax and registration fees.
- The goal is to make Maharashtra the "topmost producer of battery-powered electric vehicles in India" (based on annual production capacity) and to have three lakh electric vehicles registered in the state by 2025.
- Maharashtra will have the lowest cost EVs in the country due to the state's government's pledge to offer an incentive of Rs 5000/kWh for all EV categories.

GUJARAT

- Gujarat claims to have the highest subsidy, at Rs 10,000 per kWh. The maximum subsidies available for electric two-wheelers are Rs 20,000, electric three-wheelers are Rs 50,000, and the maximum subsidies available for electric automobiles are Rs 1.5 lakh.
- The state has also announced a few hundred-rupee registration fee exemption, but has not canceled road tax.

DELHI

- For electric two-wheelers, the Delhi policy scheme offers a subsidy of Rs 5000 per kWh up to a maximum of Rs 30000.
- Electric three-wheelers are eligible for a subsidy of up to Rs 30000, and electric automobiles are eligible for a discount of up to Rs 1.5 lakh.
- The Delhi government provides cash incentives for electric vehicles in the range of Rs 5000–7000, as well as exemptions from road tax and registration fees.

RAJASTHAN

- According to a notice released by the Rajasthan Transport Department, EV users would receive a refund for the State Goods and Service Tax amount.
- Additional incentives are given for purchasing electric two- and three-wheelers.

KARNATAKA

- The cabinet decided to offer investors in the EV sector a 15% capital subsidy on the value of fixed assets over five equal annual payments. The maximum amount of land eligible for this incentive is 50 acres.
- 1,000 electric buses added to local public transportation bus fleets.

TELANGANA

- The state waives the registration and road tax requirements for all electric vehicles.
- Offer some significant supply-side incentives, such as a capital investment subsidy of up to Rs 30 crore, an annual SGST refund of up to Rs 5 crore, a reduction in electricity rates of up to Rs 5 crore, and an interest subsidy of up to Rs 5 crore.

ANDHRA PRADESH

- By 2024, there should be one million EVs.
- By 2024, there should be 100,000 slow and fast EV charging stations.
- The government intends to prohibit new gasoline and diesel vehicle registrations.

UTTAR PRADESH

- Releasing a total of 1 million EVs by 2024, across all market sectors.
- By 2030, the state intends to have deployed 1,000 electric buses.
- By 2030, it is intended to electrify public transportation by 70%
- Designated green routes in 10 chosen EV cities.

MADHYA PRADESH

- Quick EV adoption and contribution to 25% of all new public transport vehicle registrations by 2026.
- New Internal Combustion Engine (ICE) vehicles won't be registered in several cities.
- Incentives for electric autorickshaws and shared e-rickshaws: Free cost of permits
- 5 years of road tax/vehicle registration reimbursement, and a complete waiver of parking fees

TAMIL NADU

- 5% of buses to be electrified annually by 2030, and shared mobility fleets should be converted.
- By 2030, institutional vehicles, e-commerce delivery vehicles, and logistics vehicles will all be EVs.
- Within ten years, replace all auto-rickshaws in six important cities with electric vehicles
- Receive 100% exemption on electricity tax till 2025.

KERALA

- By 2022, a million electric vehicles are anticipated in the state, and by 2025, 600 electric buses will be used for public transportation.
- Money to close the viability gap for government fleet and e-buses.
- Tax breaks, toll fee exemptions, road tax exemptions, free fleet driver permits, and free parking incentives for EVs

Major private players in the EV & Shared Mobility industry

India is going through a paradigm transition in the automobile industry, just like the rest of the world. The burden of oil imports, rising pollution, the Russia-Ukraine war spiking price inflation, as well as international pledges to tackle global climate change, are key drivers of India's efforts to speed up the transition to e-mobility on the one hand and expanding consumer demand on the other.

