Disruptive dimensions of mobility in India's new "green age"

Harnessing step change towards sustainable transportation

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1.Tracking Mobility Transformation in India

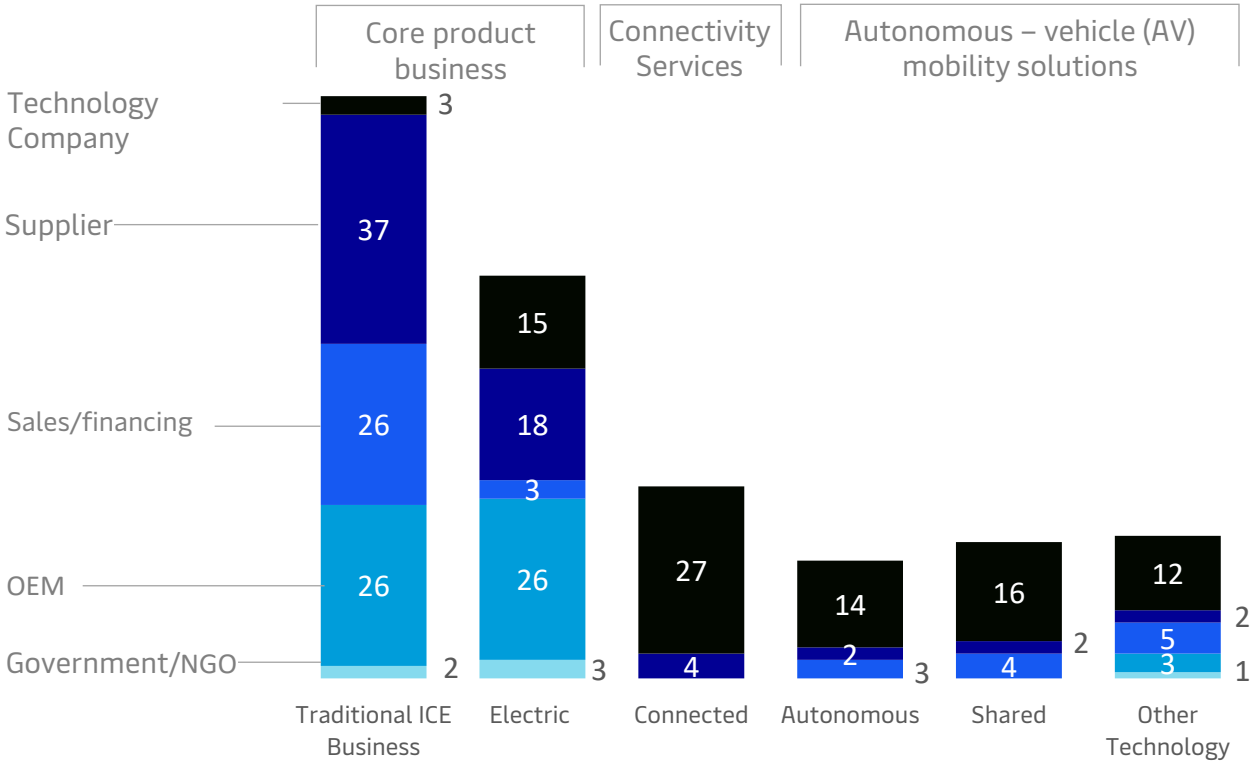
Global future mobility ecosystem

Globally, the mobility ecosystem is undergoing a transformational, technological and economic shift which is fundamentally changing the way people and goods are being moved. The automotive sector coupled with transport are experiencing heavy disruptions, with new markets originating, the existing ones showing converging dynamics and others witnessing a declining trend which shall end up into vanishing existence. Many new age start-ups and new market entrants are challenging the incumbents who are focused on leveraging their experience and develop a sustainable market model. The mobility transformation is majorly driven by three main trends:

- Electrification of vehicles and availability of alternative power trains
- Connected and autonomous vehicles
- Mobility-as-a-Service (MaaS)

Significant investments have been routed globally among the above listed trends, wherein each have great potential to disrupt the entire mobility ecosystem. Coupled with advent of greener alternatives as fuel like hydrogen cells and bio-fuels, the current vehicle ecosystem shall radically become more efficient, data enabled and sustainable. As the ecosystem for mobility would keep evolving its anticipated market size is expected to tip a whopping $1 Trillion by 2030.

