Pune City Electric Vehicle Readiness Plan

April 2022

About Us

About Pune Municipal Corporation

The Pune Municipal Corporation (PMC) is the civic body that governs Pune, the second most populous city in the state of Maharashtra. It is responsible for the civic needs and infrastructure of the metropolis, which covers an area of over 330 square kilometres and has 3.4 million residents. The PMC has been administering Pune and serving its citizens since 1950.

Acknowledgement

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Executive Summary

Cities account for more than 70% of energy-related carbon dioxide (CO_2) emissions globally.[1] Motorised transport represents a major source of these emissions and contributes to local air pollution. In India, cities are set to play a critical role in decarbonising the transport sector by leading the transition to electric vehicles (EVs) by translating national and state policies and priorities into action.

At the national level, the Government of India's Faster Adoption and Manufacturing of Electric Vehicles Scheme, Phase II (FAME II), has allocated INR 10,000 crores (USD 2.4 billion) to fiscal incentives for EVs and EV charging infrastructure. EVs eligible for incentives under FAME II can avoid 7.4 million tonnes of CO_2 emissions over the lifetime of the deployed vehicles.[2] At the state level, 18 states and union territories have notified EV policies and more are in the process of developing them.

In India's largest state economy, the state of Maharashtra, cities are preparing to become leaders of India's EV transition following the notification of the 2021 Maharashtra State EV Policy. The policy sets a target of making EVs contribute to 10% of new vehicle registrations by 2025, provides demand- and supply-side measures to enable adoption, and focuses on establishing six urban agglomerations as early adopters of EVs, including the city of Pune—the second most populous city in Maharashtra.

The city of Pune is working on pathbreaking local initiatives to implement national and state government EV policies on the ground and foster innovation in its electric mobility ecosystem. In October 2021, the civic body that governs Pune, known as the Pune Municipal Corporation (PMC), constituted an "EV cell" to serve as a centralised, structured governance body for facilitating EV ecosystem-related developments in the city and coordinating the actions of government departments, industry, and residents.

To identify and design solutions to accelerate EV adoption in Pune, the Pune EV cell, in collaboration with RMI and RMI India, co-hosted India's first city EV accelerator workshop on December 16, 2021. The workshop brought together more than 100 representatives of government; industry, including original equipment manufacturers (OEMs), charging infrastructure manufacturers and providers, fleet aggregators, and startups; nongovernmental organisations (NGOs); academia; and civil society.

The PMC and Pune EV cell have prepared the Pune City Electric Vehicle Readiness Plan based on outputs of the workshop. The plan is a set of targets and city-level solutions that the public and private sectors will undertake to make the city EV ready across a variety of components (see Exhibit 1).

Exhibit 1

Components of an EV-ready City

The plan focuses on nine solutions (summarised in Exhibit 2) and outlines implementation details for each, including key steps, responsible stakeholders, and timeline.

Exhibit 2 *Summary of EV Readiness Plan Solutions*

Solution Domain	Solutions	Time Frame
EV Charging and Battery Swapping Infrastructure	Single window clearance for the deployment of private charging and battery swapping stations	Short term
	EV charging and battery swapping stations deployment plan	Long term
	Upgrade of upstream infrastructure	Long term
Easing EV Operations	Promotion of electric first- and last-mile connectivity and delivery services	Long term
	Creation of low-emission zones	Short term
Policies and Regulations	Retro-fitting existing vehicles to EVs	Short term
	Setting parking regulations for EVs	Short term
Awareness Programs	EV cell website and city EV dashboard	Short term
	Public awareness campaigns	Long term

Moving forward, the Pune EV cell will focus on implementing these solutions. Successful implementation can support progress towards meeting the plan's proposed target of making EVs contribute to 25% of new vehicle registrations by 2025. Achieving this target can avoid 1.7 million tonnes of CO_2 emissions over the lifetime of the deployed vehicles.[3]

The city of Pune hopes that the Pune City Electric Vehicle Readiness Plan can serve as an example for other cities in India and around the world. It offers a framework, solution set, and concrete steps for a local government to translate national and subnational policies and priorities into action—setting a strong foundation for an all-electric mobility future in the city.

Introduction

Pune City—An Overview

Pune is one of the fastest-growing cities in India, driven by a growing technology sector, a thriving student population, and increasing urbanisation. The city covers 331 square kilometres and has 3.4 million residents.[4] Pune was ranked the most liveable city in the country in India's 2018 Ease of Living Index. However, with rising population and mobility demand, vehicle population and vehicular emissions are growing. Among Indian cities, Pune has the highest rate of two-wheeler ownership (400 per 1,000 residents) and second-highest rate of car ownership (124 per 1,000 residents).[5] The city's transport sector contributed to 46% of fine particulate matter ($PM_{2.5}$) emissions in Pune during 2019–2020.[6]

The Pune Municipal Corporation (PMC) is working on pathbreaking initiatives to guide its urban mobility system towards a low-emissions trajectory. Pune's clean mobility initiatives have earned the city many accolades. The city is one of Maharashtra's 43 Atal Mission for Rejuvenation and Urban Transformation (AMRUT) Cities, through which it has adopted a 10-year carbon neutrality goal and joined the United Nations' Race to Zero.[7] In addition, in 2021 Pune was ranked India's Best Self-Sustainable Big City in the Ministry of Housing and Urban Affairs' Swachh Survekshan ranking and the fifth-cleanest city in the country.[8]

