ELECTRIC MOBILITY

POLICY WORKBOOK

Smart City
MISSION TRANSFORM-NATION

Ministry of Housing and Urban Affairs
Government of India

ROCKY MOUNTAIN INSTITUTE

Ministry of Housing and Urban Affairs
Government of India

ABOUT MINISTRY OF HOUSING AND URBAN AFFAIRS (MoHUA)

The Ministry of Housing and Urban Affairs is the apex authority of Government of India to formulate policies, coordinate the activities of various central ministries, state governments and other nodal authorities and monitor programs related to issues of housing and urban affairs in the country. The Smart Cities Mission was launched by the Ministry in 2015 to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.

ABOUT ROCKY MOUNTAIN INSTITUTE (RMI)

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing. RMI has been supporting India's mobility and energy transformation since 2016.

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Document outline

As India continues to experience rapid urbanization, managing urban environmental quality will be critical to ensure well-being. Considering severe air quality concerns and rising GHG emissions, clean mobility solutions such as electric mobility are gaining traction in urban centers around the world. Indian cities have been no different. As has been discussed in the framework document, many Indian cities are piloting electric mobility technologies with the aim at further scaling the uptake of this technology.

This document is the second in line among the series of documents under the electric mobility component. The previous framework document presents a knowledge base on India. The current workbook document is designed to support cities in implementing electric mobility solutions. The workbook will introduce various steps required for identifying strategies and implementing plans for promoting electric mobility in respective cities. This document will specifically help city managers in:

- Assessing the current status of their cities in terms of EV uptake
- Drawing institutional framework for planning and implementing e-mobility in their cities
- Identifying measures and strategies through which the city will be able to approach/ promote electrification in transportation sector
- Suggesting how cities can implement the identified measures and strategies

To help assess the aforementioned, the document is structured in the following parts

