WHEELS OF CHANGE

UNDERSTANDING **EV ADOPTION** FOR MUMBAI'S AUTO & TAXI DRIVERS

CLIMATE RESEARCH CONSULTANCY

waatavaran

asar

SUSTAINABLE MOBILITY NETWORK

CLIMATE RESEARCH CONSULTANCY

Climate Research Consultancy (CRC) is a knowledge-driven organisation committed to advancing data-led, evidence-based climate solutions. With expertise in research, policy analysis, and on-ground assessments, CRC works with governments, multilateral agencies, private sector actors, and civil society organisations to design strategies that are rooted in local realities and global best practices. The consultancy focuses on key themes such as air quality, sustainable mobility, energy transition, urban resilience, and climate adaptation. CRC supports decision-makers by providing actionable insights, ground-truth verification, and impact evaluations that bridge the gap between policy ambition and community needs. By convening dialogues, producing high-quality research, and building collaborative networks, CRC plays a pivotal role in shaping equitable and ambitious climate action across cities in India.

waatavaran

Waatavaran Foundation is a not-for-profit social organisation working at the intersection of climate action, community empowerment, and environmental justice. Founded in 2018 and headquartered in Mumbai, Waatavaran is dedicated to protecting the planet and its most vulnerable communities by building resilience, amplifying citizen voices, and fostering collaborative solutions. The organisation works hyper-locally across cities and towns to slow down the impacts of climate change through evidence-based advocacy, clean air initiatives, youth engagement, and partnerships with government, academia, and civil society. Through various initiatives Waatavaran has mobilised thousands of citizens and stakeholders to safeguard public health, reduce air pollution, and advance sustainable transport practices. Its vision is to accelerate climate action in a way that upholds human dignity and secures a climate-habitable environment for all.

asar

Asar Social Impact Advisors is a startup in the environment and social justice impact space with a commitment to building climate resilience and ambitious climate action. We identify challenges and opportunities, research them, verify ground truths, and understand local contexts, in order to build innovative strategies that are rooted in reality. Asar convenes multi-stakeholder conversations and helps build relationships between various key actors to be able to sustain collaborations essential to deliver real-world impact.

SUSTAINABLE MOBILITY NETWORK

The Sustainable Mobility Network (SMN) is a coalition of over 20 organisations that focuses on enabling clean, equitable and accessible transport across five major cities in India - Bangalore, Delhi, Chennai, Kolkata and Mumbai. SMN strives towards the Triple Zero Approach - Zero Emissions, Zero Exclusions, Zero Road Deaths. Since its inception in 2021, the network has ensured that the demand for clean, equitable, gender-sensitive and accessible transport is made visible through strong people-powered narratives that contribute to city-state and national level change and transition. The network supports local action, research, and communications efforts that centre the needs of communities, advancing evidence-based solutions to transform India's mobility landscape.

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EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

The objective of this survey is to identify the concerns of auto and taxi drivers in Mumbai that positively influence their decision to transition from conventional petrol/diesel/ CNG vehicles to electric vehicles (EVs).

The findings aim to assess potential barriers, determine the necessary support systems, and encourage the adoption of sustainable transport solutions. This study captures on-ground insights from auto and taxi drivers in Mumbai regarding the shift to electric vehicles (EVs), outlining key barriers, perceptions, and pathways for a just transition. The study has captured the perceptions of 1,200 auto and taxi drivers across Mumbai, and in the process, identified both enablers and barriers influencing their shift to EVs.

METHODOLOGY

The study examined EV transition perceptions among 1,200 auto and taxi drivers across Mumbai's 24 wards.

Using face-to-face interviews combining quantitative and qualitative questions, researchers collected data digitally via Kobo Toolbox while utilizing QGIS to analyse participants' geographic distribution, ensuring comprehensive representation throughout the city.

KEY FINDINGS

Challenges

81% auto and taxi drivers consider traffic congestion as a challenge while operating autos and taxis while 55% feel parking as a challenge too

Support Needed

Drivers prioritize purchase subsidies (64%), better charging infrastructure (53%), and financial incentives.

Perceived Benefits

39% believe EVs have better performance and lower operating costs.

Barriers

High initial investment (60%) and lack of charging infrastructure (62%) emerged as top challenges.

Economic Impact

39% foresee positive effects on earnings, while 38% are uncertain.

Awareness

85% of drivers are aware of electric autos and taxis.

RECOMMENDATIONS

Mumbai's Strategy for Transitioning to Electric Auto-Rickshaws and Taxis should include:

Infrastructure Development	Establish fast-charging stations and battery-swap facilities and integrate these into a unified national EV infrastructure network.
Financial Support	Provide low-interest loans, tax exemptions, and subsidized charging rates to make EVs more affordable.
Maintenance Cost Reduction	Offer partial reimbursements and subsidies for repair shops to reduce long-term maintenance expenses.
Simplified Registration Process	Streamline vehicle registration through reduced paperwork and user-friendly online portals.
Long-Term Policy Framework	Ensure clear and consistent EV policies spanning 10–15 years to provide certainty for investors and users.
Dedicated EV Parking and Charging	Create dedicated parking with charging facilities in high-demand areas, with special provisions for slum dwellers.
Enhanced Vehicle Scrapping Policy	Offer higher scrapping incentives and special operating permits for EV drivers. Promote eco-friendly recycling practices to responsibly dispose of conventional vehicles.

CONTEXT OF THE STUDY

Mumbai, the financial capital of India and home to over 20 million people, is a bustling metropolis known for its vibrant culture, iconic landmarks, and relentless pace. Often referred to as the "City of Dreams," Mumbai thrives on its diverse population, serving as a hub for commerce, entertainment, and education.

However, its dynamism comes with its set of challenges, of overcrowding, traffic congestion and rapidly increasing levels of air pollution. Mumbai is multi-modal in terms of transport infrastructure having both rail and bus services as modes of public transport, taxis and autorickshaws, and individual transportation modes like personal cars and two-wheelers. To meet the rising demand, the vehicular population has increased sharply in Mumbai and 'has far exceeded the carrying capacity of roads in Mumbai.

Over the past five years, the number of vehicles has grown from about two million to three million, an increase of 50% in Mumbai. However, the road length in Mumbai, at around 2,000 km, has not changed significantly during the same period. Vehicle density has thus increased to approximately 1,500 vehicles per km in 2018-19 from 935 in 2011- 12. The auto and taxi drivers of Mumbai form the backbone of the city's dynamic and fast- paced environment. They play a crucial role in connecting public transport systems with individual destinations, ensuring seamless last-mile connectivity for millions of residents and visitors hustling through their daily routines. However, as more people flock to Mumbai in pursuit of opportunities, the city's limited urban landscape faces increasing strain. Congested roads, driven by redevelopment projects and the growing number of vehicles, are contributing significantly to rising pollution levels.

According to the Global Air Quality Index, the IQAir portal ranks Mumbai as the 13th most polluted city in the world, with the transportation sector being its second-largest contributor. This year, Mumbai's vehicle population surpassed 46 lakh, resulting in a staggering density of 2,300 vehicles per square kilometre. Reports indicate that vehicle density in the city has risen by 25% over the last five years, with approximately 14 lakh light motor vehicles in Mumbai alone - an average of 700 per square kilometre. A 2023 TERI report warns that unchecked vehicle proliferation could push transport emissions beyond 20% by 2030-31, any further increase could severely impact vulnerable populations, including the elderly, youth, and those with respiratory or cardiac conditions.

Transitioning to EVs has significant potential to reduce local air pollution, leading to better respiratory health for drivers and commuters. Communicating these public health benefits is critical to build wider societal support.

To mitigate transportation emissions, governments worldwide, including India, are promoting the adoption of electric vehicles (EVs). EVs are estimated to reduce CO2 emissions by 8-24% compared to vehicles with internal combustion engines. Despite these efforts, Mumbai has struggled to transition toward sustainable mobility. This perception survey seeks to understand the challenges and barriers auto and taxi drivers face in adopting EVs. By capturing their perspectives, the survey aims to identify and address the gaps, enabling a smoother transition toward cleaner air and a more sustainable urban future.

FIRST- AND LAST-MILE CONNECTIVITY

Auto-rickshaws and taxis serve as crucial components of Mumbai's last-mile connectivity, bridging the gap between major transit hubs and commuters' final destinations. In the suburbs beyond Bandra in the west and Sion in the east, auto rickshaws dominate the intermediate public transport landscape, offering swift and cost-effective mobility solutions. Their compact size allows them to navigate through congested lanes and narrow streets that are often inaccessible to larger vehicles, making them particularly valuable in Mumbai's dense urban fabric. During peak hours, these three-wheelers cluster around railway stations and bus depots, forming an essential link in the commuter's journey. Share-auto services have also emerged on popular routes, providing an economical option for regular commuters traveling in the same direction.

The iconic black-and-yellow taxis, predominantly operating in South Mumbai and select suburban areas, complement the auto-rickshaw network with their distinct service characteristics. They offer greater comfort, higher passenger capacity, and round-the-clock availability in core city areas. These taxis are particularly crucial for connectivity to business districts, airports, and major railway terminals, where their professional drivers' comprehensive knowledge of the city proves invaluable. The recent integration of both autos and taxis with mobile booking platforms has enhanced their accessibility, though traditional street-hailing remains prevalent.

However, this last-mile connectivity system faces several challenges. Infrastructure constraints, including limited waiting areas at transit points and congested access roads, hamper efficient service delivery. Operational issues such as meter tampering, fare disputes, and refusal to ply short distances continue to affect service quality. The monsoon season particularly tests the resilience of this system, with both availability and reliability becoming concerns during heavy rains. Competition from ride-hailing services has also introduced new dynamics to this traditional transportation ecosystem. Their ability to provide flexible, demand-responsive services makes them indispensable for Mumbai's daily commuters, especially in areas where larger public transport options are limited or impractical.