Maharashtra State EV Policy 2021: A Catalyst for EV Adoption in Cities

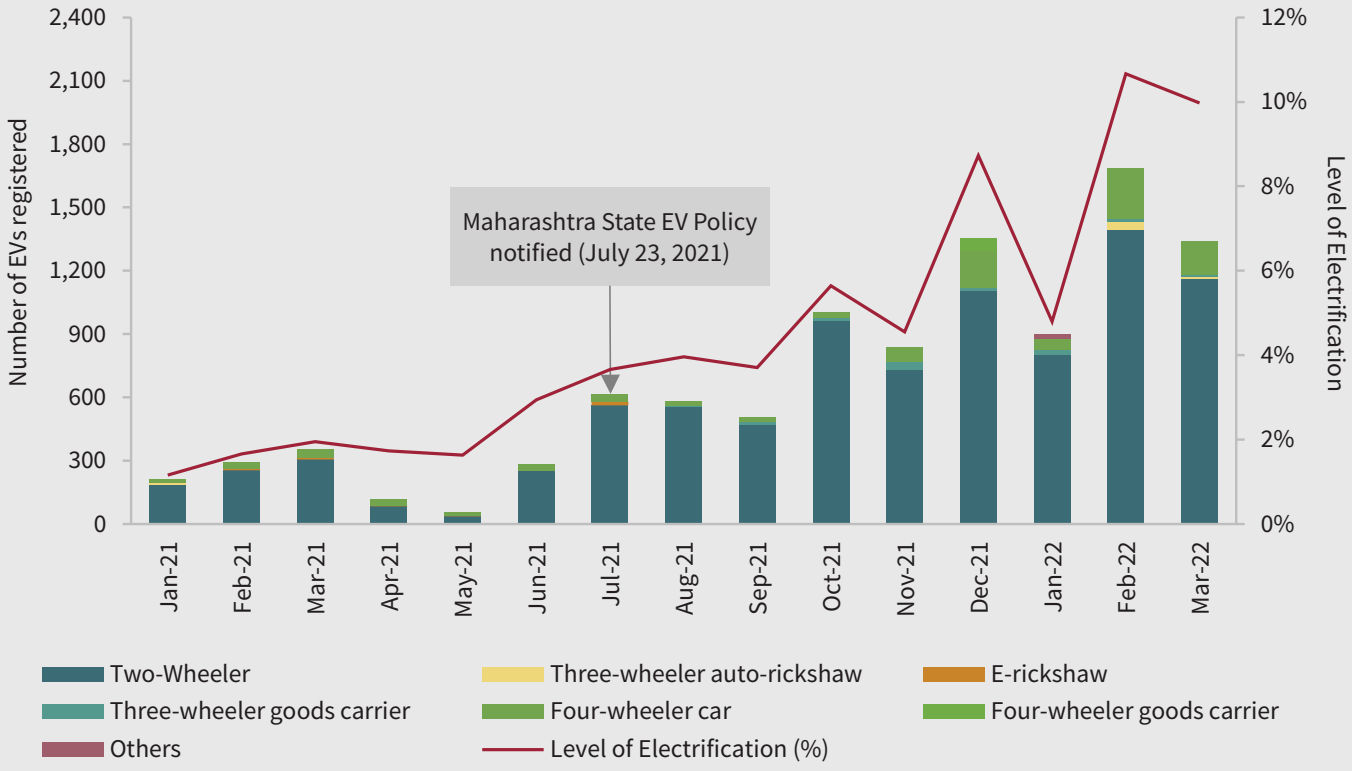
The Government Maharashtra notified its new electric vehicle (EV) policy in July 2021. With an ambition to electrify 10% of the state's new vehicle registrations by 2025, the policy is significant considering the state's position as the leader of India's automotive manufacturing market.[9] The policy identifies the city of Pune as one of six urban agglomerations in the state that will aim to achieve a high rate of EV adoption over the next three years. By 2025, the policy has set ambitious goals of achieving 25% electrification of the city's public transport bus fleet and final-mile delivery vehicles, as well as the installation of 500 public and semi-public charging stations.[10]

Pune City EV Initiatives

The share of EVs among new vehicle registrations in Pune is growing steadily. Each year, Pune registers about 2,00,000 new vehicles.[11] Prior to 2021, the share of EVs among new registrations in Pune was about 1%. This share increased noticeably in 2021 to 3.5%. After the release of the Maharashtra State EV Policy, this increase has been more pronounced, with EVs representing over 10% of new vehicle registrations in February 2022.

Two-wheelers make up the highest share of the city's vehicle registrations at 67%, followed by four-wheelers at 27%. Of the 6,200 EVs registered in 2021, around 90% were two-wheelers and 8% were four-wheelers. Exhibit 3 provides a snapshot of recent monthly EV registrations in Pune and the corresponding EV penetration.

Exhibit 3 *Monthly EV Registration in Pune*



Note: The data runs between January 2021 and March 23, 2022.
Source: Vahan Sewa Dashboard, Ministry of Road Transport and Highways, Government of India

The local city administration, led by the PMC, has been focused on creating a strong EV ecosystem in Pune and making the city a preferred startup development destination. To date, urban local bodies have taken a variety of steps to support vehicle electrification and work towards becoming an EV-ready city. Exhibit 4 details some of the key electric mobility initiatives undertaken by various government departments in the city.