1.0 Benchmarking current status 06

2.0 Institution framework for planning and implementing e-mobility 14

3.0 Planning for electric mobility in the city 17

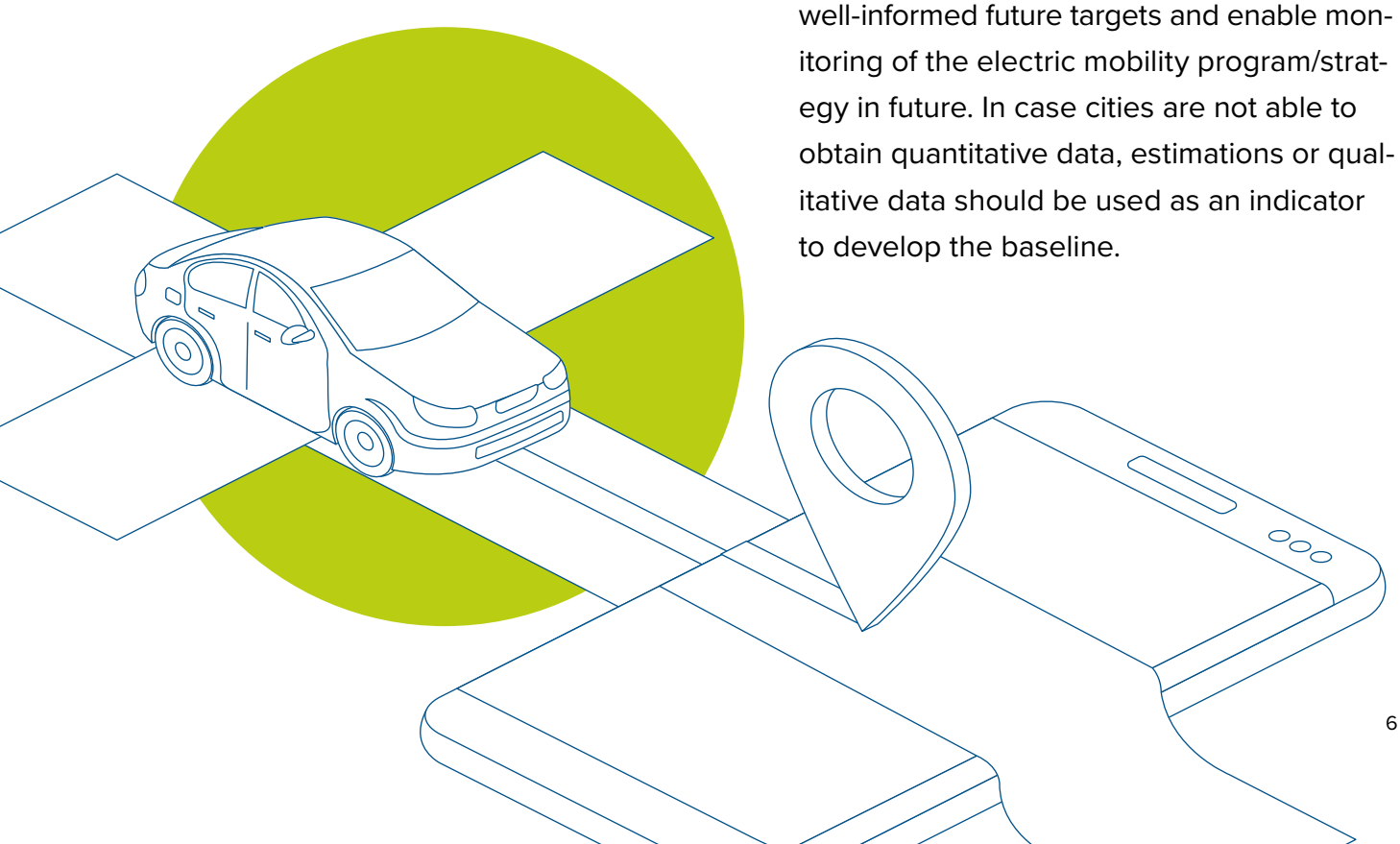
4.0 Project implementation 41

1.0 Benchmarking current status

The first step towards promoting e-mobility in the city is to understand the current status of the city in terms of EV penetration, charging infrastructure and city-level e-mobility policies /initiatives.

This step will help the city managers assess where the city stands in terms of e-mobility. The city manager is encouraged to measure all the parameters listed in the table to develop a baseline. It may not be possible to collect exact empirical data with respect to each of the suggested parameters. It is, however, suggested that the cities collect as much data as possible.

This will help create a strong baseline, develop well-informed future targets and enable monitoring of the electric mobility program/strategy in future. In case cities are not able to obtain quantitative data, estimations or qualitative data should be used as an indicator to develop the baseline.



Number of EVs in the city:

Parameters

Buses » Mini buses » Standard

Baseline year

» Actual numbers/estimated numbers/operational network length/passenger km

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs

Number of EVs in the city:

Parameters

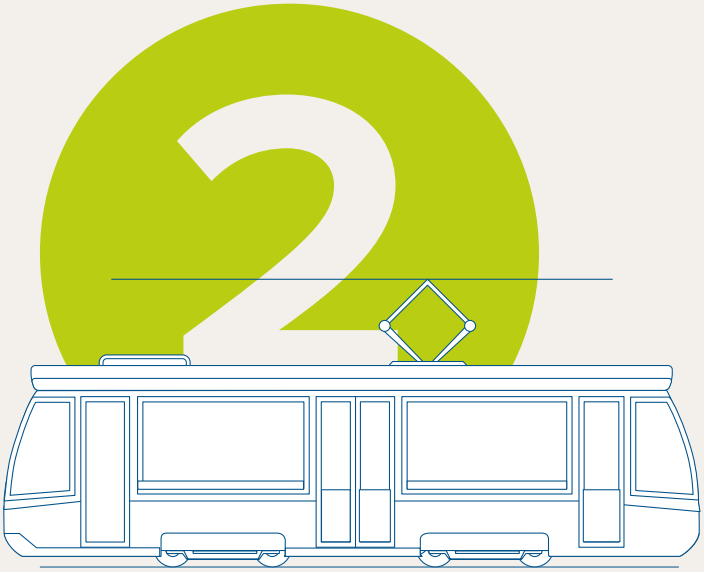
» Rail

Baseline year

» Actual numbers/estimated numbers/operational network length/passenger km

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs



Number of EVs in the city:

Parameters

Intermediate public transport » E-rickshaws » E-auto-rickshaws[1] » E-taxis » Any other

