

EXPLANATORY NOTE ON REGULATORY LANDSCAPE FOR CLEAN VEHICLES

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INTRODUCTION

India's transport sector is the third largest energy-related greenhouse gas (GHG) emission source after the power and industrial sectors.¹ It contributes to 13.5 percent of the country's energy-related CO₂ emissions, with road transport alone accounting for over 90 percent of this share.² Estimates suggest that India's share of emissions in the sector is projected to increase by 60 percent by 2050.³ Anticipating this rapid growth and designing for this transition is vital for India to achieve its emission targets. Transition to clean vehicles⁴ is governed by both Union and State level policies. In addition to governmental agencies, the large number of private and quasi-governmental stakeholders form an important part of the ecosystem. Being a signatory to the Paris Agreement and aiming for zero emissions from the transportation sector by 2050⁵, it is imperative that all tiers of the government approach the journey towards decarbonizing the

¹ "Decarbonizing India's Road Transport: A Meta-Analysis of Road Transport Emissions Models", *The International Council on Clean Transportation* (May 2022) < https://theicct.org/wp-content/uploads/2022/05/Meta-study-India-transport_final.pdf>

² Ibid

³ "Decarbonising Transport Initiative", *International Transport Forum*
< <https://www.itf-oecd.org/sites/default/files/docs/decarbonising-india-transport-system.pdf>>

⁴ Clean fuel includes electric vehicles (EV), CNG powered vehicles, as well as newer technologies such as ethanol blending in conventional fuel, hydrogen ion batteries etc. Union and State level policies and schemes are largely focused on adoption of EVs and CNG, with other policies encouraging development of newer technologies.

⁵ "Decarbonising Transport: Redefining Mobility Policies in India", *The Indian Express* (23 June 2021), < <https://indianexpress.com/article/opinion/decarbonising-transport-redefining-mobility-policies-in-india-7372279/>>

transportation sector in a coordinated manner. In this context, it is necessary to examine the transition to clean fuel mobility at the national and subnational level.

Governance framework and Stakeholders at the Union level

The principal legislation governing transportation in India is the *Motor Vehicles Act, 1988* (MVA). The Ministry of Road Transport and Highways (MoRTH) prepared a draft amendment in 2015 defining and regulating e-rickshaws and e-carts. This was enacted by the Parliament, and the Ministry thereafter notified rules under the *Central Motor Vehicle Rules, 1989* (CMVR), such as *Rule 124, CMVR*, requiring approval of prototypes as per *Rule 126*. Other rules notified pertain to grant of driving licenses, exemption from registration tax, notifying technical specifications, and subjecting prototypes to tests. While MVA provides a framework defining the legality of EVs and manner of registration and licensing, NEMMP and FAME (elaborated below) provide for the necessary incentives to facilitate the shift to EVs from conventional Internal Combustion Engine (ICE) vehicles.

The Government's flagship *Faster Adoption and Manufacturing of e-vehicles (FAME)* scheme under the *National Electric Mobility Mission Plan (NEMMP)* has also provided the impetus needed for the transition across the country.⁶ This scheme provides for demand incentives and incentives for charging infrastructure. INR 10,000 crore was allocated for FAME-II, 86 percent⁷ or INR 8,596 crore of which was set aside for demand incentives such as direct subsidies. It supports five lakh electric three wheelers (e3W)⁸, in addition to other categories of EVs across the country. The scheme also sets aside a total of INR 1,000 crore for encouraging development of charging infrastructure. In addition, the Union Government, through the Ministry of Petroleum and Natural Gas, notified the *National Policy on Biofuels* in 2018, that, along with the amendment to the *Industries Act, 1959*, allows States to produce denatured ethanol for admixture into conventional fuel.