Exhibit 4

Key EV Mobility Initiatives in Pune

Initiative	Govt. Dept.	Description
Electrification of public transport	PMPML	Pune has one of the largest municipal electric bus (e-bus) fleets in the country. Pune Mahanagar Parivahan Mahamandal (PMPML) is the public transport bus service provider for the twin cities of Pune and Pimpri-Chinchwad in the Pune Metropolitan Region. PMPML operates a fleet of 2,169 buses, of which 220 are e-buses. These e-buses have been procured using a gross cost contract model, where PMPML pays a per-kilometre fee to an operator who provides a complete bus service on specific routes. 430 more e-buses will be operating in the fleet by August 2022.
Deployment of electric vehicle charging stations	PMC	Pune has more than 30 operating public charging stations. PMC has issued a tender to install an additional 500 stations in the city. It plans to provide spaces at government-owned lands such as municipal gardens, major roads, and government buildings, and it aims to set up a public-private partnership for installing the stations on a revenue-sharing model.
Government fleet electrification	Vehicle Depot, PMC	PMC has approved a proposal to hire 48 electric cars to kick-start the electrification of its fleet. These leased vehicles will be used to transport government officials in the city. The existing fleet for transportation of government officials is 200 vehicles.
Garbage collection fleet electrification	Vehicle Depot, PMC	PMC plans to kick-start the electrification of its fleet of garbage collection vehicles. It has conducted a pilot on an electric garbage collection vehicle and is strategising the next steps.

Pune City EV Cell

In October 2021, PMC constituted and formally announced a centralised governance body, known as the city EV cell, to facilitate EV ecosystem-related developments and coordinate across government departments, industry, and residents.
Pune's city EV cell is a first-of-its-kind governance structure for EVs in an Indian city.

The following describes the vision, mission, and structure of the EV cell:

Vision: The vision of the EV cell is to carry out functions and tasks that help establish Pune as India's first EV- ready city.[12]

Mission: The mission of the EV cell is to work towards delivering on the ambitious EV targets that the Government of Maharashtra has set for the city of Pune in the Maharashtra State EV Policy 2021.

Structure: The EV cell comprises:

- A steering group that includes high-level decision makers from various city departments.
- A working group responsible for day-to-day operations. The working group is responsible for developing a strategic plan outlining initiatives to accelerate EV adoption, setting up processes for industry to propose projects in the city, and facilitating project implementation.

Exhibits 5 and 6 list the members of the Pune EV cell's steering and working groups.

Exhibit 5

Members of the Steering Group of the EV Cell

Members of the Steering Group
Municipal Commissioner (Chairperson)
Chairman and Managing Director (PMPML)
Director, Works (Maha Metro)
City Engineer (PMC)
Chief Engineer (Maharashtra State Electricity Distribution Company Limited)
Chief Engineer, Roads (PMC)
Chief engineer, Electrical (PMC)

Exhibit 6 *Members of the Working Group of the EV Cell*

Members of the Working Group
Additional municipal commissioner (Estate) (Chairperson)
Deputy commissioner (Head of Department Environment Department, PMC)
Chief Finance and Accounts Officer (PMC)
Chief Engineers (PMPML, Projects, PMC)
Superintending Engineers (Roads, Electrical, Building Permissions, Vehicle Depot, Land and Estate Department, and MSEDCL)
Environment Officer (PMC)
Deputy (Regional Transport Office)
Director (Mahratta Chamber of Commerce, Industries and Agriculture)
Deputy General Manager (Maha Metro)
Chief Knowledge Officer (Pune Smart City Development Corporation Limited)
Experts (Automotive Research Association of India, Central Institute of Road Transport, technical advisor on air pollution)

The EV cell aims to identify funding sources to support electric mobility initiatives and projects. It also plans to provide a help desk to Pune residents to handle requests for information and grievances.

Pune City EV Accelerator Workshop

On December 16, 2021, PMC, in collaboration with RMI and RMI India, hosted the Pune City EV Accelerator Workshop to fast-track EV adoption in Pune. Over 100 stakeholders participated, representing the civic administration; industry, including original equipment manufacturers (OEMs), charging infrastructure manufacturers and providers, fleet aggregators, and startups; NGOs; academia; and civil society.

During the workshop, the city government showcased ongoing electric mobility initiatives and encouraged key industry stakeholders to share their recommendations. Discussions covered topics such as charging infrastructure, urban freight, first- and last-mile connectivity, and governance and awareness campaigns.

PMC shared its vision and roadmap for the newly established city EV cell. Shri Aaditya Thackeray—Cabinet Minister for Environment, Tourism, and Protocol for the Government of Maharashtra—participated in the workshop and reiterated the state's climate agenda.