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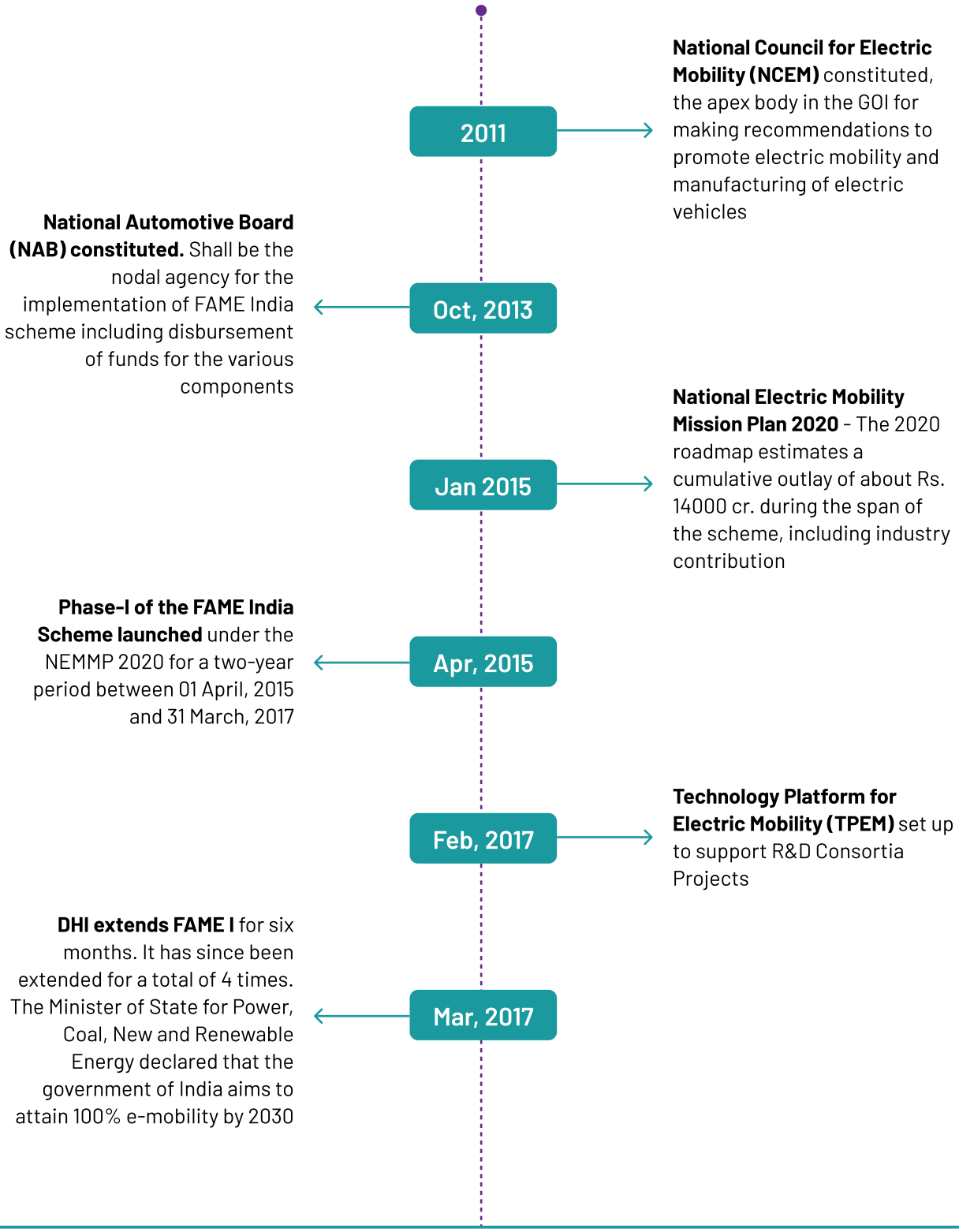
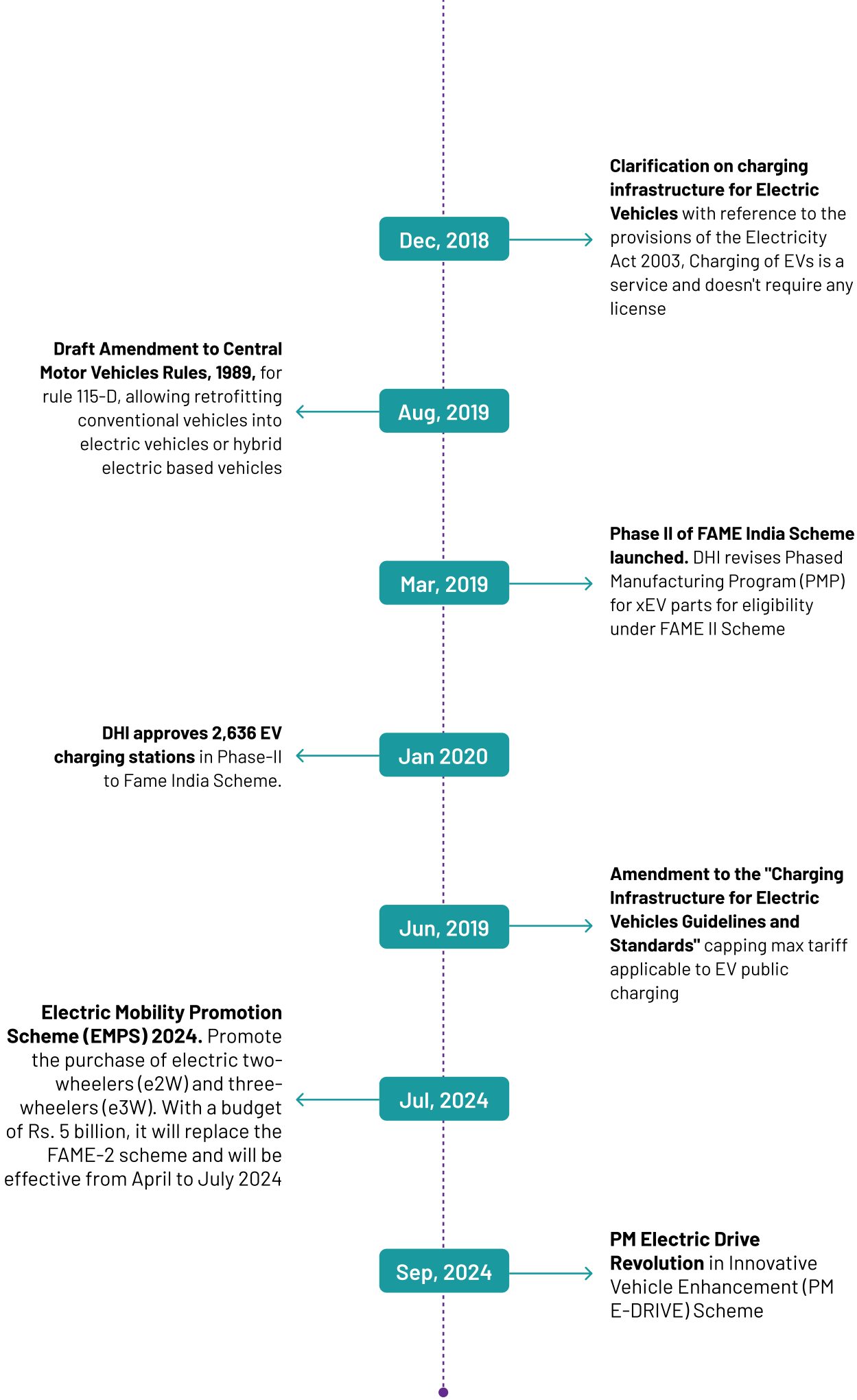
EVOLUTION OF EV POLICIES IN INDIA




Dec, 2018
Clarification on charging infrastructure for Electric Vehicles with reference to the provisions of the Electricity Act 2003, Charging of EVs is a service and doesn't require any license
Aug, 2019
Draft Amendment to Central Motor Vehicles Rules, 1989, for rule 115-D, allowing retrofitting conventional vehicles into electric vehicles or hybrid electric based vehicles
Mar, 2019
Phase II of FAME India Scheme launched. DHI revises Phased Manufacturing Program (PMP) for xEV parts for eligibility under FAME II Scheme
Jan 2020
DHI approves 2,636 EV charging stations in Phase-II to Fame India Scheme.
Jun, 2019
Amendment to the "Charging Infrastructure for Electric Vehicles Guidelines and Standards" capping max tariff applicable to EV public charging
Jul, 2024
Electric Mobility Promotion Scheme (EMPS) 2024. Promote the purchase of electric two-wheelers (e2W) and three-wheelers (e3W). With a budget of Rs. 5 billion, it will replace the FAME-2 scheme and will be effective from April to July 2024
Sep, 2024
PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme

MAHARASHTRA EV POLICY 2021

This comprehensive policy represents Maharashtra's commitment to accelerating EV adoption. The policy is notable for its multi-faceted approach, combining financial incentives with infrastructure development and urban planning initiatives.

POLICY OBJECTIVES

The primary objective of Maharashtra EV Policy 2021 is to accelerate adoption of BEVs in the state so that they contribute to 10% of new vehicle registrations by 2025. Other important policy objectives include:

A In the five targeted urban agglomerations in the state, achieve 25% electrification of public transport and last-mile delivery vehicles by 2025.

B Convert 15% of Maharashtra State Road Transport Corporation's (MSRTC) existing bus fleet to electric.

C Make Maharashtra the country's top producer of BEVs in India, in terms of annual production capacity.

D Target establishment of at least one Gigafactory for the manufacturing of advanced chemistry cell (ACC) batteries in the state.

E Promote research and development (R&D), innovation, and skill development across the EV ecosystem in the state.

SHARE OF EVS IN NEW VEHICLE REGISTRATIONS IN THE STATE IN 2025

Parameter	Target
All vehicles	10%*
 2 wheelers	10%*
 3 wheelers	20%*
 4 wheelers	5%*
 Fleet operators	At least 25% of the urban fleet operated by the fleet aggregators/ operators in the state will transition to EVs by 2025.
 Buses	i) In the five targeted UAs, achieve 25% electrification of public transport by 2025 ii) MSRTC to convert its existing bus fleet to 15% electric fleet
 Government vehicle fleet	Starting April 2022, all new govt. vehicles (owned/leased) operating within the major cities to be electric.

NOTE:
I. The 3-wheeler and 4-wheeler targets are inclusive of passenger as well as goods carrier vehicles.
II. E-commerce companies, last-mile delivery/logistics players and mobility aggregators should submit an EV transition plan to the Transport Department, GoM within six months from the date of notification of EV policy.
III. E-commerce companies include companies like Amazon, Flipkart, etc. Last-mile delivery/logistics players include Zomato, Swiggy and other courier and delivery firms and mobility aggregators include Ola, Uber, Black-yellow taxi, etc.

FAME

FASTER ADOPTION AND MANUFACTURING OF HYBRID AND ELECTRIC VEHICLES

The policy was introduced in 2015 under the National Electric Mobility Mission Plan (NEMMP) to reduce vehicular emissions, decrease fuel consumption, and encourage sustainable transportation.

FAME PHASE - I (2015-2019)

Focused on providing incentives for the purchase of electric and hybrid vehicles and supported the development of charging infrastructure. It aimed to promote cleaner mobility in public and private sectors.