⁶ National Automotive Board, Ministry of Heavy Industries, Government of India <<https://fame2.heavyindustries.gov.in/>>

⁷ "Electric 3Ws make 47% of all three-wheelers sold in India", *EV Reporter* (9 May 2022) <<https://evreporter.com/electric-3ws-dominate-three-wheelers-sales-fy-21-22/>>

⁸ E3W include e-rickshaws and e-autos both. E-autos differ from e-rickshaw in terms of dimensions and speed. While e-rickshaws are permitted to travel at a maximum of 25 kmph, e-autos, which are intended to replace auto-rickshaws, travel significantly faster. E-auto sector is well regulated unlike the e-rickshaw sector.

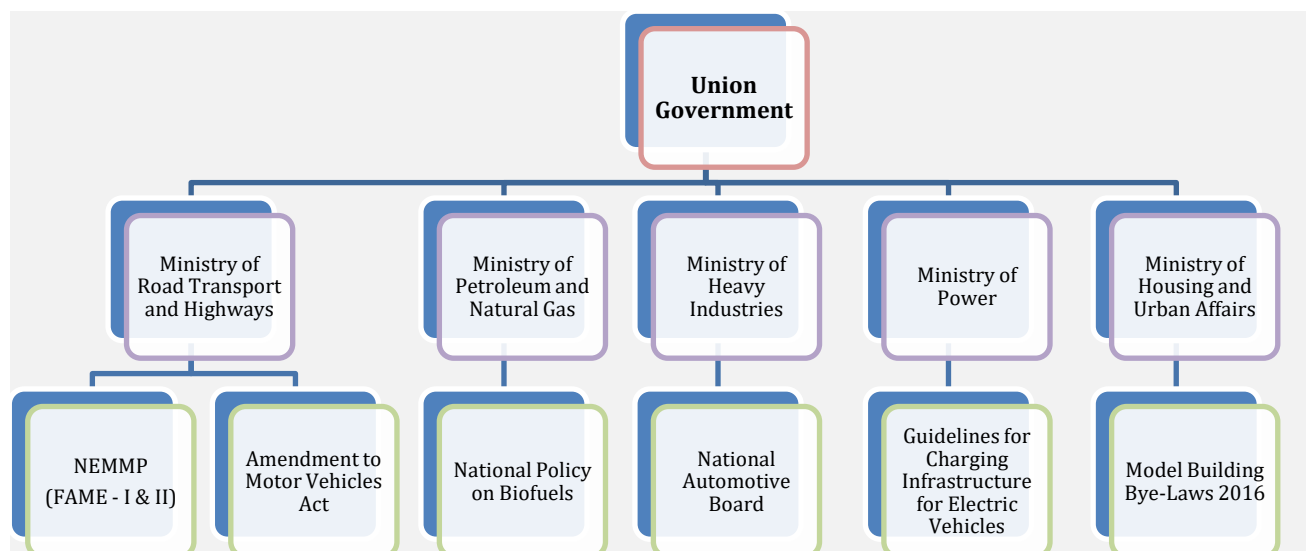


Figure 1: Thematic representation of Stakeholders in the Union Government

Several other acts passed by the Parliament and their rules pertain to the transition to clean fuel, such as, *Environmental Protection Act, 1986*; *The Air (Prevention and Control of Pollution) Act, 1981*; *Hazardous Waste Rules, 2016*; *E-waste Management Rules, 2022*; *Battery Waste Management Rules, 2022*. The Union Government has taken several other policy and regulatory measures such as Ministry of Housing and Urban Affairs' *Model Building bye-laws, 2016*, Ministry of Power *Guidelines for Charging Infrastructure for Electric Vehicles*, *PLI Scheme for National Programme on Advanced Chemical Cell (ACC) Battery*, and *Pradhan Mantri Mudra Yojana (PMMY)* for easy loans and direct subsidies.

Due to the multisectoral nature of mobility and transition therein, it is essential that the sector have a regulatory body with adequate powers and functions, and essentially function as the “lead agency” in the sector. The formation of the multi-stakeholder *National Council on Electric Mobility (NCEM)* aims to address this through diverse members from stakeholder ministries and departments, and the private automotive sector. The secretariat of the council is the *National Board on Electric Mobility (NBEM)* and they are advised by the *National Automotive Board (NAB)*.