Exhibit 1: Total new OEM partnerships since 2014 till 2022 by organization type, number

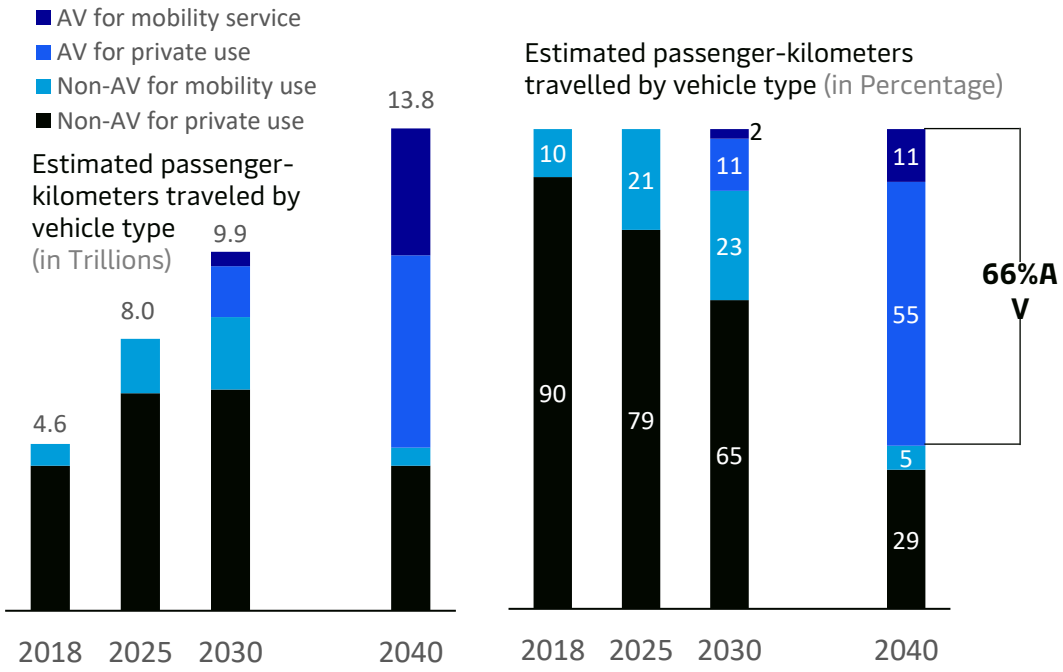


Source: eninrac research & analysis, McKinsey

Autonomous – vehicles (AV) likely to take front seat by 2040 globally!

China is expected to lead the global markets for AVs and has the potential to be the largest one by 2040. It is likely that the share of AVs will contribute approximately 70% of the passenger-kilometers travelled in 2040 which can attract a revenue of $1.1 trillion from mobility services and $0.9 trillion from sales of autonomous vehicles by that year. To understand that in terms of number of vehicles will make up just over 40% of the new vehicle sales in 2040, and nearly 12% of vehicle installed base.

Exhibit 2: AVs to contribute 40% of new vehicle and nearly 12% vehicle installed base