The scheme was also aimed to provide a major push for early adoption and market creation of both hybrid and electric vehicles in the country. The thrust for the Government through this scheme was to allow hybrid and electric vehicles to become the first choice for the purchasers so that these vehicles can replace the conventional vehicles and thus reduce liquid fuel consumption in the country from the automobile sector. It was envisaged that early market creation through demand incentive, in house technology development and domestic production will help industry reach a self-sufficient economy of scale in the long run by around the year 2020.

The scheme planned to focus on:

- **A** Technology Development
- **B** Demand Creation
- **C** Pilot Projects
- **D** Charging Infrastructure

FAME PHASE - II (2019-2024)

Expanded the scope, providing INR 100 billion (US$1.19 billion) to encourage the adoption of electric vehicles, particularly in public transport (e-buses, 2-wheelers, and 3-wheelers). It also emphasised building a robust charging infrastructure and targeted reducing emissions from commercial fleets.

Highlights of the scheme

1. Electrification of Public Transport The policy focuses on penetration of EVs in public transport, with the maximum demand incentive of 3545 Cr. set aside for e buses

2. Under the FAME – 2 policy, subsidies have only been meted out for vehicles with advanced batteries, i.e. the policy effectively covers only Li-ion battery operated vehicles and does not cover Lead-Acid batteries

3. Promoting localization in manufacturing/ assembling of EVs and related components

4. Focus on advanced charging technologies and inter-linking of RE with EV charging.

SUBSIDIES UNDER FAME PHASE - II

Vehicle Segment	No. of vehicles supported	Approx. size of battery	Total incentive (INR)	Max. ex-factory price to avail incentive
Electric 2W	10,00,000	2 kWh	20,000	1.5 lakhs
Electric 3W	5,00,000	5 kWh	50,000	5 lakhs
Electric 4W	35,000	15 kWh	1,50,000	15 lakhs
4W strong hybrid	20,000	1.3 kWh	13,000	15 lakhs
Electric Bus	7,090	250 kWh	50,00,000	2 crores

PM E-DRIVE SCHEME 2024

India's Ministry of Heavy Industries (MHI) has announced the 'PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) Scheme' to accelerate adoption of electric mobility in the country.

The scheme offers subsidies and demand incentives worth INR 36.79 billion to support electric two-wheelers, three-wheelers, ambulances, trucks, and upcoming EVs. According to the central government's announcement, 2.47 million electric two wheelers, 316,000 electric three-wheelers, and 14,028 electric buses will be covered under the plan. Additionally, INR 43.91 billion has been allocated for public transport and state transportation organisations to purchase 14,028 electric buses. The PM eBus Sewa Payment Security Mechanism also provides INR 34.35 billion to support the electric bus market. Furthermore, INR 5 billion has been set aside for electric ambulances, and another INR 5 billion for electric trucks. The announcement also states that EV buyers will receive Aadhaar-verified e vouchers to claim demand incentives, which will be submitted to the dealer and uploaded to the PM E-DRIVE scheme's portal.

MAHARASHTRA PINK E-RICKSHAW SCHEME 2024

The main objective of launching the Maharashtra Pink E-Rickshaw Scheme is to employ the female citizens of the state. This scheme will empower women in Maharashtra state and make them self-dependent.

With the help of the scheme, the rate of employment in the state will increase significantly. With E-rickshaws, the government also aims to reduce pollution by replacing petrol rickshaws with electric. E-rickshaws driven by women will soon be available in all the major cities of Maharashtra like Mumbai, Nagpur, Thane And Navi Mumbai. Under this scheme, The Government of Maharashtra will give a 20% subsidy to female citizens so that they can buy an E-rickshaw. The applicant just has to give 10% of the amount of the e rickshaw and the rest 70% will be covered under bank loans.

MAHARASHTRA EV POLICY 2025

The Maharashtra Electric Vehicle Policy 2025, issued on 23rd May 2025, aims to establish the state as a leading hub for electric mobility in India. It promotes large scale EV adoption, domestic manufacturing, development of charging infrastructure, and supports environmental sustainability, economic growth, and energy security.

The policy targets 30% of all new vehicle registrations to be electric by 2030, with higher adoption rates for two-wheelers (40%), three-wheelers (40%), four-wheelers (30%), and buses (40% for public and 15% for private operators). It also mandates 100% EV transition for new government fleet vehicles in urban areas and requires charging stations at every 25 km on highways and in government office complexes.

To encourage EV uptake, the policy offers direct purchase incentives ranging from ₹10,000 to ₹20 lakh depending on the vehicle type, along with 100% exemption from motor vehicle tax and registration fees. Toll tax waivers are also granted on key expressways. Infrastructure development is a key focus, with plans for fast-charging stations across highways, urban areas, fuel stations, and bus depots, supported through viability gap funding. Building codes are being revised to make new residential and commercial structures EV-ready, while retrofitting targets are set for existing facilities.

The policy also supports EV manufacturing and battery recycling through incentives under the 'D+' category and promotes the setup of recycling hubs in cities like Mumbai, Pune, Nagpur, and Chhatrapati Sambhajinagar. R&D is another pillar, with ₹15 crore allocated to a CM EV R&D Grant. Research will focus on sodium-ion batteries, battery recycling, V2G (vehicle-to-grid) technology, and green hydrogen from biomass. Skill development is prioritized through specialized EV-related courses by the Maharashtra State Board of Technical Education (MSBTE) and certification programs for reskilling the workforce. A high-level Steering Committee chaired by the Chief Secretary will oversee implementation, while various departments are assigned specific responsibilities to ensure coordinated execution across demand, supply, infrastructure, and innovation.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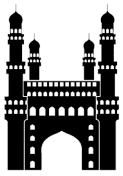
FEW CASE STUDIES

India's urban mobility transition is gaining momentum through city-led EV deployment models that integrate electrification with public transport, last-mile connectivity, and gender inclusion. These case studies from Indore, Hyderabad, Maharashtra and Delhi offer replicable models that link technology, finance, and social equity.

Criteria	 Indore	 Hyderabad	 Maharashtra	 Delhi
Model Type	Smart City-integrated e-rickshaw deployment	Metro-linked EV feeder service with battery swapping	Statewide EV auto scheme with gender inclusion focus	Aggregator-regulated e-rickshaw zones with subsidy support
Primary Objective	Strengthen last-mile access from BRTS/transit hubs using clean mobility	Decarbonize metro feeder services with cost-efficient swap infra	Deploy 10,000 e-autos with a focus on women drivers and inclusive livelihoods	Formalize and regulate last-mile e-rickshaw services; promote EVs incongested zones

Key Features	• E-rickshaws in Smart Mobility Plan • Swap points near BRTS/rail • 1,200 vehicles • Zonal allocation, route optimization	• E-autos connected to metro stations • GHMC-SUN Mobility partnership • Swap infra on public land • Battery-as-a-Service model	• 10,000 new permits • Reserved quotas for women • Subsidies + easy loans • Skilling via SHGs/NGOs	• Zoned e-rickshaw access near metro • ₹30,000 subsidy (state) + FAME benefits • Aggregator licensing • Route-based formalization
Impact	• Shift to public transport • Reduced ICE/ informal vehicles • Improved BRTS use	• High uptime (95%) • Cost savings for drivers (25–30%) • Increased metro ridership	• Women-led mobility businesses • Deployed across Mumbai, Pune, etc. • 3 - 4 tonnes CO2e saved / vehicle / year	• 1,000+ e-rickshaws under aggregator model • Lower urban air pollution • Enhanced metro connectivity in key areas
Enabling Policies	Smart City + Transit- Oriented Development (TOD) integration	Public-private partnership + metro-aligned land use	State EV policy with gender and finance components	• Delhi EV Policy 2020 • Zonal regulation • State + central subsidies • Aggregator accountability • New draft EV 2.0 Policy
Lessons for Scaling	• Align EVs with urban mobility masterplans • Prioritize hub-based swapping • Use tech for service quality	• Prioritize metro-EV integration • Leverage public land • BaaS for affordability	• Center equity and gender in EV policy • Pair with finance and skilling support	• Use zonal frameworks for order • Combine subsidy with clear enforcement • Support regulated private participation

OBJECTIVES OF THE STUDY

The objective of this survey is to identify the concerns of auto and taxi drivers in Mumbai that positively influence their decision to transition from conventional petrol/diesel/CNG vehicles to electric vehicles (EVs). The findings aim to assess potential barriers, determine the necessary support systems, and encourage the adoption of sustainable transport solutions.

The study further focuses on:

A Attempting to understand the social, economic, environmental challenges faced by drivers in Mumbai in the aspects of financial commitments, age factors and health issues

Assessing drivers' awareness of electric vehicles (EVs), their opinions regarding EV maintenance, the challenges they foresee in transitioning to EVs, and the type of support they expect from the government **B**

C Gathering insights on perceptions to understand the infrastructural advancements necessary for the widespread adoption of electric vehicles (EVs). This includes identifying key areas where improvements are needed, such as charging infrastructure, accessibility and battery performance

Identifying the perception of the impact of government financial incentives and training programs in encouraging drivers to transition to electric vehicles (EVs). This includes understanding how such support initiatives help alleviate the challenges and boost adoption rates among potential EV buyers **D**

METHODOLOGY

The study was conducted among Auto and Taxi drivers across Mumbai, aiming to gather insights into their perceptions, challenges, and readiness for transitioning to electric vehicles (EVs).

The following methodology was employed:

SAMPLE SIZE AND COVERAGE

A total of 1,200 drivers were surveyed. Data collection spanned across the 24 wards of Mumbai, ensuring geographic diversity and comprehensive representation.