Gaps in National Policies and Regulations:

Central policies and regulations, although merely enabling in nature, are still insufficient in regulating the sector. For e.g., the amendment to MVA, which defines and regulates e-rickshaws and e-carts, fails to define and regulate other forms of electric vehicles such as buses, electric two- and four-wheelers. Even among e3W, unregulated vehicles lacking standardisation continue to ply despite MVA regulating the segment of vehicles.⁹ In fact, the MVA was hastily amended for this very reason, amid reports of unlicensed drivers of e-rickshaws plying without permits and registrations. As to why the amendment includes under its ambit only e-carts and

⁹ “Why electric rickshaws need better regulation in India”, *Down to Earth* (14 June 2021) <
<https://www.downtoearth.org.in/blog/energy/why-electric-rickshaws-need-better-regulation-in-india-77440>>

e-rickshaws, and whether another amendment can be introduced to include all other forms of electric vehicles is to be deliberated by the relevant stakeholders.

Further, while the NCEM functions as a lead agency at the Central Level and is represented by Union Ministries, it is permanently chaired by the Minister for Heavy Industries and Public Enterprises. This defeats the very purpose of establishing a lead agency as regulatory bodies need to be independent and not hold stake in the sector. For instance, the civil aviation ministry is a key stakeholder in the aviation sector, but the Directorate General for Civil Aviation (DGCA) is the lead regulatory body in the sector, and the Ministry does not assume the role unto itself. Given the high-stakes in the aviation sector, it is obvious that the lead agency is indeed an independent body. This is not the case in the transport sector. MoRTH similarly assumed the role of lead agency for road safety by permanently chairing the National Road Safety Council (NRSC). In addition to the revisiting the composition of lead regulatory bodies, there is a dire need for regulatory bodies for stakeholders at the State level as well. This is not uncommon in other sectors. For e.g., MVA provides for the setting up the NRSC at the Central Level, and provides, similarly, for the setting up of State and District Road Safety Councils, that all act as lead agencies in their respective jurisdictions and have distinct powers and functions.

Governance Framework and Stakeholders in Bihar

At the State level in Bihar, the government has notified the *Bihar Swachh Indhan Yojana*, which provides for incentives to shift from petrol and diesel vehicles to CNG and Battery-Operated Electric Vehicles (BEV). The State Government has also amended the *Bihar Industrial Investment Promotion Policy (BIIPP)* by introducing demand-incentives for electric vehicles and incentives for charging infrastructure. The amended BIIPP acts as the state EV policy and aims to create a manufacturing ecosystem for e-vehicles in the state. The Bihar State Road Transport Corporation (BSRTC) and the Department of Transport are the nodal institutions or primary stakeholders that are in charge of putting the EV strategy into action. These State level policies compliment the benefits that the State receives through FAME and other central government initiatives. Key features of the Bihar EV Policy include (i) fifteen percent subsidy on base price for first 100,000 EVs, (ii) incentive of Rs. 10,000 to e-rickshaw using lithium-ion battery, (iii) Manual pedal rickshaw to be upgraded / converted to electric, (iv) exemption from registration fees and road tax, (v) top-up subsidy of Rs. 8,000 if user is below poverty line or SC/ST category, (vi) One hundred percent exemption on registration tax, exemption from tolls and parking charges, (vii) ten percent interest subvention if manufactured in Bihar, (viii) twenty-five percent capital subsidy for first 250 public charging stations, (ix) public charging points in residential areas, societies, bus depots, public parking areas, railway stations and fuel pumps, (x) fast charging stations at every 50 kms on national / state highways, (xi) robotic battery swapping arm at public bus stations, (xii) Charging infrastructure at all major government offices and 'Rain Baseras' for e-rickshaw, (xiii) Captive power production and open access for EV charging stations.