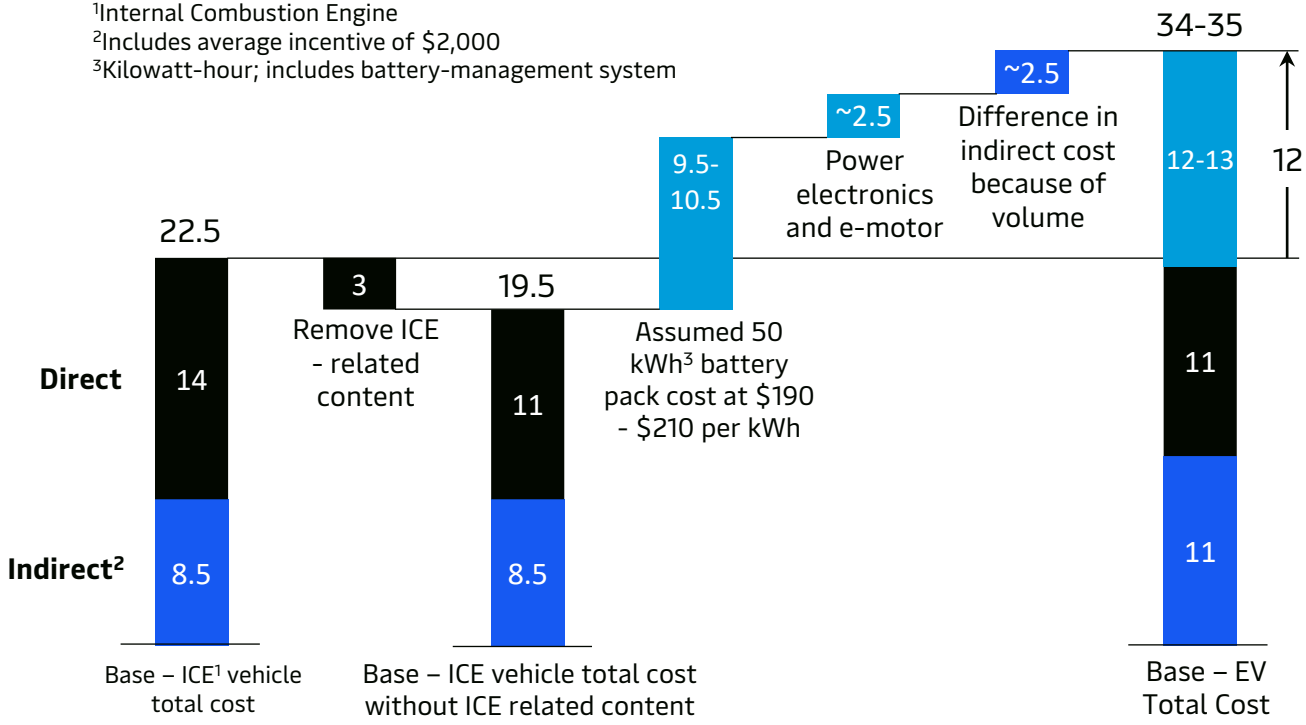
Source: eninrac research & analysis, McKinsey

Challenge to transform EVs to profitability remains to be tamed

The challenge to make EVs profitable remains to be addressed globally. Although, OEMs along the globe are working hard to bring the cost gap of EVs and ICE down but it will take some time to reach at par. **Currently a gap of nearly $ 12000 exists between EVs and ICE** which is massive for country like India. Battery pack remains the biggest cost driver for EVs around the globe for which the OEMs are focused upon native EV design and cooperation among each other to bring down the costs. There is an ardent need to scale up battery manufacturing so that EVs could become a sustainable option in long run.

Exhibit 3: Cost-Walk of ICE[1] & EV C-Car (Estimated average per vehicle, $'000)

[1]Internal Combustion Engine
[2]Includes average incentive of $2,000
[3]Kilowatt-hour; includes battery-management system

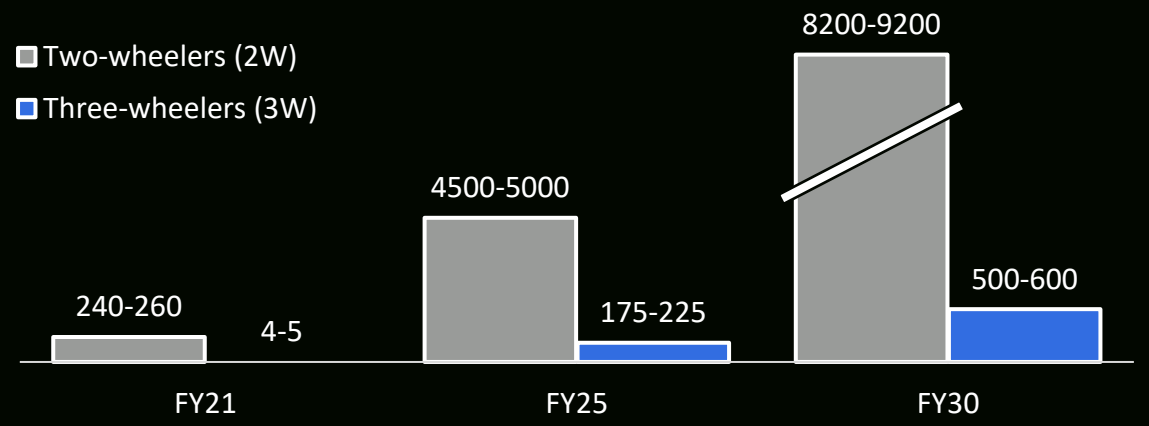


Source: eninrac research & analysis, UBS & McKinsey

Demand for 2W & 3W e-mobility will lead India's surge for electric vehicles by 2030