Top EV vehicle companies in India

Top Market Players in India's EV 2-Wheeler Segment – October 2022 Sales

Company name	Units sold
Ola Electric	16,178
Okinawa Au	14,924
Ampere Vehicles	10,053
Hero Electric	8,861
Ather Energy	7,306

Source: e-vehicleinfo.com

Courtesy: Electric Vehicle Industry in India: Investment Outlook and Market Profile (india-briefing.com)

Top Market Players in India's EV 3-Wheeler Segment – October 2022 Sales

Company name	Units sold
YC Electric Vehicle (YATRI)	3151
Mahindra Electric	2953
Saera Electric Auto Pvt Ltd (MAYURI)	1904
Dilli Electric Auto Pvt Ltd (CITYLIFE)	1521

Company name	Units sold
Champion Poly Plast	1295

Source: e-vehicleinfo.com

Courtesy: Electric Vehicle Industry in India: Investment Outlook and Market Profile (india-briefing.com)

Top players in India's car market: Tata Motors, MG Motor India, Hyundai motors Ltd, and BYD India.

India's Electric Car Sales – April to September 2022 (H1 FY 2022-23)							
Electric car manufacturer	**April**	**May**	**June**	**July**	**August**	**September**	**Total**
Tata Motors	1812	2495	2724	2891	2765	2831	15,518
MG Motor India	245	247	235	268	316	280	1591
Hyundai Motor India	23	27	51	61	73	74	309
BYD India	21	42	49	44	45	63	264
Mahindra & Mahindra	13	9	19	26	17	112	196
BMW India	17	9	5	5	25	27	88
Audi	8	8	14	8	14	10	62
Porsche	4	5	4	7	7	13	40
Mercedes-Benz	11	5	3	2	4	7	32
Jaguar Land Rover India	3	7				1	11
Others	4	1	7	17	1	1	31
Total	2161	2855	3111	3329	3267	3419	18,142

Source: Autocarpro.in

Courtesy: Electric Vehicle Industry in India: Investment Outlook and Market Profile (india-briefing.com)

Top shared-mobility companies in India

- **Ola**

  Ola, one of the most popular transportation app in India, with shared mobility solutions are significantly lowering vehicle pollution and cutting traffic congestion in Indian cities. The first social ride-sharing network in India, Ola Share, has helped

keep about 1.4 million vehicles off road since its introduction in February 2016, according to the statistics compiled by the company.

- **Uber**

  Uber is a global brand and one of the top shared mobility companies in India. Even though the business is situated in San Francisco, it has garnered international attention. It offers ride-hailing, food delivery (via Postmates and Uber Eats), package delivery, courier services, freight transportation as well as the rental of electric bicycles and motorized scooters

- **Blablacar**

  A leader in transportation on a global scale, BlaBlaCar is a European company for carpooling. BlaBlaCar aims to make long-distance travel more accessible, in contrast to the majority of carpool and ridesharing apps, which are meant to match you with passengers or drivers going to nearby locations. It connects drivers and passengers who are prepared to travel together between cities and split the cost of the trip via its website and mobile apps. The business acts as a broker and earns a commission from each booking; it does not own any vehicles.

- **BluSmart Mobility**

  Located in Gurugram, India, BluSmart Mobility is a ride-sharing company. It is referred to as India's first shared all-electric smart mobility platform for effective, economical, intelligent, and sustainable transportation. It is a leading provider of shared mobility companies in India.

- **Meru Mobility**

  A unit of MLL Mobility Private Limited, Meru is a leading name in shared mobility in India. The idea of "tech-enabled, ride-hailing" was pioneered in India by Meru. And after serving millions of customers for more than 20 years, it is regarded as the most dependable taxi company. Meru offers its services in 24 cities in India with budget-friendly hatchbacks, sedans, and MUVs to luxurious sedans, SUVs, and electric cars. Meru has gradually evolved into a one-stop solution for numerous travel requirements, ranging from city rides to business travel and airport transfers.

- **Zoomcar**

  Businesses all across the world can use linked technology options and shared mobility solutions from Zoomcar Mobility Services. It is currently the industry leader in the ecosystem for car sharing, hosting approximately 7,000 vehicles on its platform and operating in five different nations. Users can rent automobiles from Zoomcar for an hour, a day, a week, or a month. Zoomcar, which has its headquarters in Bangalore, employs approximately 300 individuals and does operations in more than 50 Indian cities.

India-Taiwan cooperation on EV and Shared Mobility

Taiwanese firm, Gogoro Inc., sees enormous potential for its battery-swapping technology in India in the quest to capture a slice of the electric car market, which is predicted to grow 400 times larger by the end of the decade.