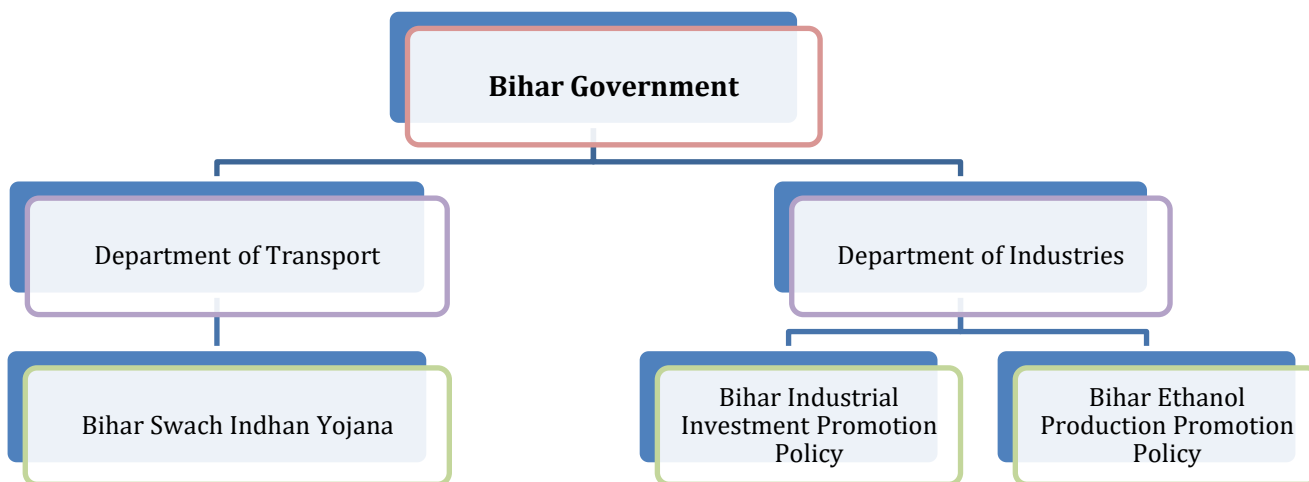


Figure 2: Government of Bihar Policies and Schemes

Gaps in Bihar Policies and Regulations:

The relevant policies and schemes in Bihar have also been insufficient in regulating the sector. For e.g., the *Bihar Swach Indhan Yojana* is applicable only in the jurisdictions of Patna Municipal Corporation (PMC), and the Municipal Councils (Nagar Parishad) of Danapur, Khagaul and Phulwarisharif. Further, the policy applies only to passenger vehicles and does not include under its ambit commercial freight vehicles. Even the Bihar EV policy is only an amendment to the already existing BIIPP, in which EVs have been identified as a priority sector. This is insufficient in addressing key challenges to greater EV manufacturing and adoption and is evident in the lower EV penetration in the State than desired. For e.g., as per April 2022 data, Uttar Pradesh had the highest number of EV registrations in the country as opposed to Bihar’s share of a mere 4 percent.