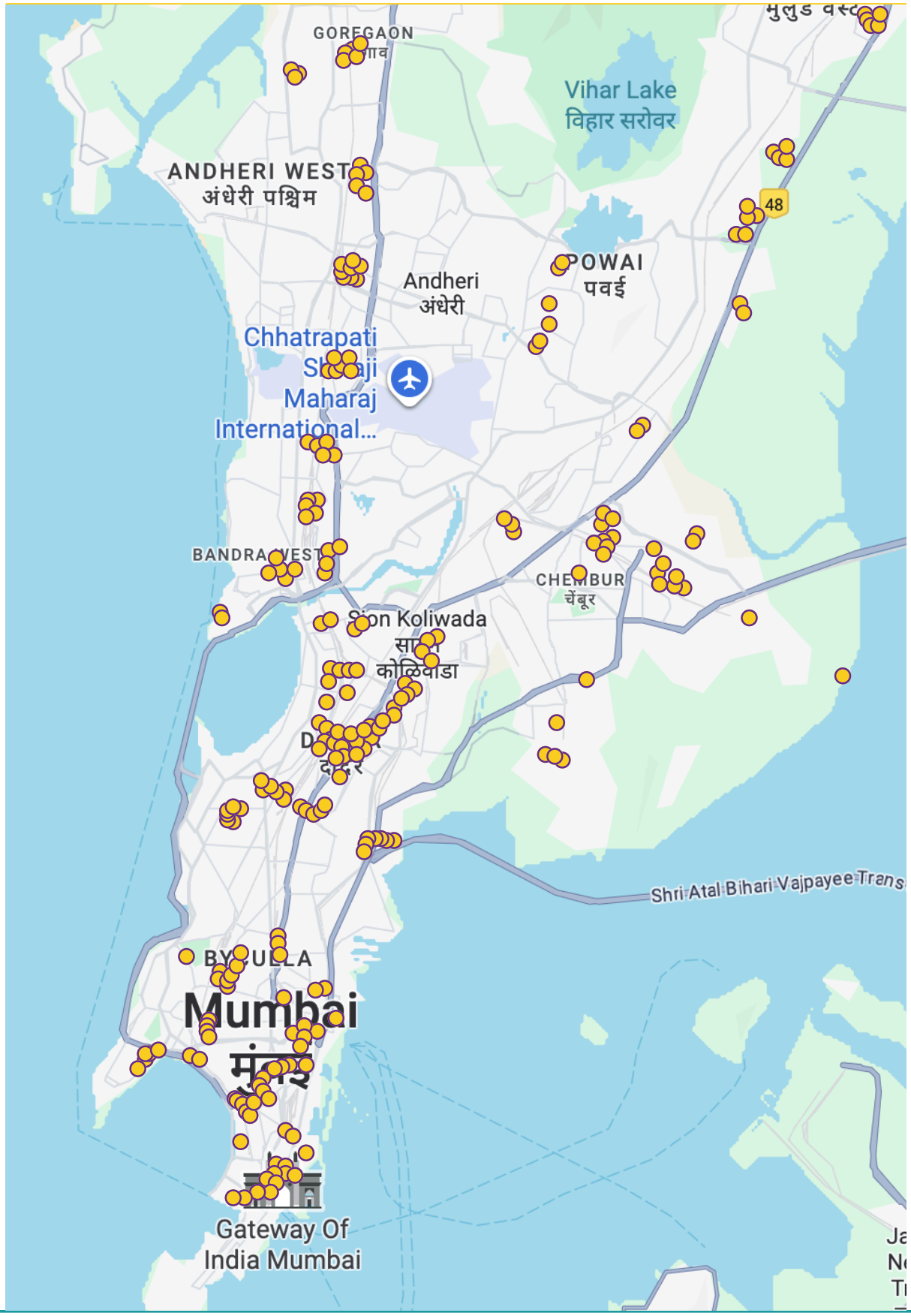
DATA COLLECTION METHOD

Face-to-face interviews were conducted with participants to ensure accurate and detailed responses. The survey included a mix of quantitative and qualitative questions, allowing for both statistical analysis and deeper insights into drivers' experiences and perceptions.

DATA RECORDING AND TOOLS

Responses were recorded digitally using Kobo Toolbox, a reliable platform for data collection and analysis. QGIS (Geographic Information System) was utilized to capture and analyse the spatial location of respondents, providing insights into the geographic distribution of auto and taxi drivers across the city.

STUDY AREA


GOREGAON
Vihar Lake
विहार सरोवर
ANDHERI WEST
अंधेरी पश्चिम
48
POWAI
पवई
Andheri
अंधेरी
Chhatrapati
Maharaj
International...
BANDRA WEST
CHEMBUR
चेंबूर
Sion Koliwada
कोळिवाडा
Shri Atal Bihari Vajpayee Trans
BYCULLA
Mumbai
मुंबई
Gateway Of
India Mumbai

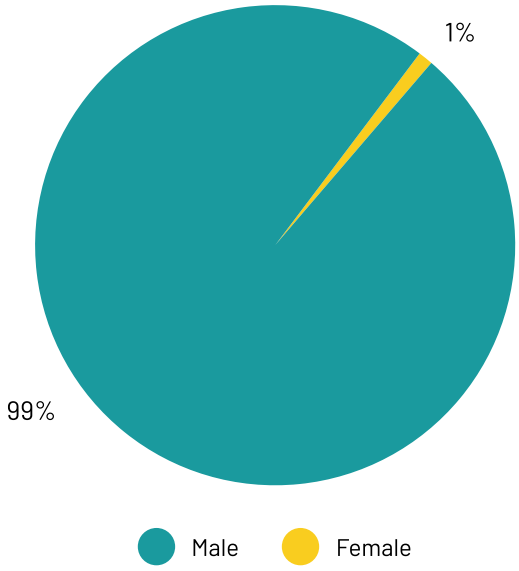
DATA ANALYSIS

PERCEPTION OF AUTO & TAXI DRIVERS OF MUMBAI

The data obtained from the perception of auto and taxi drivers of Mumbai was analysed to understand their preferences and their understanding of EV policies and choice of vehicle for last mile deliveries.

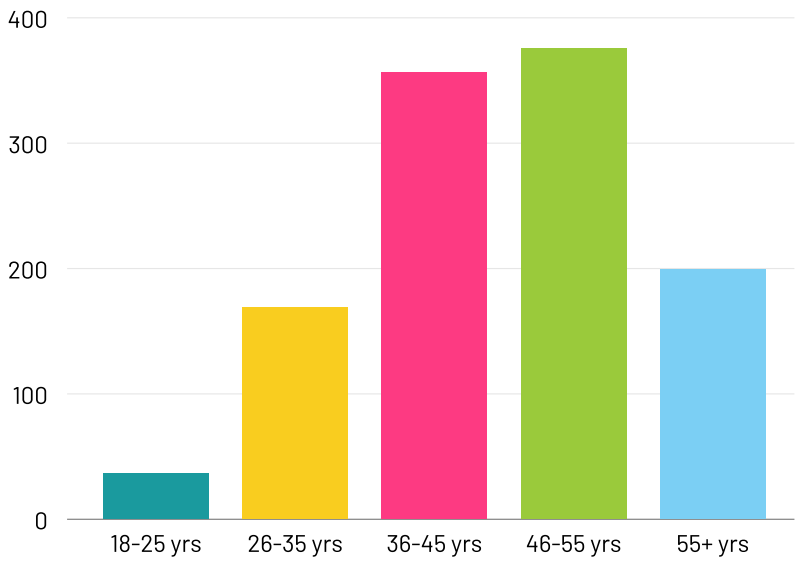
PROFILE OF DRIVERS

1. GENDER OF RESPONDENTS



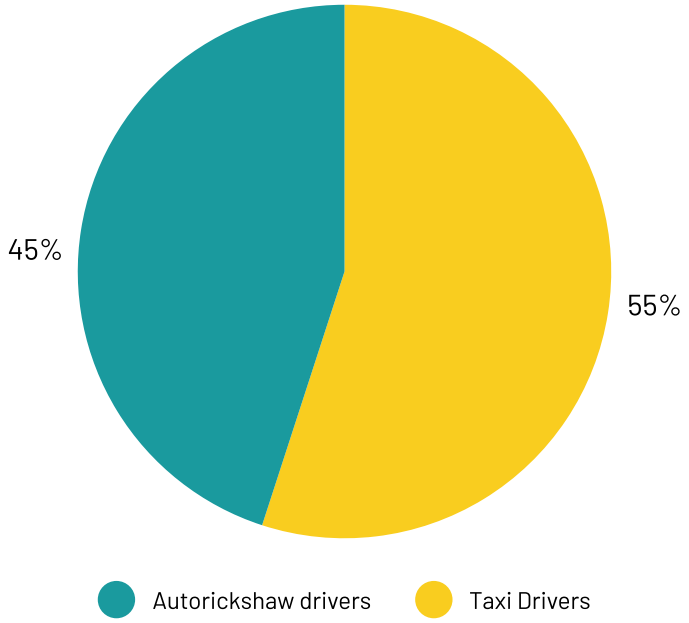
Out of all the 1,200 auto and taxi drivers interviewed, 1190 (99%) are male, while 10 (1%) are female.

2. AGE OF RESPONDENTS



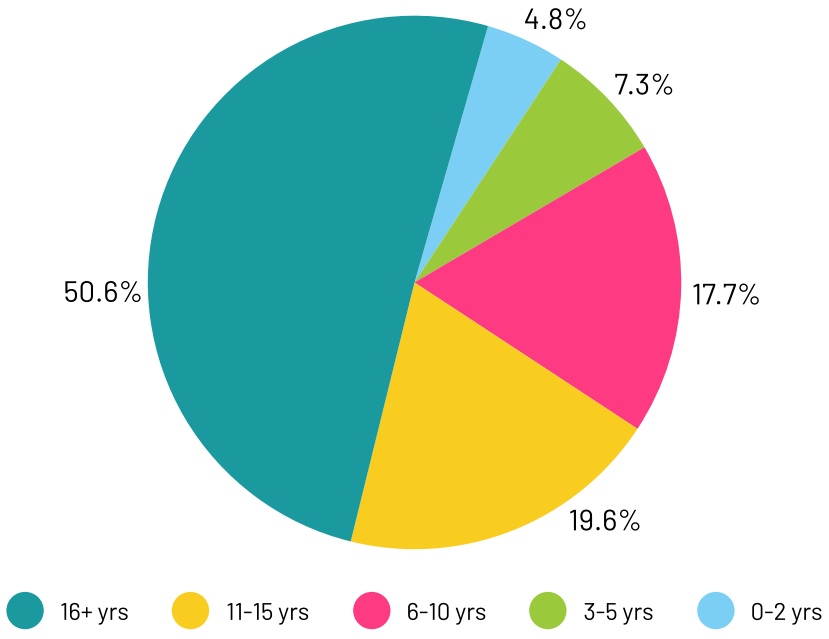
The age of drivers interviewed ranges from 18 to 56+ years. Maximum respondents 33% are in the range of 46 to 55 years followed by 31% in the range of 36 to 45 years.