Baseline year

» Actual numbers/estimated numbers/operational network length/passenger km

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs

Number of EVs in the city:

Parameters

Personal vehicles » E-cars » LCVs » E-2-wheelers[2]: low speed (below 25kmph)[3] and medium/high speed (above 25kmph) » E-bicycles[4]

Baseline year

» Actual numbers/estimated numbers/operational network length/passenger km

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs

Number of EVs in the city:

Parameters

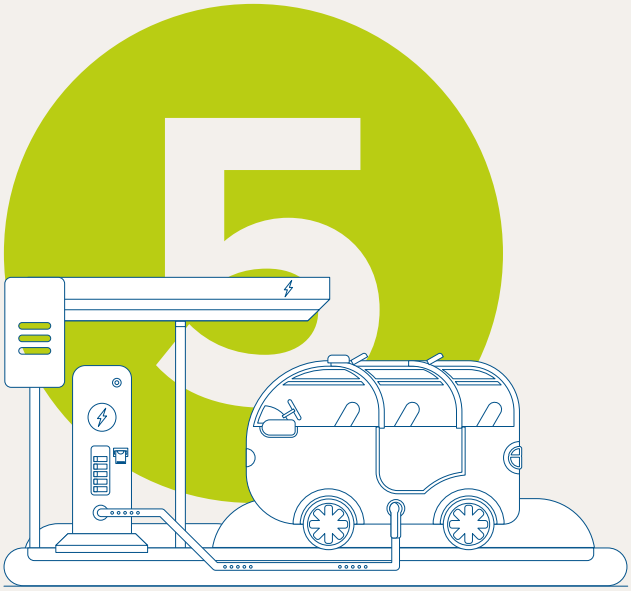
Commercial vehicles » LCVs » HCVs

Baseline year

» Actual numbers/estimated numbers/qualitative indicators

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs



Number of EVs in the city:

Parameters

Personal vehicles » E-cars

Baseline year

» Actual numbers/estimated numbers/operational network length/passenger km

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs

Number of electric fleet operators:

Parameters

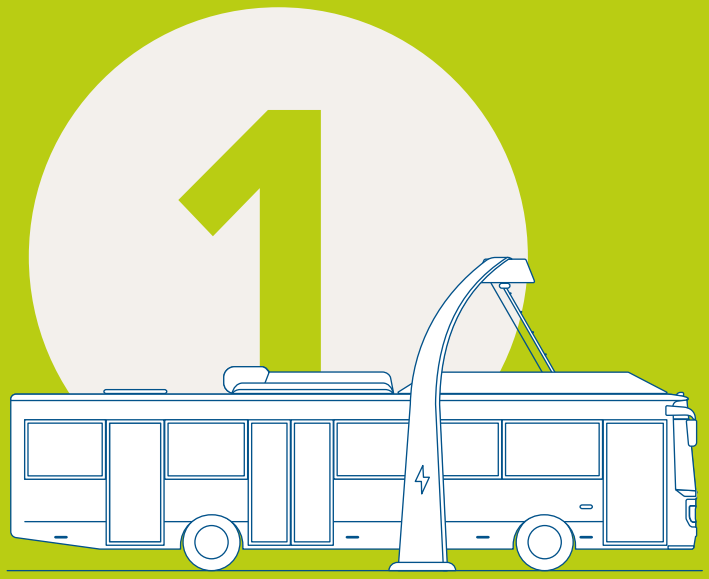
Buses » Mini buses » Standard

Baseline year

» Actual numbers/estimated numbers

Data sources

» RTO, fleet operators, fleet operator unions



Number of electric fleet operators:

Parameters

Intermediate public transport

» E-auto-rickshaws » E-rickshaws

» E-taxis » Any other

Baseline year

» Actual numbers/estimated numbers

Data sources

» RTO, fleet operators, fleet operator unions

Number of electric fleet operators:

Parameters

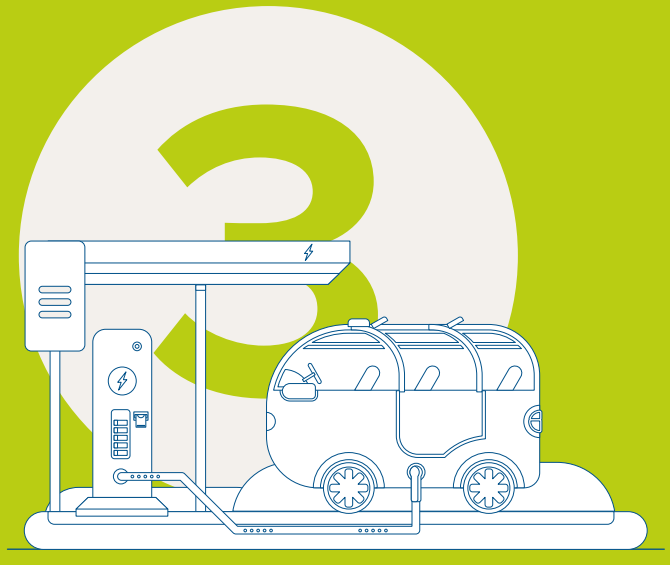
Commercial vehicles » LCVs » HCVs

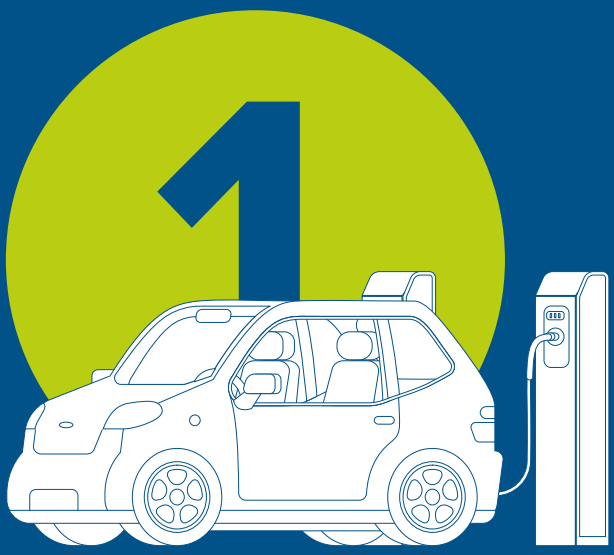
Baseline year

» Actual numbers/estimated numbers

Data sources

» RTO, public transport companies, fleet operators, fleet operator unions, OEMs





Number of public EV charging points in the city:

Parameters

» Level 1

Baseline year

» Number and location

Data sources

» DISCOM, municipality, fleet operators

Number of public EV charging points in the city:

Parameters

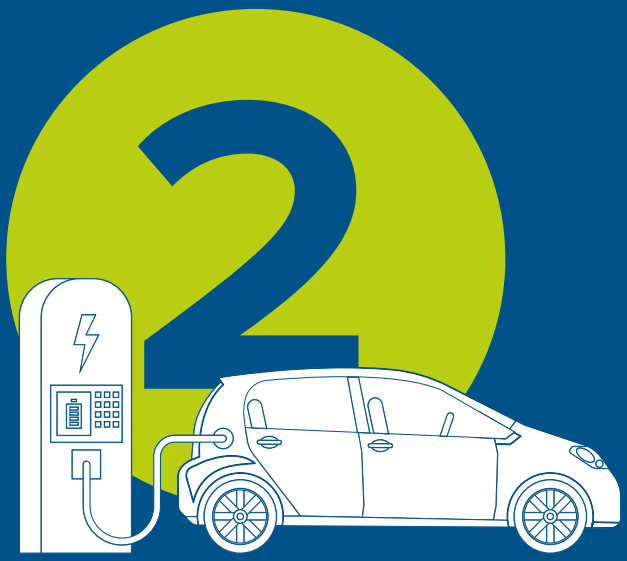
» Level 2

Baseline year

» Number and location

Data sources

» DISCOM, municipality, fleet operators



Number of public EV charging points in the city:

Parameters

» Level 3

Baseline year

» Number and location

Data sources

» DISCOM, municipality, fleet operators

Current policies, regulations, incentives for EVs:

Parameters

» Fiscal—like subsidy, rebates etc. on EVs

Baseline year

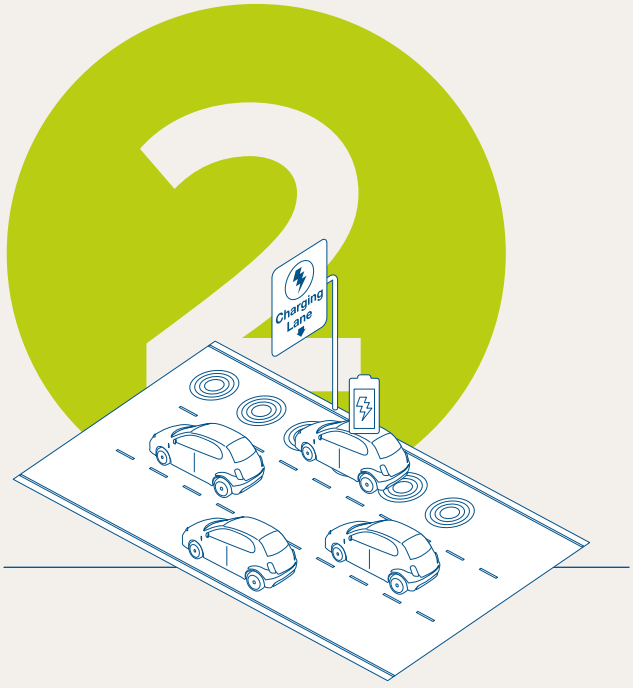
» Central and state incentives available for different categories of EVs

» Any city-level incentive for supporting EVs —provide details of the city—incentive scheme

» Investment made by the city in the scheme since the implementation of it

Data sources

» Department of Transport, Department of Finance, Department of Environment, Public Works Department, Department of Housing, State Nodal Department/Committee, State Electricity Board, City level Electricity Utility Board, Traffic Police Department, municipality, Urban Development Authority, public transport operators, fleet operators, OEMs



Current policies, regulations, incentives for EVs:

Parameters

» Non-fiscal: like low-emission zones, lane priority, parking reservation for EVs etc.

Baseline year

» Details of the schemes

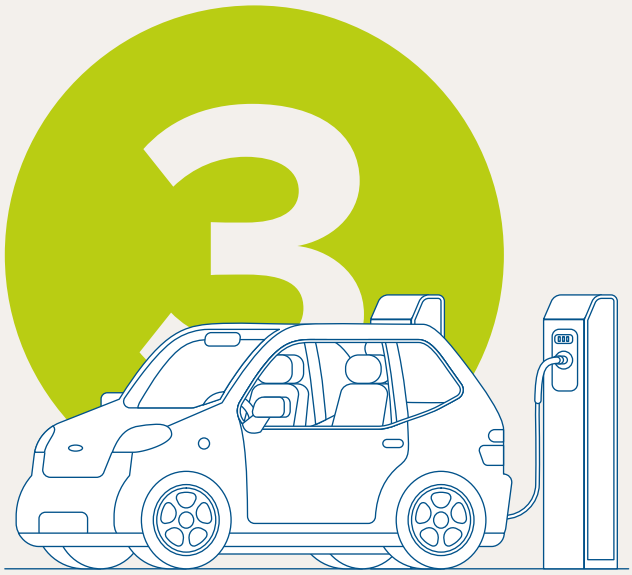
» Location and impact

» Investment made by the city in these schemes

Data sources

» Department of Transport, Department of Finance, Department of Environment, Public Works Department, Department of Housing, State Nodal Department/Committee, State Electricity Board, City level Electricity Utility Board, Traffic Police Department, municipality, Urban Development Authority, public transport operator, fleet operators, OEMs

Current policies, regulations, incentives for EVs:



Parameters

» Charging infrastructure

Baseline year

» Details of the schemes

» Location and impact

» Investment made by the city in these schemes

Data sources

» Department of Transport, Department of Finance, Department of Environment, Public Works Department, Department of Housing, State Nodal Department/Committee, State Electricity Board, City level Electricity Utility Board, Traffic Police Department, municipality, Urban Development Authority, public transport operator, fleet operators, OEMs

Public awareness campaign (PAC):

Parameters

Are there any PACs running in the city to promote EVs?