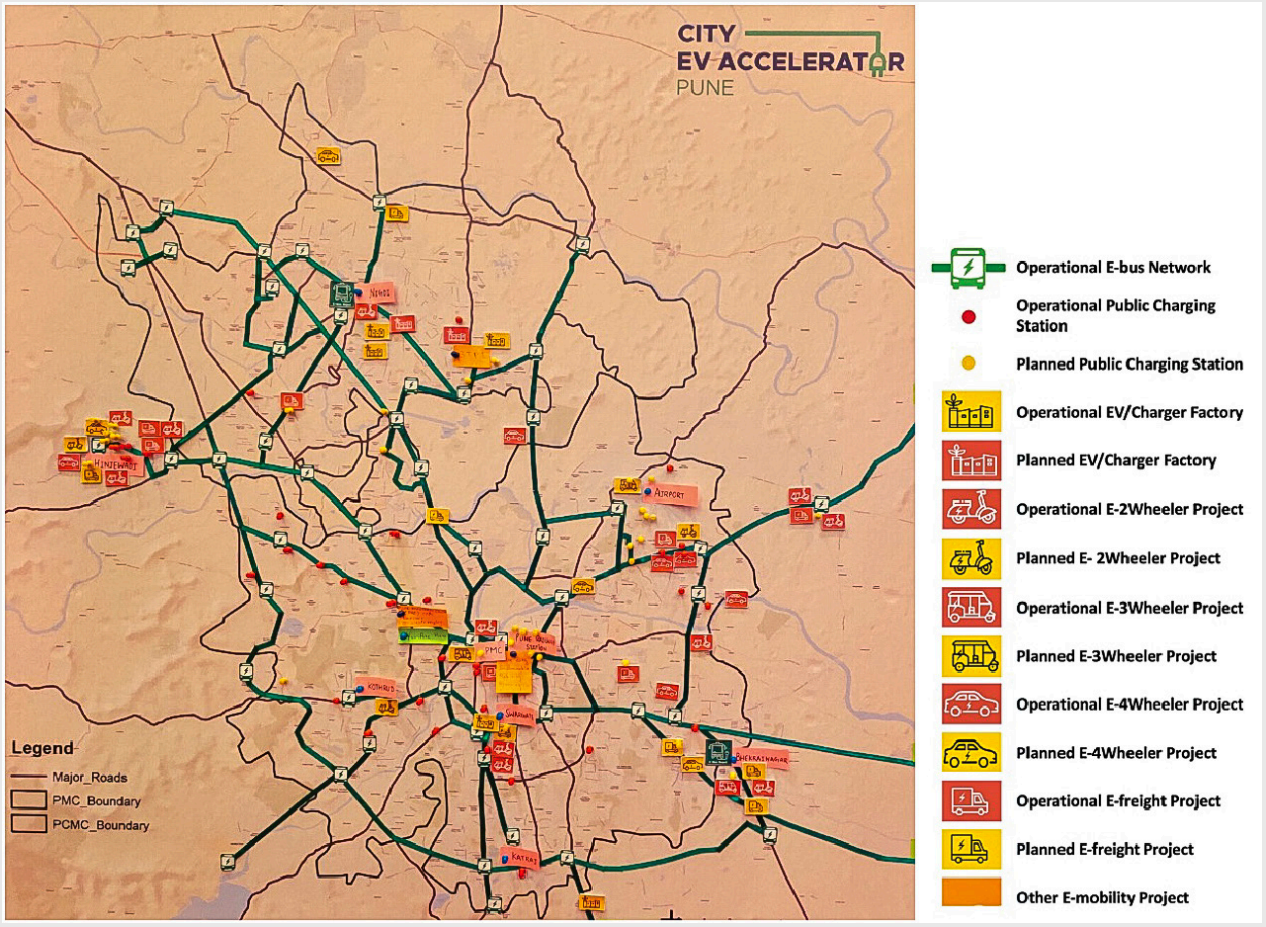
'Through the City EV Accelerator initiative, Pune's vision of redefining its mobility system is sure to become a reality. Pune's EV cell model will in fact need to be replicated in all cities so we can meet our EV adoption targets.'

Shri Aaditya Thackeray, Cabinet Minister for Environment, Tourism, and Protocol for the Government of Maharashtra, and Guardian Minister for the Mumbai Suburbs

The workshop catalysed the development of an EV readiness plan for the city of Pune. Delegates shared their feedback and suggestions on Pune's current electric mobility initiatives, then identified and developed a set of new solutions to make the city EV-ready. Exhibit 7 illustrates areas with high concentrations of EV project development, as well as gaps in the city's EV ecosystem.

Exhibit 7

Map of the Ongoing and Planned EV Ecosystem of Pune



EV Readiness Plan for the City of Pune

The city of Pune, in consultation with RMI and RMI India, has defined an EV-ready city as one that creates a favourable ecosystem for seamless, mass adoption of EVs by all consumers and users (i.e., residents, institutions, and businesses). Exhibit 8 outlines the core components of an EV-ready city.

Exhibit 8

Components of an EV-ready City

The Pune City EV Readiness Plan is a set of targets and city-level initiatives that the public and private sectors will undertake to realise the components of an EV-ready city in the near term. The plan's short- and long-term actions—including infrastructure projects, policy and regulatory reforms, institutional and governance structures, and awareness and skill-building programs—can help the city accelerate EV adoption.

City EV Adoption Targets

Under the Pune City EV Readiness Plan, the city EV cell has set preliminary EV adoption targets. The city aims for EVs to make up 25% of all new vehicle registrations by 2025 across all vehicle segments. Penetrations for specific vehicle segments range from 35% for two-wheelers to 10% for four-wheelers. Exhibit 9 shows the complete list of city EV adoption targets.

Exhibit 9 *Electrification Targets for Pune City*

Serial No.	Vehicle Segment	Pune EV Readiness Plan Targets		
		Per cent of EVs in Total Number of New Vehicle Registrations in 2025	Number of New EVs Registered in 2025	Cumulative Number of EVs Registered in Pune 2022–2025
1	All vehicles	25%	50,000	1,00,000
2	2-wheelers	35%	43,000	89,000
3	3-wheelers, passenger	25%	100	500
4	3-wheelers, goods	25%	1,500	2,500
5	4-wheelers, passenger	10%	4,500	7,500
6	4-wheelers, goods	10%	400	500

Meeting Pune's EV adoption targets could result in the addition of 1,00,000 EVs in the city in the next four years, which could avoid 1.7 million tonnes of CO_2 emissions over the lifetime of the vehicles.[13]

In addition, the Pune city EV cell has also identified the following targets:

- Requiring fleet aggregators (i.e., e-commerce companies, last-mile delivery/ logistics players, and mobility aggregators) to convert at least 15% of their total fleet to EVs by 2023 and 50% by 2025
- Procuring at least 650 e-buses in Pune by 2023 and 1,000 e-buses by 2025
- Installing at least 250 public/semi-public charging stations in the city by 2023 and 600 by 2025
- Establishing 500 public/semi-public battery swapping stations across the city by 2025
- Achieving 50% electrification in first- and last-mile connectivity to metro stations by 2025
- Electrifying all new government vehicles in Pune
- Making at least 50% of city government office parking spaces EV ready by 2023
- Integrating electric mobility planning into the city's Development Plan
- Providing property tax rebates to residential owners who install their own private charging stations

Pune estimates a total of 2,00,000 new vehicle registrations in 2025.[14] Assuming the current distribution of vehicle registration remains similar between 2022 and 2025, the share of two-, three-, and four-wheelers would be 67%, 5%, and 27%, respectively. Compared with the Maharashtra State EV Policy 2021, Pune's city-specific targets are ambitious. The state aims to achieve an EV penetration rate of 10% across all vehicle segments and 10%, 20%, and 5% for two-, three-, and four-wheelers, respectively. This accelerated rate of adoption is possible in Pune as the city has a higher share of two-wheelers, which offer a strong economic case for electrification. In Maharashtra, electric two-wheelers for personal use can present 60% lower total cost of ownership (TCO) and achieve upfront cost parity after government incentives.

City-level Solutions for EV Readiness

To achieve Pune's targets, all the major stakeholders of the EV ecosystem will have to work together on the EV readiness plan. The plan is based on multiple stakeholder consultations and convenings as well as learnings from national and international best practices. It identifies nine actions that government stakeholders, with support from industry, should undertake over the next one to two years to transition Pune into an EV-ready city. Exhibit 10 provides a summary of the actions identified in the EV readiness plan.

Exhibit 10 *Summary of EV Readiness Plan Solutions*

Solution Domain	Solution No.	Solution	Time Frame
EV Charging and Battery Swapping Infrastructure	1	Single window clearance for the deployment of private charging and battery swapping stations	Short term
	2	EV charging and battery swapping stations deployment plan	Long term
	3	Upgrade of upstream infrastructure	Long term
Easing EV Operations	4	Promotion of electric first- and last-mile connectivity and delivery services	Long term
	5	Creation of low-emission zones	Short term
Policies and Regulations	6	Retro-fitting existing vehicles to EVs	Short term
	7	Setting parking regulations for EVs	Short term
Awareness Programs	8	EV cell website and city EV dashboard	Short term
	9	Public awareness campaigns	Long term

The nine solutions were identified by the stakeholders that participated in the Pune City EV Accelerator Workshop organised by the Pune city EV cell, with the support of RMI and RMI India, on December 16, 2021. The Pune City EV Readiness Plan categorises these solutions into short- and long-term solutions. Short-term solutions are solutions that can potentially be designed and implemented in less than six months, while long-term solutions will generally require more than six months.

Deployment of EV Charging and Battery Swapping Infrastructure

Three key solutions have been identified to accelerate the deployment of charging and battery swapping infrastructure in Pune

1. **Single window clearance for the deployment of private and captive charging and battery swapping stations**
2. **Deployment plan for EV charging and battery swapping stations**
3. **Upgrade of upstream infrastructure**

1. Single window clearance for the deployment of private and captive charging and battery swapping stations

i. **Description:** Single window clearance is a unified system to collect all required information and coordinate approvals for faster deployment of private and captive (i.e., single fleet) charging and battery swapping infrastructure. The nodal agency for charging and battery swapping infrastructure, MSEDCL, would identify and empanel EV infrastructure providers, list all approved charging and battery swapping station models, standardise and centralise all required documents and information, and establish and post timelines for customer interconnection requests for charging stations.

ii. **Benefits:** The single window clearance will accelerate the deployment of EV charging and swapping stations in the city. The visibility of all Ministry of Power approved charging station models on the MSEDCL website and the ability to place an order from the same site will ease the process of setting up private and captive charging stations for residents and industry, respectively. The process will allow MSEDCL to track the development of charging and swapping networks over time and help them plan required upgrades to upstream charging infrastructure. The process will also help the city EV cell track the number of charging and swapping stations in the city.

Exhibit 11 *Detailed Steps for Single Window Clearance Deployment*

Solution	Steps	Stakeholders	Timeline
Single Window Clearance	1. Convene a meeting with MSEDCL	EV cell, MSEDCL	T + 4 weeks
	2. Design a single window portal on the MSEDCL website	EV cell, MSEDCL	T + 9 weeks
	3. Create a demo video for the public on how to use the single window portal	EV cell, MSEDCL, IT Department	T + 10 weeks
	4. Refine the portal based on user feedback	EV cell, MSEDCL	T + 12 weeks
	5. Update the EV dashboard monthly with the number of chargers installed	EV cell, MSEDCL	Continuous

2. EV charging and battery swapping stations deployment plan

i. **Description:** The Maharashtra State EV Policy mandates that urban local bodies prepare a charging infrastructure plan to determine the number, type, and location of charging and battery swapping stations required for the city's 2025 expected EV penetration. The plan must also discuss deployment considerations. The Pune City EV Readiness Plan aims to identify and deploy at least 600 public charging and 500 public battery swapping stations by 2025.

ii. **Benefits:** The charging infrastructure and battery swapping plan will provide a structured approach for identifying the numbers, type, and locations of the public charging and battery swapping infrastructure deployment that aligns with EV growth trends and encourages consumer EV adoption and use over time. The plan will address driver and rider's range anxiety concerns. It will also help the city administration proactively plan for resource and funding requirements.