3. VEHICLE DRIVEN BY DRIVERS INTERVIEWED



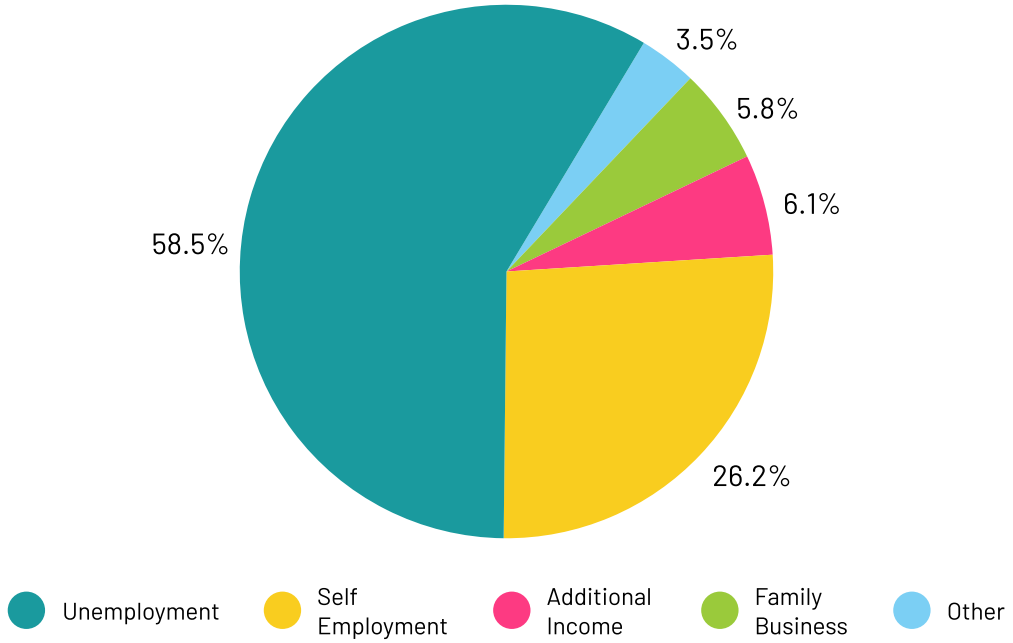
Out of all the 1,200 auto and taxi drivers interviewed, 650 (55%) drive autorickshaws, while 550 (45%) drive taxis.

4. YEARS OF EXPERIENCE AS AUTO / TAXI DRIVER



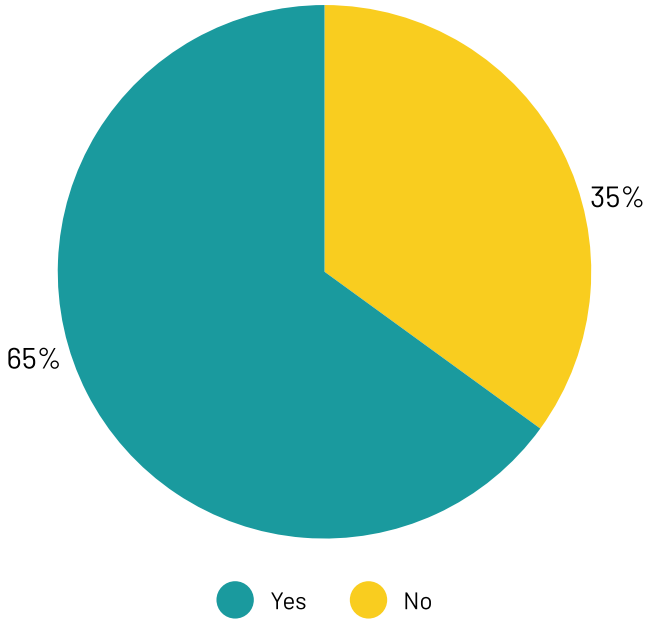
Out of all the 1,200 auto and taxi drivers interviewed, 610 (50.6%) drivers has 16+ years of experience as auto / taxi drivers.

5. REASONS FOR BEING AN AUTO / TAXI DRIVER



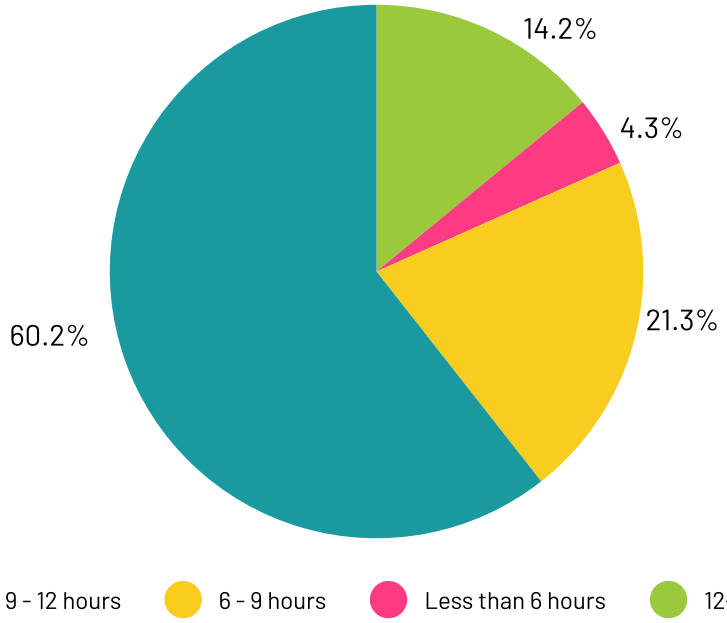
Around 705 (58.5%) auto and taxi drivers chose this profession due to unemployment and 316 (26.2%) did so for self employment.

6. OWNER OF AUTO / TAXI



About 783 (65%) auto and taxi drivers own the vehicle, 423 (35%) drivers rent the autos and taxis for specific period of time.

7. NO. OF HOURS TYPICALLY WORKED IN A DAY



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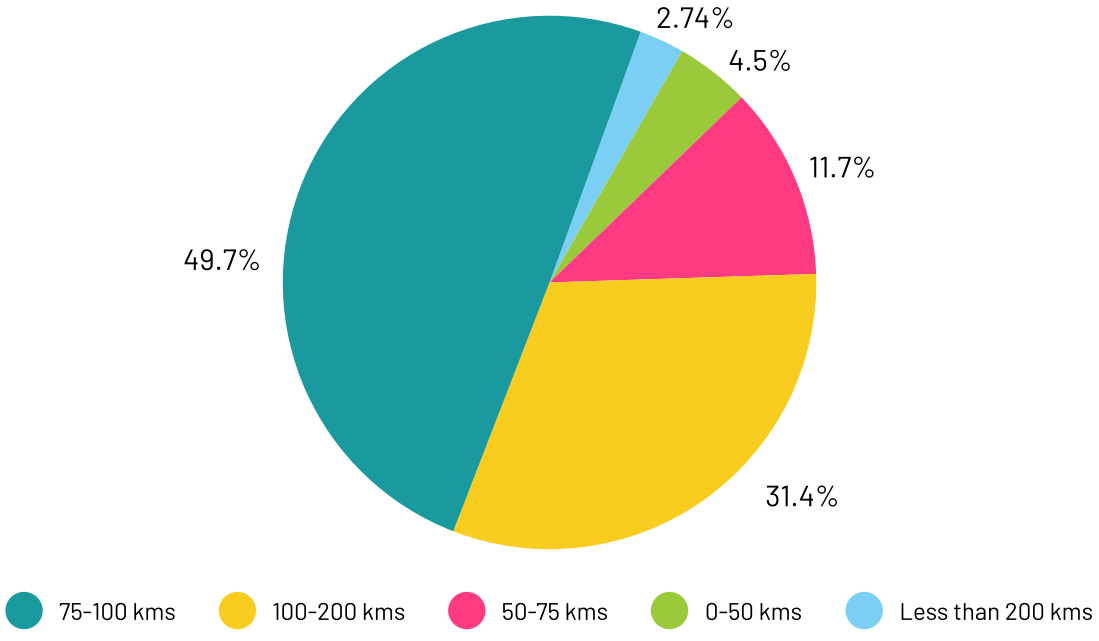
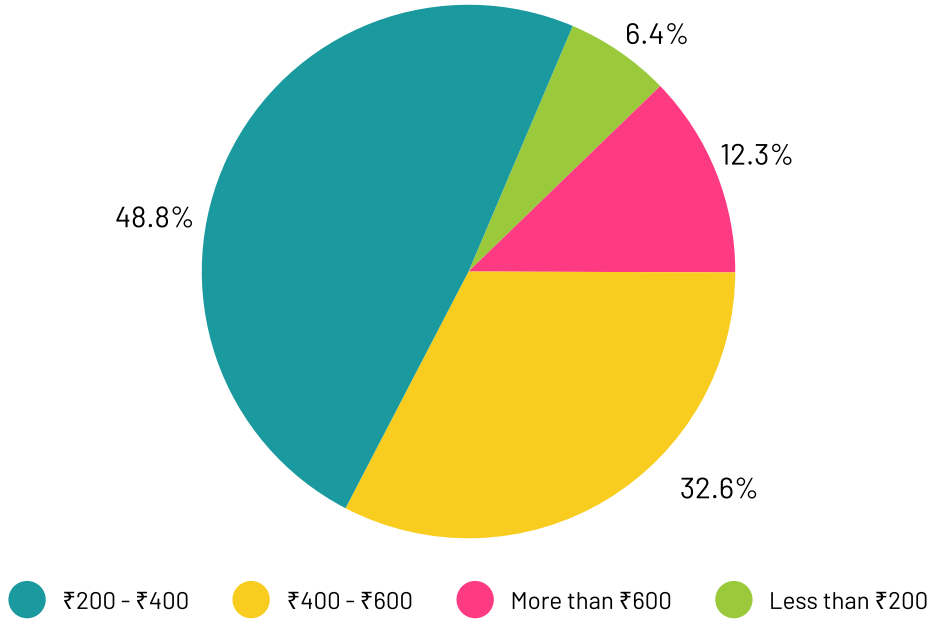
8. KILOMETRES DRIVEN EACH DAY



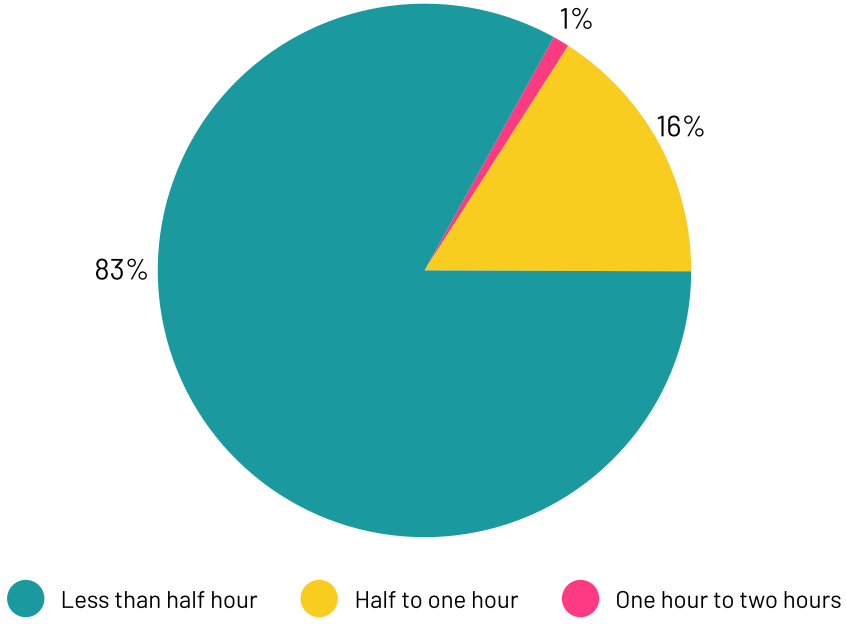
About 599 (49.7%) auto and taxi drivers travel for 75 to 100 kilometres a day, 379 (31.4%) drivers travel 100 to 200 kilometres in a day for their livelihood.