The demand for small format e-vehicles in India is witnessing a north-bound trend and is likely to drive the EV ecosystem in the country. It is estimated that by 2030 the 2W & 3W fleet size could reach or cross 9 Million on cumulative basis. Further the push for augmenting the infrastructure to help lead the EVs penetration is quintessential in the country.

Exhibit 4: Estimated demand of electric 2W and 3W in India ('000 units Base Case)



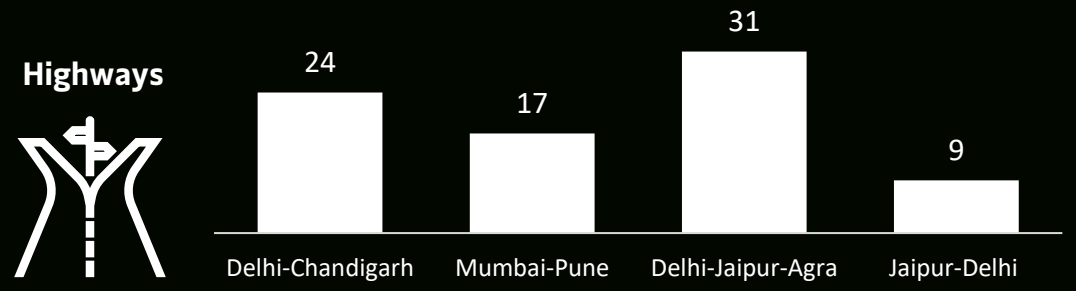
Percent total sales that are of EVs		FY21	FY25	FY30
	2Ws		25-30%	35-40%
	3Ws		25-30%	60-65%

Source: eninrac research & analysis, UBS & McKinsey

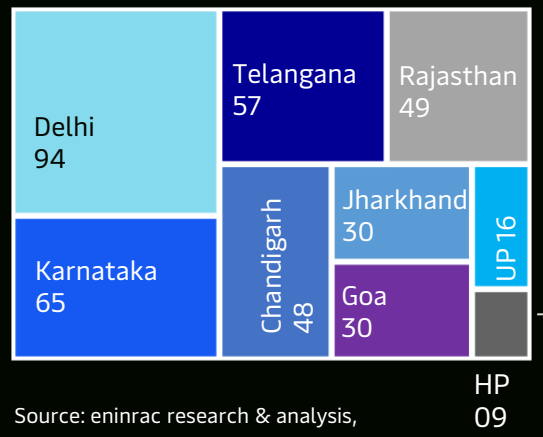
EV charging stations & chargers will need adequate push to enable sustainable growth electric mobility in India

The EV charging stations sanctioned by Ministry of Heavy Industries, GOI stands at 520 of which 479 have been installed till July 2022. The spread of 479 involves 398 installed in different states and 81 charging stations on highways as indicated in Exhibit 5.

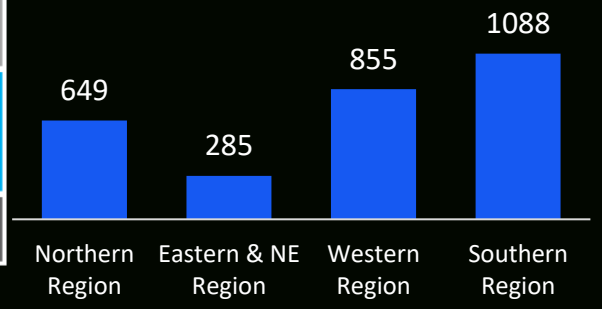
Exhibit 5: EV Charging stations installed under FAMEI on highways in India as of July 2022 & Region wise EV Charger sanctioned under FAME II



State wise Charging Stations under FAME I



Region wise EV Chargers Sanctioned in India under FAME II (as of July 2022)



Source: eninrac research & analysis,

2.Sustainable Transportation Initiatives in India

India & sustainable mobility – Need of the hour

India is not completely starting from scratch in terms of sustainable transportation initiatives. Both at the concurrent Government levels steps have been taken to bring initial investments in new transportation modes and technologies.