Exhibit 12 *Detailed Steps for EV Charging and Battery Swapping Plan Deployment*

Solution	Steps	Stakeholders	Timeline
EV charging and battery swapping plan	1. Estimate projected EV penetration for the year	EV cell, Regional Transport Office (RTO), industry players	T + 2 weeks
	2. Identify the type and number of chargers required	EV cell, MSEDCL, industry players	T + 4 weeks
	3. Identify locations and land parcels (including at existing fuel stations) from government and land-owning agencies that could be made available for charging infrastructure installation through concessional rentals	EV cell, MSEDCL, PMC	T + 11 weeks
	4. Identify all stakeholders and facilitate discussion of the plan	EV cell, MSEDCL, industry players	T + 15 weeks
	5. Create public-private partnerships, tenders, and next steps based on stakeholder consultations	EV cell, Electrical Department, PMC, industry players	T + 18 weeks

3. Upgrade of upstream infrastructure

i. **Description:** Rising EV adoption will increase the grid-connected electricity load, especially in areas with higher levels of adoption and/or vehicles with higher loads (e.g., e-buses). To prepare for this additional load, Pune aims to develop a map of areas that may require upgraded transformers, distribution lines, and other infrastructure, as well as a plan and schedule for making such investments.

ii. **Benefits:** The primary benefit of upgrading the upstream infrastructure will be to ease the deployment of charging infrastructure in priority hubs. The timely upgrade of upstream infrastructure will also ensure reliable supply of power in these areas of the city.

Exhibit 13 *Detailed steps for upgrading upstream infrastructure*

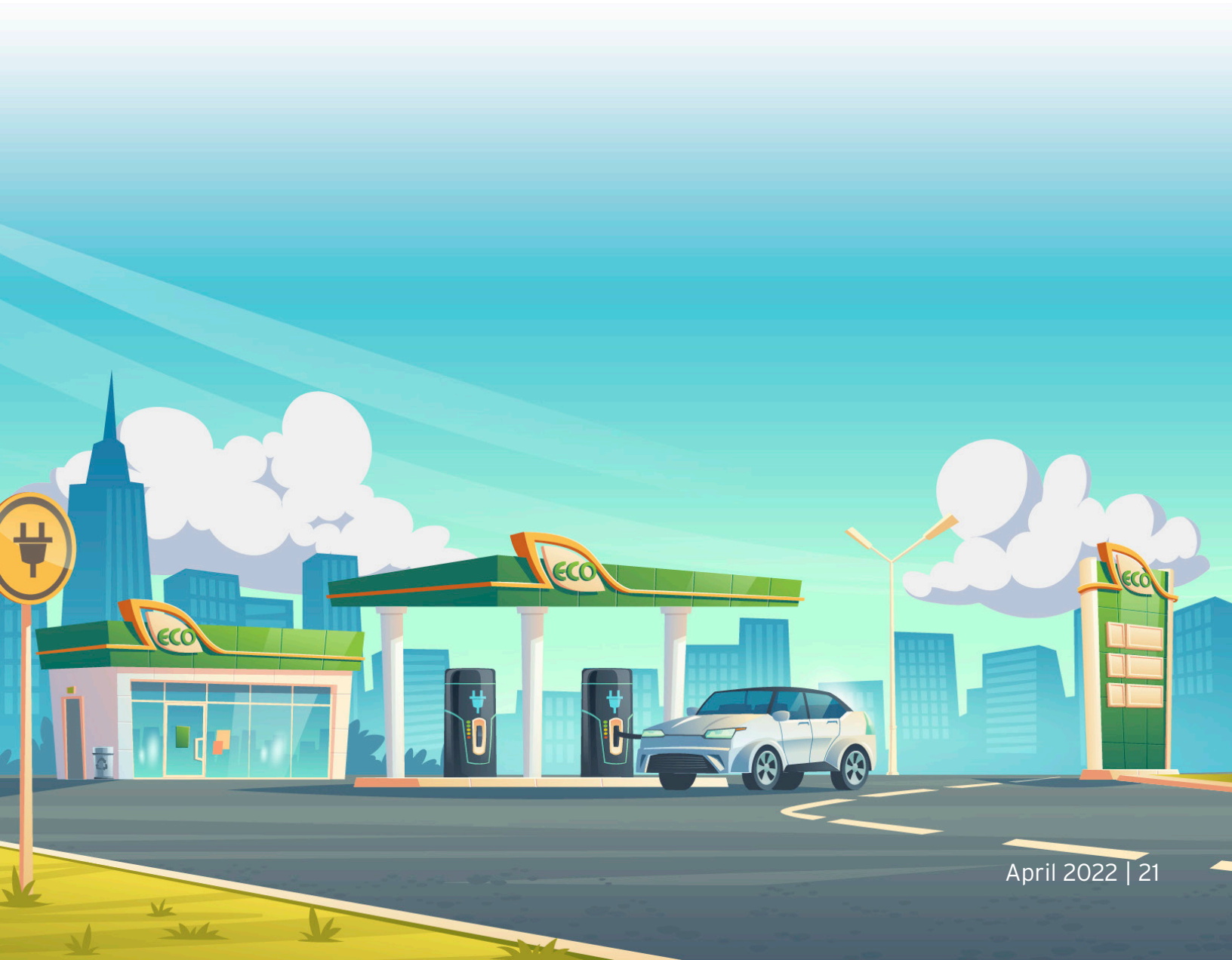
Solution	Steps	Stakeholders	Timeline
Upstream infrastructure upgrade	1. Identification of hubs and locations where energy demand is growing or expected to grow	EV cell, MSEDCL, Electrical Department, PMC, industry players	TT + 4 weeks
	2. Estimating increase in peak load in these hubs	EV cell, MSEDCL	T + 6 weeks
	3. Land allocation for substation/ switching centre	EV cell, Land and Estate Department, PMC, MSEDCL	T + 21 weeks
	4. Switching centre setup	EV cell, MSEDCL	T + 27 weeks
	5. High tension lines setup	EV cell, MSEDCL	T + 33 weeks

It is recommended that MSEDCL repeat this exercise periodically.