» Government/private-sector led initiatives

» Other city-led initiatives to promote EVs

Baseline year

» Details of the campaign

» Impact

» Investment made by the government/ private entity

Data sources

» Department of Transport, Department of Finance, Department of Environment, Public Works Department, Department of Housing, State Nodal Department/Committee, State Electricity Board, City level Electricity Utility Board, Traffic Police Department, municipality, Urban Development Authority, public transport operator, fleet operators, OEMs

2.0 Institutional frameworks for planning & implementing e-mobility

If a nodal body for the purpose of planning, designing and implementing electric mobility has been identified in the city, this body should be the executive and lead body for all functions, roles and initiatives in respect of coordinating the efforts for implementing electric mobility in the city. In case the city does not have an institutional set-up for planning and coordinating the efforts for implementation of e-mobility, it is highly recommended that the city constitutes a body/committee of relevant departments and experts for coordinating city-level efforts for planning, designing and implementing electric mobility.

The government representatives of this body/committee could include officials from the city's municipal agency, Smart City SPV, traffic police, urban development authority, electricity department/DISCOM, public transport corporation, etc. It is suggested that in addition to government officials, the nodal body should also find a mechanism to work with non-government actors in the e-mobility space.

What should be the key roles and functions of the city-level nodal agency?

The city-level nodal agency must work towards implementing and achieving the centre and state-level initiatives and targets for electric mobility, considering the city-level opportunities and barriers. It should accordingly formulate city-level e-mobility strategy and identify projects that the city should be implementing. The agency should also take the responsibility of coordinating project implementation, monitoring and evaluation and review/revision of the e-mobility strategy periodically.

Government representatives

1. Smart City SPV
2. traffic police
3. municipal agency
4. urban development authority
5. electricity department/ DISCOM
6. public transport operators

Non-government representatives

1. EV, automative, power, urban transport experts
2. members of transport unions
3. members of RWAs
4. members of academic/research institutes

Centre

» Providing funds
» Providing technical assistance and capacity building
» Setting national-level targets/norms
» National-level monitoring
» Coordination of state-level efforts

State

» Providing funds
» Providing technical assistance and capacity building
» Setting state-level targets/norms
» State-level monitoring
» Coordination of city-level efforts

City

» Set EV targets for the city
» Formulate projects/strategies/ recommendations
» Project implementation
» Project monitoring and evaluation
» Review/revision of the e-mobility strategy periodically

3.0 Planning for electric mobility in the city

As suggested, the nodal agency should focus on drawing a strategic plan for adopting electric mobility in the city. This plan should focus on medium to long-term strategy to allow the city to undertake a sustained and concerted effort towards promoting e-mobility. In addition, the city would also need to invest in short-term or pilot projects to test and verify the feasibility of different solutions.

This section will help the city identify medium- to long-term objectives and targets for electric mobility; help build medium or long-term growth scenarios for penetration of e-mobility; and also help them identify medium- to long-terms projects.

Step-wise guide to drawing a medium to long-term e-mobility plan/strategy

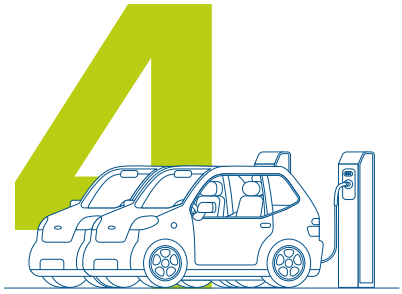
Step 1: Set long-term objectives

It is suggested that the city manager identifies specific objective/s for the city. These objectives should address the ongoing or likely issues that the city might face in the near future. These objectives may be:

Air quality improvement

Least cost intervention

Revenue improvement

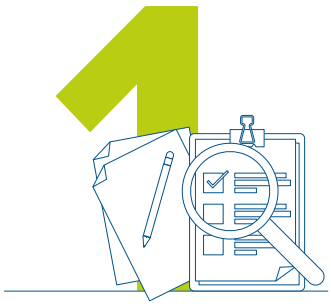


Boost e-mobility industry in the city

Improve mobility choices

Increase ZEV transit use

Step 2: Medium- to long-term strategic objectives



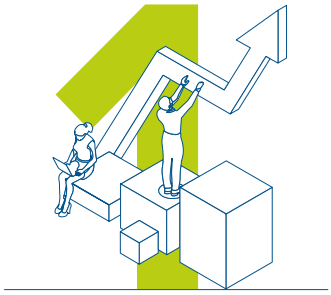
Identify long-term objectives for the city