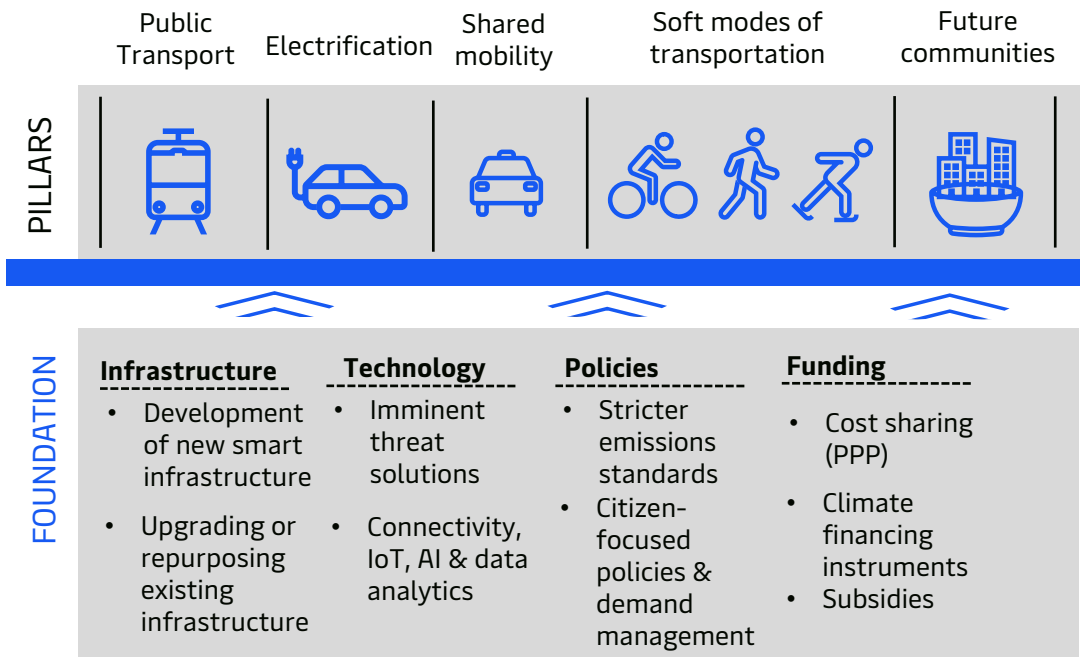
a. **Electric Vehicles:** Electric buses are already plying in various Tier I and Tier II cities in India since last couple of years. Delhi has recently got a dedicated EV bus fleet to meet the demand of local public transport in the region.

b. **Shared Mobility:** Like e-mobility the shared mobility demand for shared mobility is going to rise as well in the country. This shall at large be driven by three use cases like e-commerce/small format, food delivery & grocery delivery. The growth for these use case shall exceed 40%-50% if the penetration of EVs are being supported by supportive ecosystem.

c. **Micromobility:** In the country in cities like Delhi, Bangalore & Ahmedabad are offering e-scooters and docked bicycles. Delhi metro also offers e-bicycles on rentals and has seen shared mobility penetration in the city.

d. **Mass Transit:** There has been significant investment in metro projects and mass rapid transit systems in the country. All major cities are having either the running metro projects or are having them under construction.

Exhibit 6: Framework of action plan on sustainable mobility in India



Source: eninrac research & analysis

The framework for India to adapt a sustainable mobility model will have five major contributing pillars on a foundation of four key elements of infrastructure, technology, policies & funding respectively.