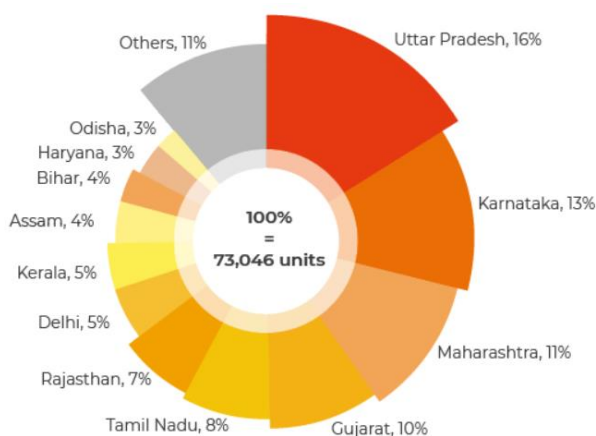


Figure 3: Share of EV Registration by State in 2022
Source: Vahan Dashboard

This can be seen in the figure 3, which indicates that States having a robust and dedicated EV policy and that provide a suitable environment for the EV ecosystem to thrive have performed better at total EV registrations. This is further established when one looks at the share of EVs by category in each State. Electric 3-wheelers (e3W) have dominated the registrations UP, Bihar and Assam, while states such as Telangana, Karnataka and Maharashtra have greater registrations of e2W. Various demand and supply side factors contribute to this difference in EV registrations across states, but

it is evident that e3W and e2W dominate the market. Therefore, prioritising these segments may

be low hanging fruits for poorly performing States to catch up with those performing better in EV transition.



Figure 4: State-wise EV Registration by Category in 2021.

Source: EV Reporter

Consequently, those states with high number of e3W registrations such as UP, and to a lesser extent, Bihar, have seen rapid growth of EVs for paratransit (last mile connectivity of passengers in urban areas), and urban freight. Bihar government has doubled down on this segment by increasing its e3W fleet through FAME subsidies, as well as attempting to incentivise this segment in the Bihar EV policy. However, the upfront costs of transition in this segment despite the incentives are prohibitively expensive for most potential buyers of e-rickshaws, even those with unregulated lead-acid batteries. In fact, the typical price of a bottom-range e-rickshaw is INR 1.3 lakh amounting to over four months of earnings for an average driver to own the vehicle. Additionally, a large number of them do not comply to prescribed standards and specifications. In 2021, organised sellers sold 1,500-2,000 units per month versus unorganised sellers that sold over 10,000 units¹⁰ in the country.

Therefore, the financial incentives in FAME and Bihar EV policy are insufficient in facilitating the desired growth of EVs for paratransit and urban freight in the State. There is a need for a comprehensive and dedicated EV policy in line with best practices in the country such as those of Uttar Pradesh and Tamil Nadu.

The table below briefly compares provisions in the EV policy of Bihar with those in the states of Uttar Pradesh and Tamil Nadu. It indicates the provisions that are missing in the Bihar policy, which have been crucial for these states for the rapid growth in EV registrations. Further, these states have a dedicated EV policy, as opposed to Bihar wherein there has only been an amendment to the BIIPP making EV manufacturing a priority sector.

¹⁰ "Why e-rickshaws have emerged a winner in transition to electric mobility race", *Down to Earth* (04 Mar 2021) <<https://www.downtoearth.org.in/blog/air/why-e-rickshaws-have-emerged-a-winner-in-transition-to-electric-mobility-race-75767>>

	Uttar Pradesh	Tamil Nadu	Bihar
CHARGING INFRASTRUCTURE-RELATED INCENTIVES			
Capital subsidies to service providers			
Charging Stations	✓	✓	✓
Swapping Stations	✓	✓	✓
DEMAND INCENTIVES/INCENTIVES FOR BUYERS			
Exemption from Registration Fees and Road Tax	✓	✓	✓
Purchase Subsidy	✓	✓	✓
Waiver on Permit Fees	✓	✓	✗
SUPPLY INCENTIVES/INCENTIVES FOR MANUFACTURERS			
1. EV Special Manufacturing Package			
Inclusion of R&D in Eligible Fixed Assets	✗	✓	✓
Investment Promotion Subsidy	✓	✓	✗
Electricity Tax Exemption	✗	✓	✗
Stamp Duty	✓	✓	✗
Subsidy on Cost of Land	✓	✓	✗
Employment Incentive	✓	✓	✗
Green Industry Incentive	✗	✓	✗
Quality Certification Incentive	✓	✓	✗
Intellectual Property Creation Incentive	✓	✓	✗
2. Special Investment for MSME Sector			
Capital Subsidy	✓	✓	✗
Retrofitting and Re-manufacture	✗	✓	✗