9. COST OF FUEL REFILLED IN A DAY



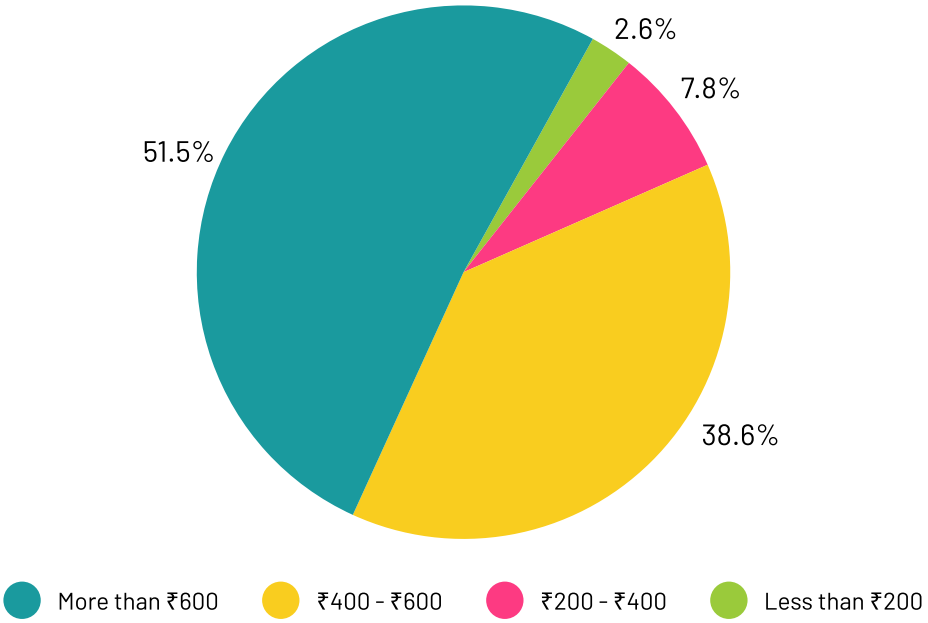
Out of all the 1,200 auto and taxi drivers interviewed, 588 (48.8%) pay Rs. 200 to 400 to refill their vehicles, while 32,6% pay Rs. 400 to 600.

10. TIME REQUIRED TO REFUEL THE VEHICLE



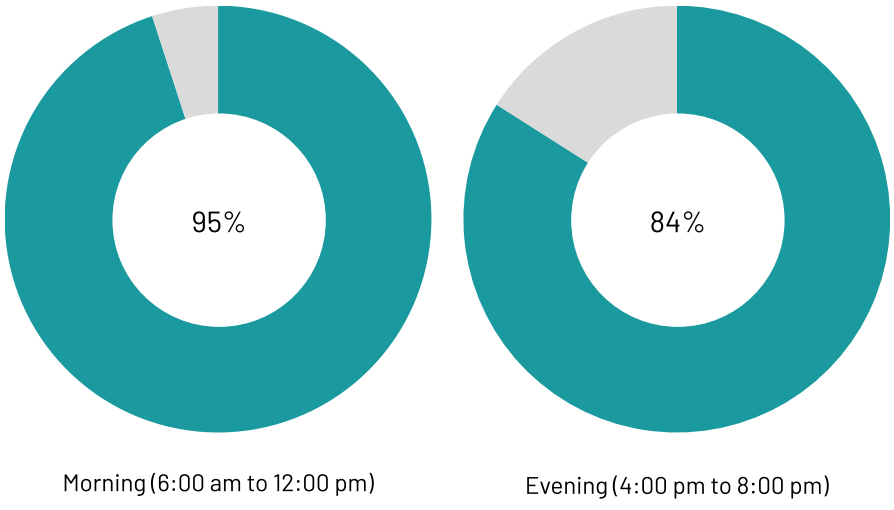
About 1003 (83%) auto and taxi drivers need less than half hour to refuel their vehicles, while 194 (16%) need half to one hour to refuel the vehicles.

11. DAILY EARNINGS AFTER ALL EXPENSES



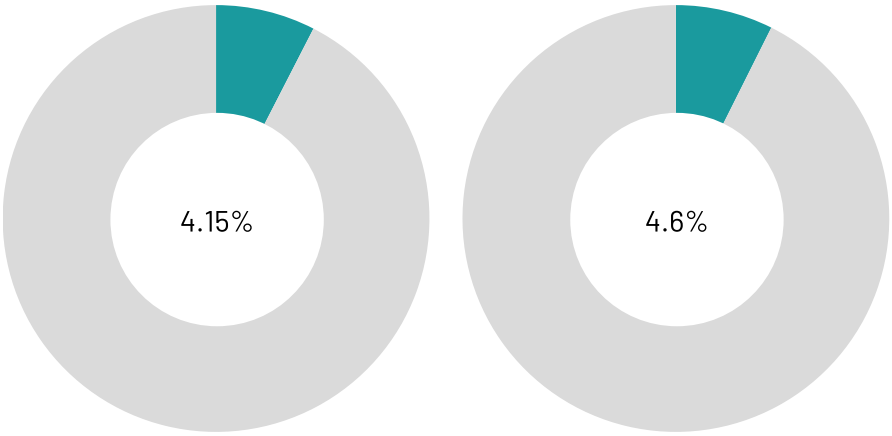
About 621 (51.5%) auto and taxi drivers earn profits more than Rs. 600, while for 485 (38.6%) earn profits between Rs. 400 to 600 in a day.

12A. PEAK HOURS FOR AUTO/TAXI OPERATIONS



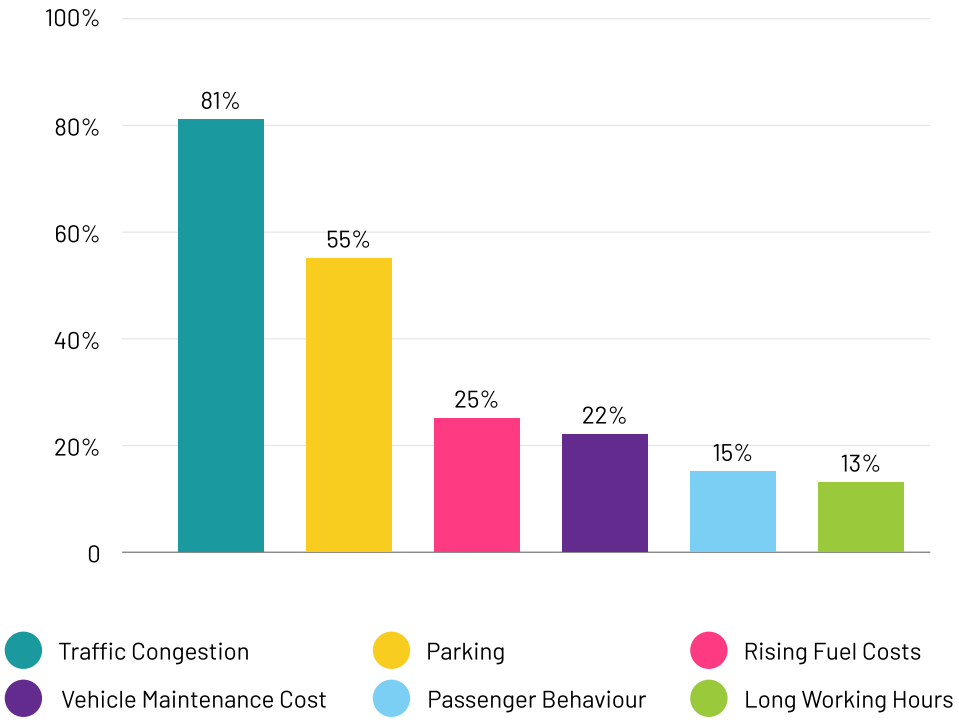
About 1142 (95%) auto and taxi drivers experience peak hours at morning from 6:00 am to 12:00 pm, while also1014 (84%) drivers experience peak hours at evening 4:00 pm to 8:00 pm.

12B. PEAK HOURS FOR AUTO/TAXI OPERATIONS



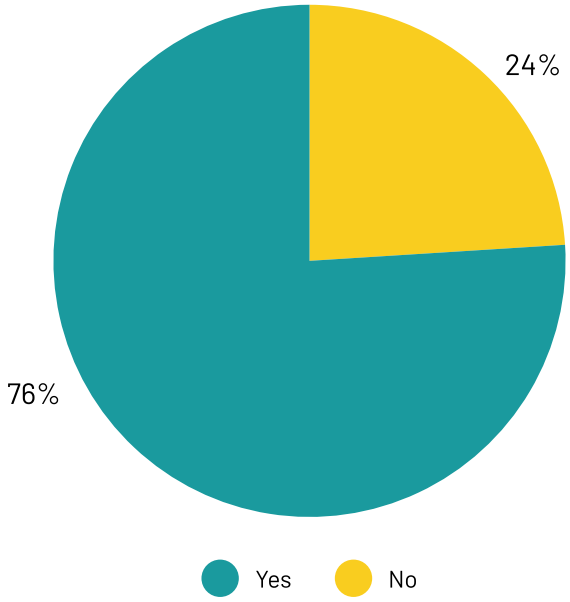
Between afternoon and night, ridership drops to 4.15% and 4.6% respectively

13. CHALLENGES WHILE OPERATING AUTOS AND TAXIS



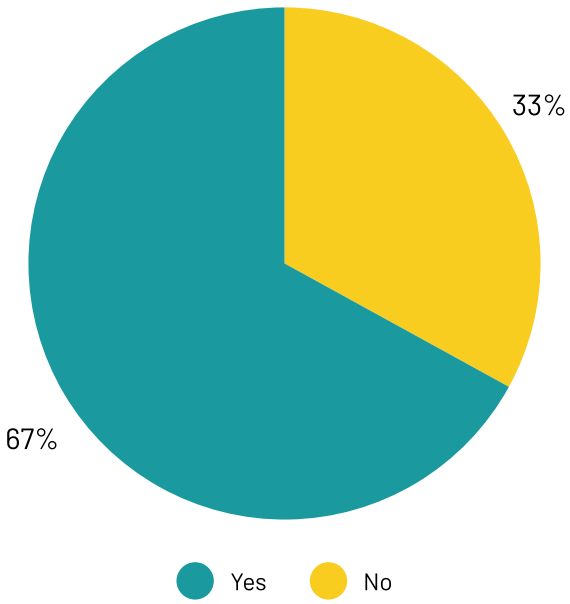
About 974 (81%) auto and taxi drivers consider traffic congestion as a challenge while operating autos and taxis, 666 (55%) feel parking as a challenge.