3. Pillars & Key Foundation Elements for Mobility in India

Identified Pillars of Mobility in India

India is a vast country and with growing population the nature of public transport, goods movement and other mobility shall have to adapt accordingly. For this the identified pillars are depicted as below:

a. **Public Transport:** A multi-modal, integrated, and robust public transport system is central to sustainable mobility systems. Governments at concurrent levels should continue to invest in these systems, with the goal of eventually shifting to a fully electric fleet. Advancing public transport ridership has allowed urban areas across the globe to overcome many less-than-efficient mobility and societal outcomes.

b. **Electrification:** GOI has already enabled incentives coupled with State level incentives on offer for greater adoption of EVs. With this intent the country witnessed nearly 0.55 Million of EVs sold within a period extending from January to August 2022 which is anticipated to reach beyond 0.8 Million by December 2022. This shall be leading to almost 65% yoy growth for the same period in 2021.

c. **Shared Mobility:** Cities in India can move commuters more efficiently by reducing the reliance on personal vehicles and using shared mobility solutions to increase riders per vehicle. The market expansion of ride-hailing players like OLA & Uber has proven that shared mobility as a business model works well within a lightly regulated market, while improving asset utilization.

d. **Soft Transport Modes:** Micromobility solutions can increase the options for urban residents and increase usage of public transport by addressing first-mile and last-mile connection challenges. State governments should continue to deploy such alternatives as bike-sharing and e-scooters in major cities apart from Delhi, Mumbai, Bengaluru and Chennai.

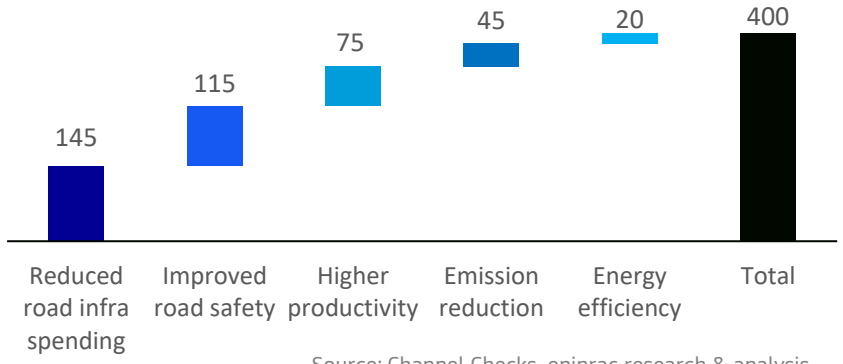
e. **Future Communities:** Governments can reduce the need for transportation through sustainable urban designs that use new living and community concepts to make vital goods and services available within walking distance from residential areas

Key Foundation Elements of Mobility in India

The key elements which are fundamental to have sustainable mobility in the country shall be:

- Adept Infrastructure
- Higher Technology Penetration
- Right Policy Environment
- Oriented Capital Expenditure & Funding

Exhibit 7: Economic value creation potential of sustainable mobility in India in US$ Billion by 2040