Easing EV Operations in the City

Two key solutions have been identified to provide priority to EVs over internal combustion engine (ICE) vehicles and make them easier and more attractive to operate or use:

4. **Promotion of electric first- and last-mile connectivity and delivery services**
5. **Creation of low-emission zones**



4. Promotion of electric first- and last-mile connectivity and delivery services

i. **Description:** E-bike rental and e-bike taxis are new, innovative solutions that have emerged in first- and last-mile connectivity and delivery services. A clear differentiation of such vehicles from privately owned vehicles will ease their deployment in this domain. Commercial registration of these electric two-wheeler vehicles will facilitate the building of a strong foundation for clean and sustainable shared mobility and help achieve the state EV policy targets for the city. PMC plans to provide fiscal and non-fiscal incentives to accelerate the adoption of electric vehicles in first- and last-mile connectivity and delivery services in near future. PMC also shall work with Metro and PMPML to plan and promote the development of the charging and battery swapping infrastructure for the faster adoption of EVs in this space.

ii. **Benefits:** Electrification of two-wheeler rental services will promote shared, reliable, and clean first- and last-mile connectivity in Pune. It also has the potential to help boost public transport ridership over a longer period.

Exhibit 14 *Detailed Steps for Promotion of First- and Last-Mile Connectivity and Delivery Services*

Solution	Steps	Stakeholders	Timeline
Promotion of electric first- and last-mile connectivity and delivery services	1. EV cell meeting to discuss permitting commercial registration and rental services of electric two-wheelers	EV cell, RTO	T + 3–4 weeks
	2. Notification from RTO permitting the registration	EV cell, RTO, Road Department (PMC)	T + 2 weeks
	3. Identifying locations for shared, clean first- and last-mile services	EV cell, PMPML, Maha Metro, industry players	T + 3–4 weeks
	4. Developing charging infrastructure required for these vehicles	EV cell, MSEDCL, PMPML, Maha Metro stations, industry players	Continuous
	5. Deployment of first- and last-mile projects	Industry players	Continuous

5. Creation of low-emission zones

i. **Description:** Low-emission zones (LEZs) are areas with restrictions on the operation of ICE vehicles. Low-emission zones are a component of a portfolio of solutions being implemented by leading cities around the world to tackle vehicular pollution, emissions, and congestion.[15] In a typical LEZ, higher emission vehicles are restricted from entering or are charged a fee to enter, while pedestrians, cyclists, low-emission vehicles, and vehicles meeting other criteria (e.g., shared mobility) are free to enter. The Maharashtra State EV Policy also encourages the Urban Development Department and urban local bodies to develop and implement LEZs.

ii. **Benefits:** LEZs promote the adoption and use of cleaner modes of transport by providing operational benefits to walkers, cyclists, EVs, and shared mobility. They can also protect public health by improving local air quality in specific areas of the city.

Exhibit 15 *Detailed Steps for Creation of Low-Emission Zones in the City*

Solution	Steps	Stakeholders	Timeline
Low-emission zones in the city	1. Planning for low-emission zones through consultations	EV cell	T + 4 weeks
	2. Identifying locations for implementing low-emission zones	EV cell	T + 8 weeks
	3. Notification of the LEZ	EV cell, RTO, Urban Development Department (PMC), Traffic Police	T + 10 weeks
	4. Developing regulations and enforcement	EV cell, RTO	T + 14 weeks

It is recommended that the city administration repeat this exercise every 6–12 months.

Policies and Regulations

Two key policy and regulatory solutions have been identified to promote the transition to EVs in Pune:

6. **Retrofitting existing vehicles to EVs**

7. **Setting parking regulations for EVs**

6. Retrofitting existing vehicles to EVs

i. **Description:** EV retrofitting is a process of converting vehicles fuelled by petrol, diesel, or compressed natural gas into EVs. It involves switching the original engine and other related components with a new alternative energy source in the vehicle body—either by adding a new system to the existing motor or completely replacing the engine with a new motor and drivetrain. All other components remain the same, which may make it easier to replace or repair parts, including suspension, brakes, and headlights. Retrofitting the vehicle involves two major costs: for the retrofit kit and for the battery.

ii. **Benefits:** Retrofitting can be more affordable than purchasing a new EV. For vehicle segments like autorickshaws and final-mile delivery vehicles, retrofitting can reduce the upfront cost barrier to electrification. This can make a compelling economic case when combined with the low fuel and maintenance costs of electric autorickshaws and final-mile delivery vehicles.

Exhibit 16 *Detailed Steps for Retrofitting Existing Vehicles to EVs*

Solution	Steps	Stakeholders	Timeline
Retrofitting existing vehicles to EVs	1. Certification requirements for retrofit kits	EV cell, Automotive Research Association of India	T + 2 weeks
	2. Incentives to promote retrofitting of existing vehicles	EV cell, Environment Department, PMC	T + 4 weeks
	3. Incentive disbursement mechanism to end users	EV cell, Finance Department (PMC)	T + 6 weeks
	4. Tracking of the incentive delivery and sales numbers of retrofit kits	EV cell, RTO	Continuous

7. Setting parking regulations for EVs

i. **Description:** Preferential parking regulations have potential to promote EV adoption by providing greater access and affordability to EV users. Such regulations include reserved, off-street parking spaces for EVs; changing building byelaws to mandate the provision of EV-ready parking spaces; and providing concessional parking rates for EVs at public parking spaces.

ii. **Benefits:** Parking in urban areas can be challenging, and providing necessary parking spaces, concessional parking rates, and/or EV-ready parking spaces can encourage drivers and riders to switch to EVs. Incorporating such parking regulations in building byelaws can ensure that EV charging infrastructure is included in new constructions, both residential and commercial.