14. EXPERIENCED ANY HEALTH ISSUE DUE TO PROLONGED EXPOSURE TO VEHICULAR EMISSION



Out of all the 1,200 auto and taxi drivers interviewed, 913 (76%) do not experience any health issue due to prolonged exposure to vehicular emission.

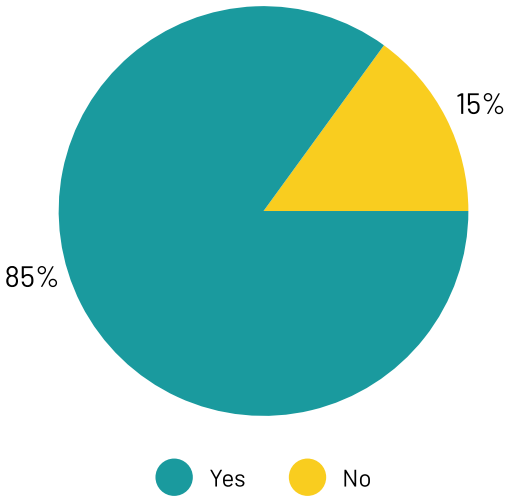
15. EXPERIENCED ANY HEALTH ISSUES DUE TO PROLONGED DRIVING EXPERIENCE



About 394 (33%) auto and taxi drivers face health issues due to prolonged driving experience while 812 (67%) deny any health issues faced.

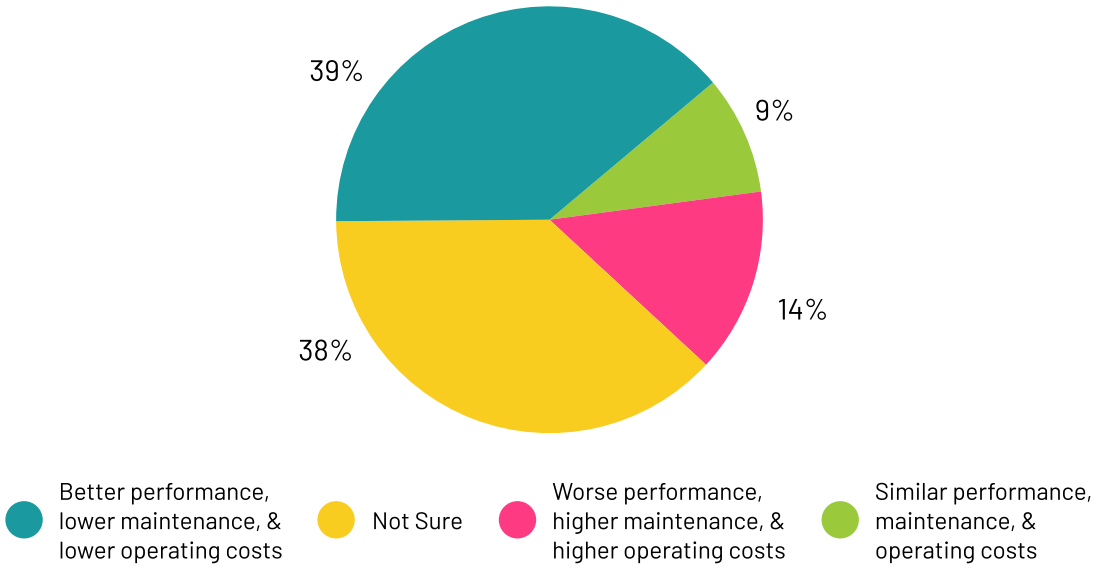
PERCEPTION ABOUT ELECTRIC AUTOS AND TAXIS

16. AWARENESS ABOUT E-AUTOS AND E-TAXIS



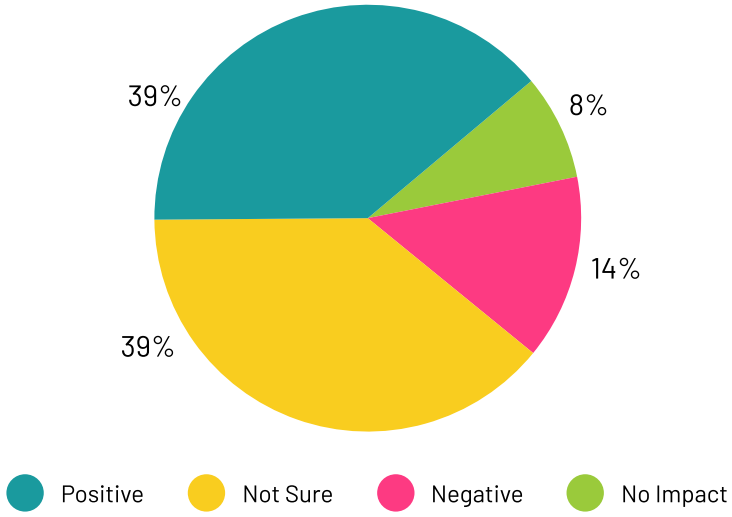
Out of all the 1,200 auto and taxi drivers interviewed, 1028 (85%) drivers are aware of the E Autos and E Taxis running in the city.

17. ABOUT PERFORMANCE, MAINTENANCE AND OPERATING COST



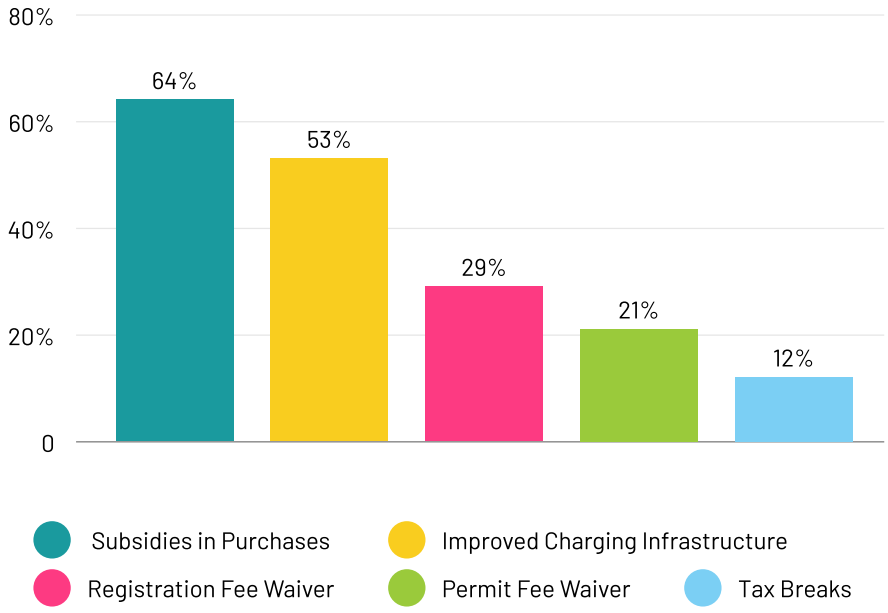
Out of all the 1,200 auto and taxi drivers interviewed, 467 (39%) drivers consider EVs better in performance, lower in maintenance and operating costs, while 457 (38%) are not sure about it.

18. EFFECT ON DAILY EARNINGS AND OVERALL LIVELIHOOD DUE TO TRANSITIONING TO EVs



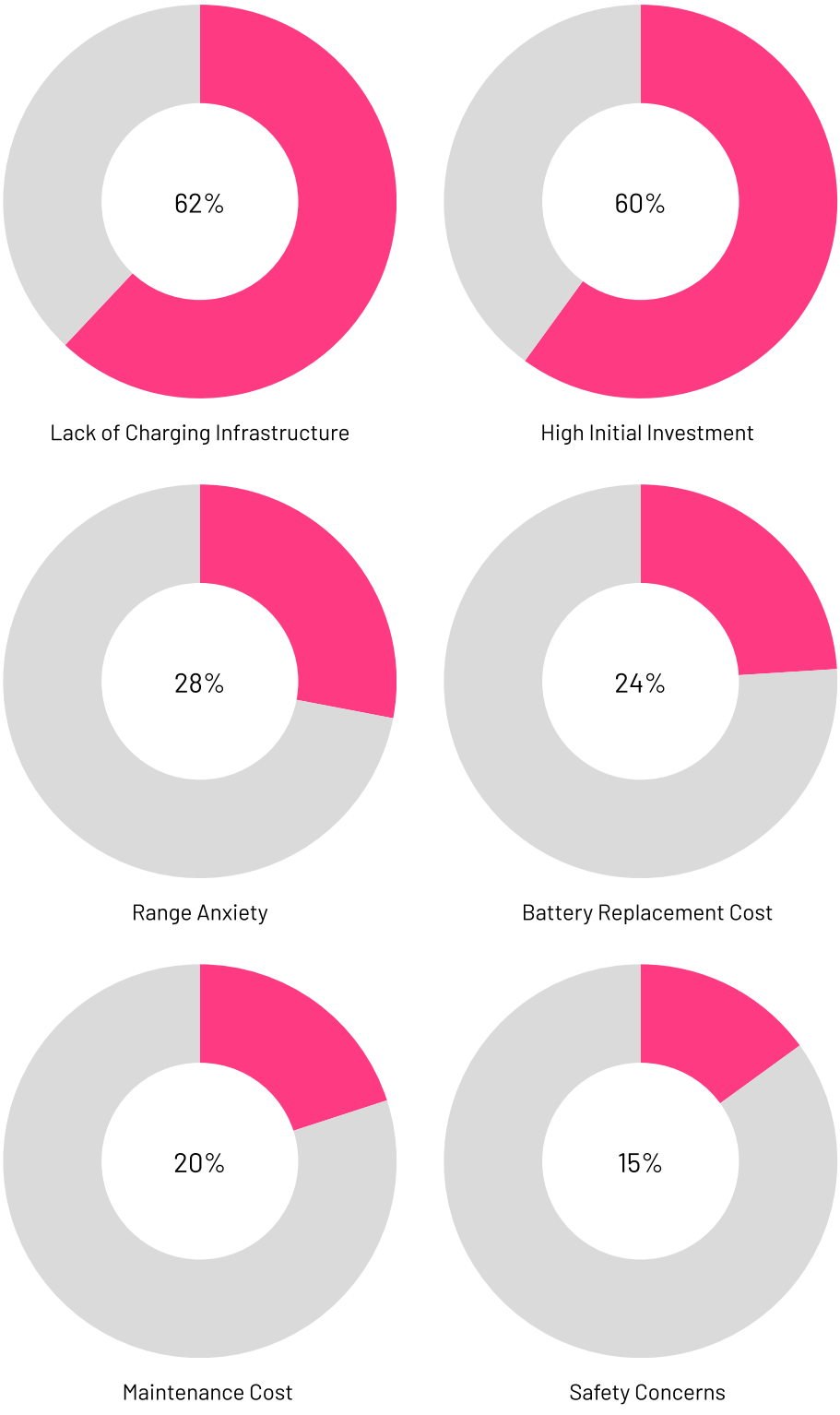
About 467 (39%) auto and taxi drivers think EV transition can positively impact their daily earnings and overall livelihood, while same number of drivers are not sure about the same.