Urban areas in Bihar also lack the infrastructure for EVs at the moment, and the built environment is not conducive for their adoption. While FAME-II allocated a total of INR 1,000 crore towards charging stations and there is additional budget allocation through the Bihar EV policy, the State lacks the necessary resources for setting up charging stations to meet the demand. Further, road infrastructure is not optimised for EVs in Bihar. The maximum speed of e-rickshaws is 25 kmph (significantly lower than ICE vehicles), yet they are forced to occupy the same road space. Incorporating their needs in street-design standards such as *Indian Roads Congress (IRC)* guidelines is imperative to safety and to accommodate their projected numbers. Dedicated non-motorised transport (NMT) lanes, wherever feasible, is in the domain of urban local bodies (ULB) and Bihar government needs to ensure that ULBs receive adequate resources for creating segregated lanes for EVs and NMTs. This is an issue not just in Bihar but across urban areas in India. Municipal governance is abysmal across the country and State governments treat cities as cash cows for the diversion of funds into the hinterland. Better urban governance by the implementation of the 74th Amendment to the Constitution in letter and spirit has been missing in India due to this very reason and requires further policy enquiry.

Private Stakeholders and their role in the transition

Private stakeholders in the EV industry are primarily the manufacturers of EVs and related components. They are guided by tax incentives, subsidies under FAME and other subsidies in the respective EV policies of States to set up manufacturing facilities. They are also guided by the investments and incentives such as lower-interest loans provided by financing parties such as banks. Financers also have a role in similarly incentivising the end user in the form of subsidies and interest-free loans to adopt EVs. Further, developers and operators of EV support infrastructure such as operators of charging facilities and swapping stations are vital stakeholders in the sector for transition. Ultimately, all these players aim to incentivise consumers. The thematic representation below informs the way these parties interact with each other.

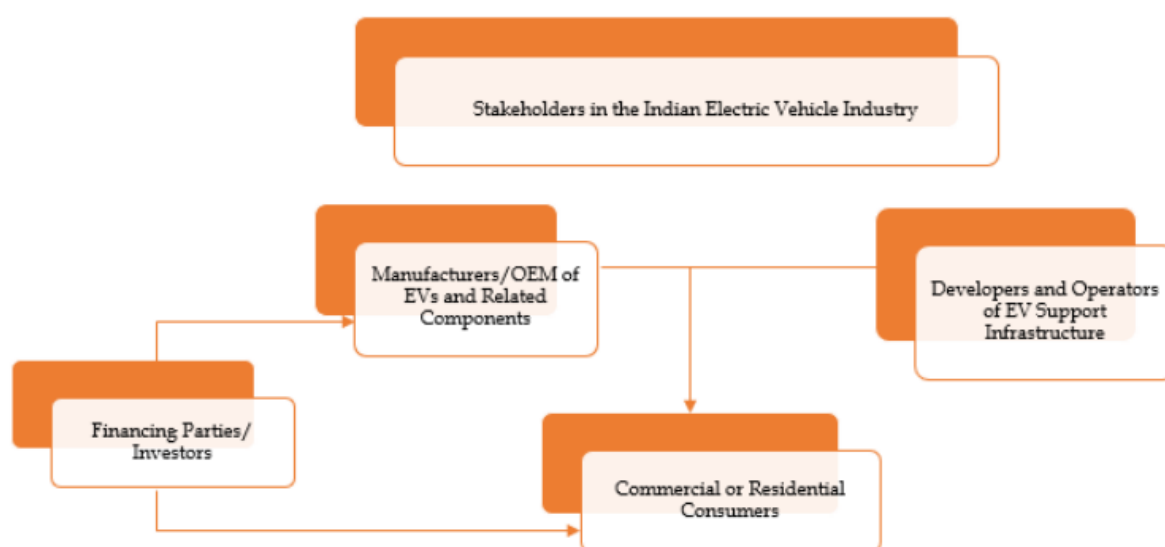


Figure 5: Private Stakeholders in the EV ecosystem and their interaction with commercial or residential consumers