Source: Channel Checks, eninrac research & analysis

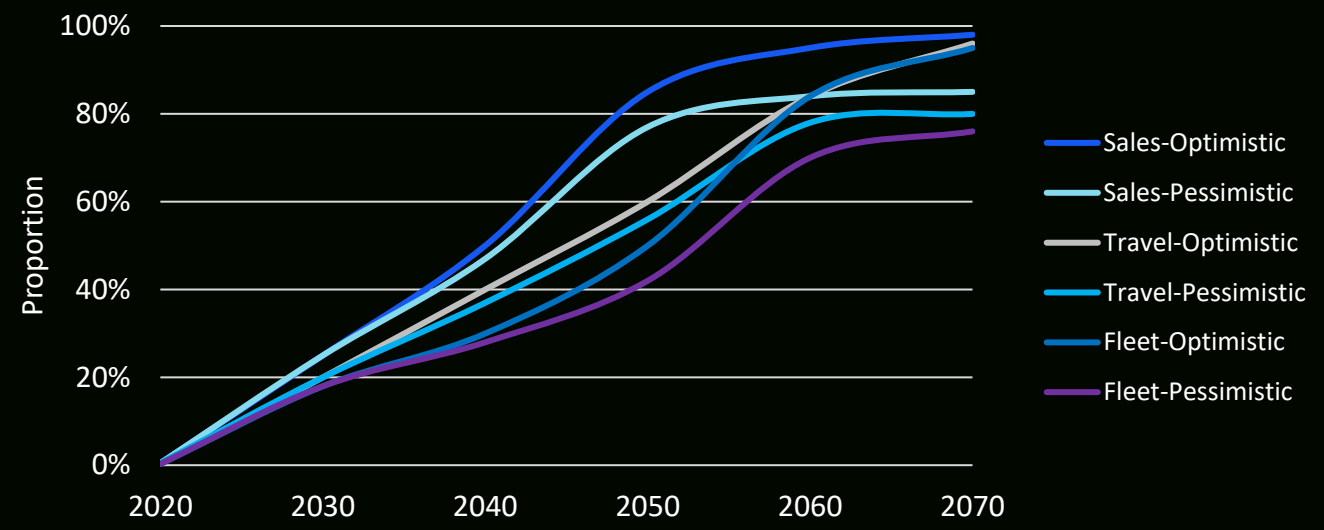
4. Future of Transport

System in India – AV & Vehicle Market Share

Automation Level/Scenarios	Description
Level 0	No Automation
Level 1	Automation of one primary control function, e.g, cruise control, self-parking etc.
Level 2	Partial driving automation. Automation of two or more primary control functions which can work together to relieve the driver of control of those functions
Level 3	Conditional driving automation. The vehicle can control all safety-critical function under certain traffic or environmental conditions
Level 4	High driving automation. Self-driving without human controls, with a well-defined operational design with operational capability even if a human driver doesn't respond
Level 5	Full driving automation. Self-driving. Automation without human controls in all driving environments that can be managed by human driver.

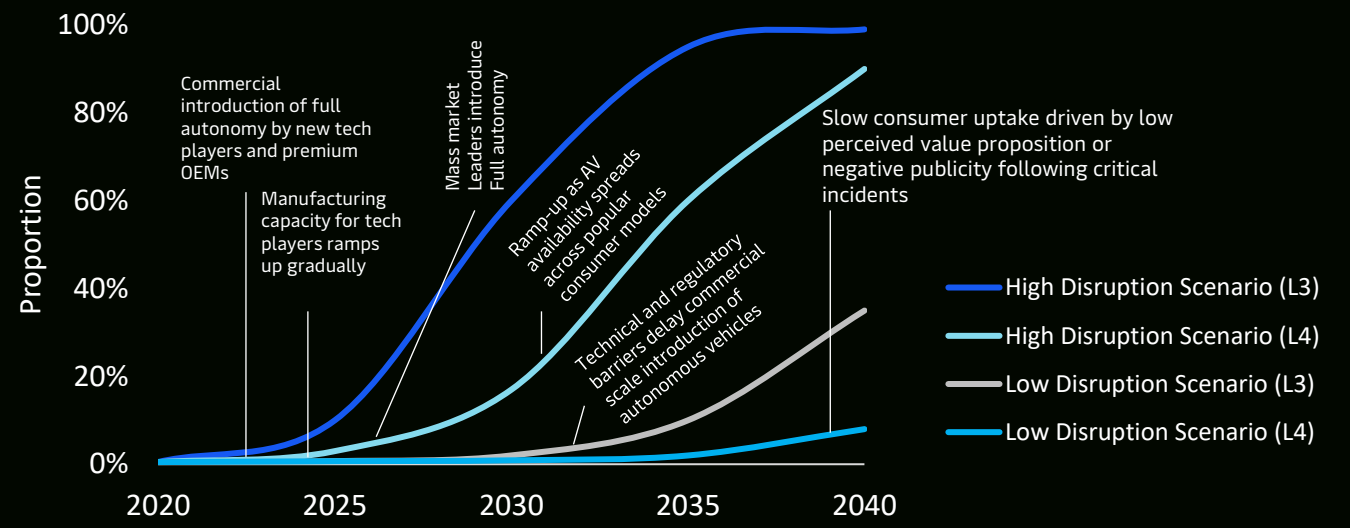
Source: Society of Automotive Engineers, eninrac research

Exhibit 8: Autonomous vehicles sales, fleet & travel projections in India by 2070



Source: eninrac research & analysis, Litman

Exhibit 9: New vehicle market share of self-driving vehicles in India



Source: eninrac research & analysis, McKinsey

5. Way Forward for India's Sustainable Mobility Plan

Looking at the road ahead, India aspires to reach its vision of 100% EVs by 2030. Surely, factors such as increasing government support, decreasing cost of technology, growing interest of the country in EVs, distressing pollution levels, would accelerate India's transition to EVs and enable the government to near its vision. However, there is still a long way to go. India's progress on electric mobility has been commendable, but the transition will certainly take place at a steady pace. What is important is that the right path has been laid and the shift has started to happen.