19. SUPPORT OR INCENTIVES TO ENCOURAGE TRANSITION TO EVs



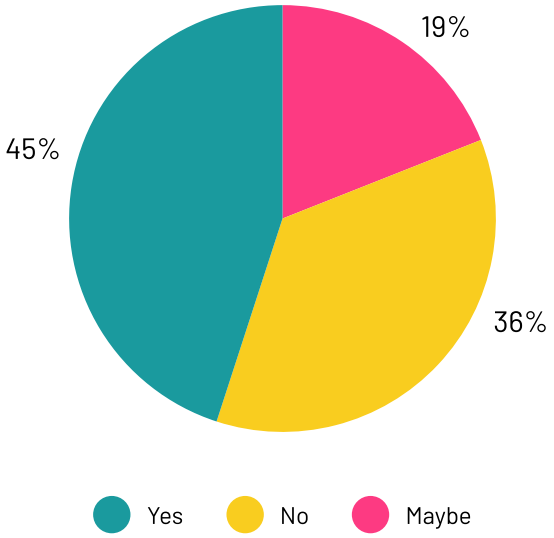
About 775 (64%) auto and taxi drivers wish to get subsidies in purchases, while 634 (53%) demand improved charging infrastructure as steps to encourage transition to EVs.

20. CHALLENGES IN SHIFTING TO ELECTRIC VEHICLES



About 747 (62%) auto and taxi drivers consider lack of charging infrastructure and 721 (60%) consider high initial costs as challenge in shifting to electric vehicles.

21. INTEREST IN PARTICIPATING IN TRAINING PROGRAMMES OR WORKSHOPS AIMED AT FACILITATING THE TRANSITION TO ELECTRIC VEHICLES



Out of all the 1,200 auto and taxi drivers interviewed, 549 (45.5%) drivers have shown interest in participating in training programmes or workshops aimed at facilitating the transition to electric vehicles.

LIMITED EV ADOPTION

AMONG MUMBAI'S AUTO-RICKSHAW & TAXI DRIVERS?

Despite Maharashtra's ambitious electric vehicle policies and various incentives, the transition to electric autos and taxis in Mumbai has been notably slow, with several interconnected factors contributing to this resistance. The most significant barrier remains the financial challenge, where drivers face substantially higher upfront costs for electric vehicles compared to traditional CNG alternatives. While an electric auto rickshaw costs between ₹2.5-3 lakhs, a CNG model is available for ₹1.5-2 lakhs. This price difference proves to be a major deterrent for drivers who typically operate on thin profit margins and often lack access to formal credit systems for financing options.

The infrastructure limitations in Mumbai further compound these challenges. The city's charging network remains inadequate, with insufficient charging stations that are often unevenly distributed across the metropolitan area. The time required for charging, typically 3-4 hours, presents a significant operational challenge compared to the quick refuelling possible with CNG vehicles. This charging time directly translates to lost earning opportunities for drivers who depend on maximising their time on the road.

Technical and operational concerns also play a crucial role in deterring adoption. Many drivers express anxiety about battery life, replacement costs, and performance, particularly during Mumbai's challenging monsoon season. The limited driving range of 100-120 kilometres per charge creates additional stress, especially when compared to the longer range offered by CNG vehicles. The relatively sparse network of EV service centres and the limited availability of trained mechanics for electric vehicle repairs further add to these concerns.

The existing cultural ecosystem around CNG vehicles represents another significant barrier. Many drivers have developed a comfort level with CNG vehicles over years of usage, and there's a natural resistance to adopting new technology. This resistance is particularly strong among older drivers who may find it challenging to adapt to new systems. The well-established CNG infrastructure, including readily available mechanics and spare parts, provides a sense of security that the emerging EV ecosystem has yet to match.

Policy implementation gaps have also hindered adoption. While various subsidies and incentives exist on paper, the actual process of accessing these benefits often involves complex bureaucratic procedures. The lack of clear information about available incentives and limited support during the transition phase makes drivers hesitant to take the leap. Moreover, the absence of widely publicised successful use cases makes it difficult for drivers to envision the benefits of switching to EVs.

To address these challenges, a more comprehensive approach is needed. This should include innovative financing solutions with lower interest rates and simplified subsidy processes, rapid expansion of charging infrastructure with focus on fast charging options, and development of robust support systems including training programs and dedicated service centres. Policy modifications should aim to streamline approval processes and provide additional incentives for early adopters while developing a clear phase-out plan for older vehicles.

The transition to electric autos and taxis in Mumbai requires addressing these multiple challenges simultaneously rather than focusing solely on financial incentives. Success will depend on creating a supportive ecosystem that makes the switch to EVs not just environmentally beneficial but also practically and economically viable for drivers.

CONCLUSION

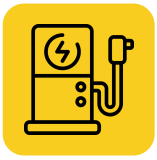
The perception survey revealed that while a majority of auto and taxi drivers expressed a willingness to transition to electric vehicles (EVs), significant challenges persist. One key issue is the ambiguity in their understanding of EV functionality, which creates hesitation. Many drivers also highlighted the lack of adequate parking facilities, as most of them live in slums with no dedicated parking spaces. Additionally, the limited availability of charging infrastructure across Mumbai exacerbates their range anxiety, further discouraging adoption. Concerns about vehicle maintenance also surfaced, with drivers expressing doubts about the accessibility of service centres and the lack of local mechanics trained to repair EVs.

Financial constraints are another major hurdle. Many drivers are already servicing loans for their existing vehicles, making it financially unfeasible to invest in EVs until those debts are cleared. The survey also underscored the drivers' health concerns. Many suffer from chronic backaches, knee problems, and respiratory issues caused by prolonged exposure to pollution. Eye problems, headaches, and, in the long term, conditions like heart disease, high blood pressure, and diabetes are common. These physical and mental health challenges, combined with the burden of excessive traffic fines, further strain their socio-economic standing. Drivers reported losing up to three days' worth of income due to fines, which are often compounded by a lack of clear signage or rules conveyed to them effectively.

A fair and sustainable transition to electric mobility must simultaneously address economic, infrastructural, technical, and informational gaps to make EV adoption economically viable and resilient, socially inclusive, and environmentally beneficial.

WAY FORWARD

Successful EV transition demands collaboration among vehicle manufacturers, battery swapping companies, charging infrastructure providers, and financial institutions. Building multi-stakeholder coalitions can address gaps more effectively.



CHARGING INFRASTRUCTURE

Focus on installing fast-charging stations that can charge vehicles within 30 mins to an hour which will be crucial for drivers who rely on their vehicles for long shifts and quick turnaround times. Develop a network of battery-swap stations where drivers can exchange their depleted batteries for fully charged ones. Establishing a unified national charging network can ensure that Mumbai is integrated into this larger plan.

FINANCIAL ASSISTANCE

As EV does not come under Priority Sector Lending, the government can come up with a scheme to provide low interest loans. Offering tax exemptions or reduced registration fees for e-autos and e-taxis will lower the overall cost of acquiring electric vehicles. Ensure that electric vehicle owners, especially drivers, can access discounted or subsidized rates at public charging stations.

MAINTENANCE PROMOTION

This could include partial reimbursement for routine maintenance services, battery checks, and repair work, making it financially easier to maintain EVs. Provide subsidies or grants to private companies that establish EV repair shops and supply spare parts, ensuring that there is a steady supply of parts for repairs.

EASING THE REGISTRATION

Reduce the bureaucratic hurdles associated with the registration of electric vehicles that includes minimizing documentation requirements, providing clear guidelines, and creating a fast-track registration system specifically for electric autos and taxis. Develop an easy-to-use online portal which allows drivers to complete the entire process digitally, from submitting documents to paying registration fees, making it faster and more accessible.

POLICY FORMULATION

Ensure that policies related to electric vehicles are clear, consistent, and long-term. Provide certainty to drivers, manufacturers, and fleet operators by committing to EV related policies over the next 10-15 years. The lacunae in the existing policies need to be rectified to attract investment from global manufacturers for expanding EV infrastructure that ensure consistency to drivers.

PARKING FACILITATION

The government can set up its own EV-friendly parking lots across high-demand areas, where these lots would be dedicated to electric vehicles and equipped with charging stations, ensuring a guaranteed space for EV drivers. Considering the vulnerability of Slum dwellers, comprehensive solutions have to add to the EV policies.

REPLACEMENT AND RECYCLING PROCESS

Introduce a separate scrapping policy for old conventional vehicles, offering them higher incentives to encourage fleet operators to transition to cleaner alternatives. Allow drivers who scrap old commercial vehicles to receive special EV operating permits, such as reduced inspection fees, priority in securing licenses, or access to exclusive commercial zones for electric vehicles. Encourage the creation of eco friendly vehicle recycling initiatives that not only support the scrapping of old vehicles but also ensure that their components are recycled or reused. This can help reduce waste, create jobs, and improve the overall sustainability of the scrapping process.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