Exhibit 17 *Detailed Steps for Setting Parking Regulations for EVs*

Solution	Steps	Stakeholders	Timeline
Parking regulations for EVs	1. Publicise the parking regulations suggested in the Maharashtra State EV Policy 2021	EV cell, Building Permission Department (PMC)	T + 2 weeks
	2. Identify public and semi-public parking spots for notifying the public of the updated parking regulations	EV cell, Projects Department (PMC)	T + 3 week
	3. Add amendments to residential and commercial building byelaws for facilitating EV parking	EV cell, Building Permission Department (PMC)	T + 6 weeks
	4. Notify the public of the amendments to the byelaws	EV cell, Building Permission Department (PMC)	T + 8 weeks

Awareness Programs

The Pune City EV Readiness Plan aims to mainstream public awareness about EVs and their benefits by proposing two key solutions:

8. **EV cell website and city EV dashboard**

9. **Pune EV awareness program**

8. EV cell website and city EV dashboard

i. **Description:** The PMC is developing a dedicated city EV cell website, which will act as a knowledge hub and a way to address residents' requests for information and complaints. The website will include the organisational structure of the city EV cell, information on EV sales in the city, incentives available to EV buyers, and comparison of total cost of ownership of EVs and ICE vehicles. A dashboard will also provide a detailed visual representation of the progress of Pune's EV ecosystem.

ii. **Benefits:** The dedicated website will serve as a one-stop place for residents to find information regarding Pune's EV ecosystem. It will also help them addressed their concerns through a help desk. In addition, the dashboard will make residents aware of the locations of EV services and EV charging stations, as well as the benefits of EVs, including cost and carbon emissions savings.

Exhibit 18 *Detailed Steps for EV Cell Website and EV Dashboard*

Solution	Steps	Stakeholders	Timeline
EV cell website and city EV dashboard	1. Website content design	EV cell, PMC	T + 3 weeks
	2. Website creation	IT Department, PMC	T + 6 weeks
	3. Website goes live	IT Department, PMC	T + 6 weeks
	4. New EV registration data integration with RTO	EV cell, RTO	T + 9 weeks
	5. City map integration for locations of charging stations	EV cell, IT Department, MSEDCL	T + 11 weeks
	6. EV dashboard launch	EV cell, IT Department	T + 12 weeks
	7. Data monitoring and update	EV cell, MSEDCL, RTO	Continuous

9. Pune EV awareness program

i. **Description:** The Pune Municipal Corporation plans to organise regular EV awareness programs for various EV consumers, such as private two-wheeler and four-wheeler buyers, and commercial three-wheeler and four-wheeler drivers, operators, and aggregators. The EV awareness program will also include continuous engagement with a broad set of stakeholders to implement the city EV readiness plan.

ii. **Benefits:** Public awareness and education can help expand the understanding of the technological readiness of EVs, as well as their economic and environmental benefits. Also, public awareness programs can help inform businesses and residents about national, state, and local incentives and regulations that make EVs more economical and easier to operate in the city. Lastly, it will help collect and understand of hyperlocal considerations and concerns for EV adoption through surveys and stakeholder consultations, enabling the city EV cell to adjust its plan and implement it more effectively.

Exhibit 19 *Detailed Steps for Pune Awareness Campaign Program*

Solution	Steps	Stakeholders	Timeline
Pune EV awareness program	1. Develop a quarterly EV awareness program framework	EV cell, think tanks	TT + 4 weeks
	2. Develop an EV awareness survey on the EV dashboard	EV cell	T + 8 weeks
	3. Organise biannual stakeholder consultation meetings	EV cell, think tanks	T + 12 weeks
	4. Conduct annual user and nonuser perception surveys on adoption of EVs	EV cell, think tanks	T + 6 weeks
	5. Promote awareness of EVs through advertisements on billboards, radio channels, and television	EV cell, think tanks	T + 6 weeks
	6. Participate in global, national, and state competitions to mobilise funds, gain recognition for initiatives, and build Pune as a lighthouse city on EV ecosystem development	EV cell, think tanks	T + 26 weeks

Implementation and Path Forward

Moving forward, the Pune EV cell will focus on implementing these nine solutions. The Pune City EV Readiness Plan outlines the steps that can help Pune operationalise them and work towards developing a sustainable EV ecosystem for residents, institutions, and industry.

The following are key next steps that the EV cell will be focusing on:

1. Enabling the formation of a city-level EV department to work on implementation of the solutions and steps outlined in the Pune City EV Readiness Plan
2. Developing an EV readiness tracking framework to assess the state of implementation of these solutions in the short and long terms
3. Benchmarking Pune's EV readiness with other Indian and international cities to learn about and develop other innovative measures to further accelerate EV adoption in Pune
4. Identifying and allocating funding from the annual budget and other sources to form a city EV fund under the PMC to financially support the implementation local projects and activities, including potential viability gap funding
5. Updating the set of solutions in the plan on an annual basis

By offering a framework, solution set, and concrete steps to help make a city EV ready, the city of Pune hopes that the Pune City Electric Vehicle Readiness Plan can serve inspiration for other cities in India and around the world—and thereby accelerate EV adoption and transport decarbonisation in Pune and beyond.

Endnotes

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