Automobile Manufacturing

Mobility transition in the auto industry is built on three major pillars: value addition, job creation, and manufacturing competitiveness.¹¹ Manufacturing plants require skilled workforce and advanced machinery. For this, the availability of raw materials and supply chain will be crucial, and hence, some states in India are better positioned to lead the transition. Raw material suppliers form the first link in the value chain of the manufacture of EVs. Raw materials for EVs require the mining of rare heavy minerals and metals such as Cobalt, Nickel and Lithium.

According to research by the *Council on Energy, Environment, and Water* (CEEW), localization of electric powertrains and battery-pack assembly might result in a 6% increase in output value addition for the auto sector in a scenario where EVs account for 30% of passenger car sales.¹² In

¹¹ "How can emerging economies navigate the mobility transition?", *WEForum* (Jan 2020), << <https://www.weforum.org/agenda/2020/01/how-can-emerging-economies-navigate-the-mobility-transition/>>>

¹² Soman, Abhinav, Karthik Ganesan, and Harsimran Kaur. 2019. *India's Electric Vehicle Transition: Impact on Auto Industry and Building the EV Ecosystem*. New Delhi: Council on Energy, Environment and Water. << <https://www.ceew.in/publications/electric-vehicle-transition-and-impact-on-indian-economy-auto->

an industry with tight margins, the ability to source raw materials as well as human capital locally are significant factors for manufacturers to consider. The conducive ecosystem necessary for a viable component manufacturing unit is concentrated in areas in proximity to raw materials (ports and airports) and skilled human resources. For e.g., Tamil Nadu, which has been a leader in auto manufacturing in India has the conducive ecosystem of raw material availability, has a large availability of human resources engaged in the auto industry, and is in close proximity to product engineering and marketing teams in Bengaluru. Coupled with a robust and dedicated EV Policy, this has given the impetus for TN to attract investments by Original Equipment Manufacturers (OEM) for setting up manufacturing plants. Therefore, even with adequate demand for EVs and enabling policies to incentivise manufacturing, some states with existing value-chains are better positioned to lead the transition from a manufacturing perspective.

Financers and Support Infrastructure

Commercial Banks provide loans to buyers and manufacturers of vehicles. They can provide additional demand- and supply-side incentives by offering lower interest rates for the purchase of hybrid vehicles/EVs or for setting up manufacturing plants of clean vehicles. Developers and operators of support infrastructure like charging stations and swapping stations are guided by the investments and incentives provided to them under State EV Policies and FAME. These operators hold vital stake in the transition to clean mobility. They must be provided subsidies to set up and operate support infrastructure. The Bihar EV Policy, for e.g., provides incentives for the setting up of charging infrastructure.

Way Forward

The mobility sector needs a vision supported by a technology-investment-regulatory roadmap, one that embraces the spirit of entrepreneurship and value creation. This vision will have to consider policy decisions that balance economic development, energy security, and environmental effects. States must view the transport industry as a driver of economic progress rather than a polluter and consumer of natural resources. The shift to cleaner fuels can help improve public health, optimise mobility, create new job opportunities and promote the growth of the sector. However, the success of this transition will depend on a range of factors, including the availability of infrastructure, the affordability of alternative fuels, and the willingness of consumers to switch to clean energy options. Anxiety among consumers is still high due to the lack of range provided by batteries. The mileage of batteries with a full charge is insufficient for their intended day-long use for paratransit or freight. Additionally, Bihar must also ensure that private entities such as startups specialising in battery swapping and manufacture of support infrastructure are leveraged to create a sustainable ecosystem for the growth of this industry along with its allied businesses. Since much of these newer technologies yet to be fully adopted

in the State, mobility transition presents an opportunity to leapfrog to a cleaner, healthier, and more sustainable future for Bihar.