Actions needed for sustained growth of cleaner mobility in India

a. **OEMs:** Re-imagination GTM strategy for OEMs I India is required especially in a post-pandemic era. The pandemic has increased consumer comfort with contactless purchases, and 25 percent of Indian customers are now willing to use digital channels to buy high-value items.7 As in other countries where e-commerce has taken off, businesses are most likely to win if they offer a seamless omnichannel experience, where customers can easily switch among modes as they consider and purchase items. To manufacture EVs or their components, both OEMs and suppliers must invest in new equipment and capabilities. Close collaboration is essential to ensure a mutual understanding of supply chain requirements, essential components, and end products. Ideally, OEMs will offer long-term contracts to reassure suppliers that their investment will pay off. These agreements also guarantee OEMs a stable source of components..

b. **Government & Industry Associations:** Industry bodies or associations, as well as government, must help develop a path forward for the automotive and mobility sectors. This may include creation & maintenance of incentives to encourage EV adoption; this could include offering policies that enable development of the local supply chain to reduce dependence on imports of critical components; this is especially important for EVs, since over 60 to 70 percent of their components (in value terms) are imported. Also, the R&D facilitation and ensuring liquidity through various mechanisms; for instance, the government could incentivize banks to lend money and fleet operators could partner with non-banking financial corporations to disburse loans

c. **Mobility-Service Providers:** Mobility-service providers with small-format vehicles will gain strength in the current downturn. However, players who are dependent on four-wheelers will have to identify new business models, such as self-drive rentals and long-term lease rentals, to stimulate business. Having an extensive number of EVs in the fleet would reduce operating costs and increase drivability, which is a major factor when consumers are choosing a vehicle. It would also allow seamless integration of electronics and telematics. Mobility-service providers can collaborate with OEMs to create a path forward for the industry. Together, they could play a pivotal role in managing the downturn, embracing discontinuities, and sharing the financial and intellectual challenges involved in developing capabilities that will allow them to embrace disruptions like ACES.

6. Key Takeaways

Steps to Increase Penetration of EVs in India	Current Status in India
ICE engines to be banned by 2030	✗
Imposition of fines targets for corporate CO_2 emissions are exceeded	✗
High Import Duties	✓
Purchase Incentives/Tax Deductions	✓
Sound Incentive Scheme	✗
Establishing Charging Infrastructure	✓
State wise End Subsidies to OEMs	✓
Economic Recovery Plan for EVs	✗
Road Tax Incentives	✓
Bonuses for Leasing	✗
Funds to Commercial Vehicle Segment	✗
Fleet Exchange Program	✗
Funds for Battery Cell Production	✗

Source: Channel Checks, eninrac research & analysis

7. About Eninrac Consulting

eninrac is a leading provider of research, analytics and advisory services for your business nestled under different industry with unique insights to stakeholders across the globe. eninrac blends extensive knowledge of all aspects of your business industry to provide unmatched analytical insights, innovative strategies, and measurable value creation. We add value with pace, certainty and strategic agility and strive to exceed client expectations by delivering consistent results. We help our clients in unlocking potential and empowering organizations to achieve business objectives and goal effectively. We at eninrac put clients at the centre of our business and transform their risks into high rewarding opportunities through our innovative solutions.

The life of a man consists not in seeing visions and in dreaming dreams, but in active charity and in willing service

- Henry Wadsworth Longfellow

Contact Us

Contact – Head Office	Contact – NCR Office	Contact – Mumbai Office
Address : 5th floor, Caddie Commercial Tower, Aerocity (DIAL), New Delhi - 110037	Address: 1st Floor, Joy Tower, C-20, 1/1A,C Block, Phase 2, Ind. Area, Sector 62, Noida - 201301	Address : 4th Floor Duru House, Juhu, Opposite JW Marriott, Mumbai, Maharashtra

connect@eninrac.com

+91 7290016953

www.eninrac.com