In collaboration with India-based Zypp Electric, a company that operates an EV-as-a-service platform for last-mile delivery, Gogoro has announced plans to launch a trial project. In December 2022, Gogoro and Zypp Electric will launch this pilot project in Delhi. Zypp Electric will deploy Gogoro electric scooters as part of the initiative to carry out its B2B last-mile delivery activities. A 1.6kWh Gogoro Smart Battery that can be changed at a Gogoro Network GoStation will power the electric scooter.

In addition, Gogoro supplies its own brand of electric scooters to partners who manufacture vehicles, including Hero, Yamaha, Aeonmotor, PGO, eReady, and eMOVING.

At present Gogoro has partnered with Foxconn in India on multiple projects including smart batteries, vehicle engineering and manufacturing. Gogoro will concentrate on its own product design, technological development, marketing and branding, increased distribution, and customer service channels by integrating Foxconn's strong production, worldwide capabilities, and top quality.

Likewise, Taiwanese EV manufacturer Ahamani EV Tech launched a joint venture with Gujarat-based battery manufacturer Renon India to create battery packs for the Indian automobile industry. This collaboration seeks to supply domestic automakers with dependable and cutting-edge battery packs with a higher lifecycle as the EV market grows to suit the changing consumer expectations and to solve challenges with energy and climate change. Various battery-related issues, including cost, energy density, lifecycle, charging time, and safety, will also be addressed by the joint venture. It will also aim to develop efficient recycling structures and a reliable supply capacity.

Major Exhibitions and Events on EV & Shared Mobility in India.

Electric vehicle events and expos in India offer the opportunity to explore the most recent technological advancements and network with EV consumers, manufacturers, startups, and enthusiasts. These events offer a platform for connecting with national and worldwide EV sector enterprises while learning, promoting, and networking.

- **EV India Expo**

  With the main goals of discovering new business opportunities and environmental protection, the EV India Expo is an International Electric Motor Vehicle Show that will give electric vehicle manufacturers the chance to showcase their most recent products, technology, and equipment, Smart and NextGen transportation, electric passenger cars, scooters, motorcycles, cycles, and buses, among other types of vehicles.

- **India eMobility Show**

  The India eMobility Show will offer a great social space for regional and international EV companies to connect and explore business prospects in a highly engaging business environment. The event seeks to bring together important players from every stage of the domestic and global mobility value chain under one roof to share vital business insights and have high-level discussions on how to accelerate India's EV transition and accomplish zero-emission transportation. The India eMobility Show 2023, which will be held at The India Expo Centre & Mart from March 23 to 24.

- **India International EV Show**

  India International EV Show (IIEV Show) is the largest EV industry gathering in India which also highlights the enormous opportunities and potential difficulties associated with EV growth in India. Engineers, mechanics, scientists, and decision-makers collaborate on this common platform to find solutions for issues affecting the advanced battery and electric car industries. This program takes advantage of the most recent EV trends and features cutting-edge discussions with leading experts and business visionaries on hot issues like battery technology, energy storage options, and expanding charging infrastructure.

- **Auto EV India**

  Auto EV India is slated to be one of the world’s chief EV Auto and technology shows. A ground-breaking event that brings together the brightest minds to present on a single platform to highlight the best that the automotive industry has to offer in terms of products, technology, concepts, and trends. The Auto EV India 2022 trade show brings together the whole EV value chain under one roof in order to network with important industry players and discover a wide range of business prospects in a highly competitive EV market.

- **E-charge Forum**

  E-charge forum is an international Summit on Electric Vehicle Charging Technology & Infrastructure Development.

- **The India Electric Vehicle Trade Show**

  The Conference provides essential industry knowledge on topics such as new technologies that can impact energy efficiency, carbon reduction plans, future cities, developing infrastructure for electric vehicles, renewable energy sources for charging electric vehicles, and financing plans for organizations paving the way for a less polluted tomorrow.

Conclusion

Future mobility in India has enormous potential. Demand for urban transportation will only increase as the nation's overall population rises and urban migration intensifies. India is positioned to lead the world in the transition to a decarbonized and sustainable transportation future because of a combination of a young population, technological developments, and wise governance, despite facing huge and complicated mobility difficulties.

Recent regulatory changes in India are putting the nation in a position to take advantage of the size of its market and attract EV investment from around the world. Experts and investors who have been consulted predict that India would achieve this by first supplying the home market with EVs and EV non-battery components and then, within three to five years, making progress in battery assembly at the initiative of investors and enterprises.