Set targets and build medium- to long-term growth scenario

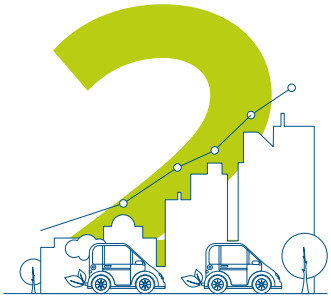
Identify pilot/medium- to long-term projects/ strategies

Step 3: Identify scenarios and set targets for penetration of EVs

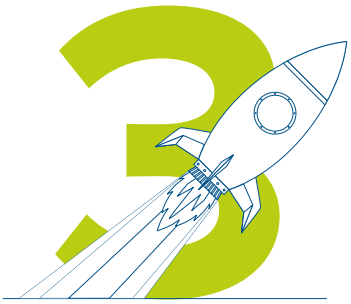
It is suggested that the objective/s be converted to likely scenarios that the city would like to follow to approach electric mobility in the city. These scenarios should be developed considering the objectives, capacity and resources available in the city. These scenarios could be one of the following:



BAU



Optimistic scenario



Aggressive scenario

» **BAU:** In this scenario, the city may decide to follow a growth path for EV uptake on a par with their current growth or aiming at minimal penetration of EVs in the city.

» **Optimistic scenario:** In this scenario, the city may decide to follow a growth path for the uptake of EV on a par with their current growth or aiming at minimal penetration of EVs in the city.

» **Aggressive scenario:** The city may decide to follow an aggressive path for adopting electric mobility and aim at a high penetration of EVs in the city.

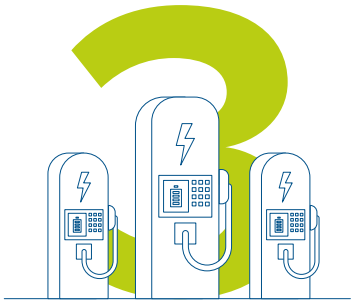
For the above scenarios, it is suggested that the city also identifies targets for EV uptake. It is recommended that the city sets up annual targets for different vehicle segments.

Step 4: Identify strategies and projects

Once the city determines the targets and EV uptake growth scenario, the city manager should identify policies/strategies/instruments to achieve the targeted level of electrification. Electrification in the city could be encouraged using various instruments. These could be:

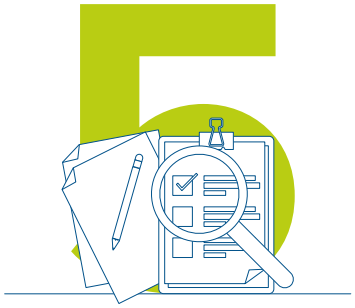
Bringing down the upfront cost of EVs

Bringing down the operating cost of EVs



Incenticizing deployment of charging infrastructure

Incentivizing OEMs to sell EVs and non-fiscal measures



Non-fiscal/regulatory measures

Examples of measure/s that the city manager could deploy have been provided in the following sections.

1

Bringing down the upfront cost of EVs: vehicle purchase incentives, insurance discounts

Stakeholders

» Center, state, municipality and other ULBs

Likely benefits

» Encourage EV adoption

Likely barriers

» Center, state, municipality and other ULBs

Actions for stakeholders

» Design incentive scheme

» Notify relevant authorities such as the department of transport, municipal body, etc. to implement the new policy

» Inform the likely beneficiaries such as the fleet operators, public transport corporation and vehicle owners

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Measures

» Tax based on vehicle perfomance such as fuel efficiency

Stakeholders

» Center, state, municipality and other ULBs

Likely benefits

» Encourage EV adoption

Likely barriers

» Tax foregone/loss of likely revenue

Actions for stakeholders

— DO —

2

Bringing down the upfront cost of EVs: differentiated tax

3

Bringing down the upfront cost of EVs: feebate

Measures:

» Imposing fees and rebates based on performance of vehicles

Likely benefits

» Revenue neutral

» Encourage EV adoption and discourage ICEVs adoption

Likely barriers

» Acceptability to OEMs

Actions for stakeholders

— DO —

Stakeholders

» Municipal body and other bodies responsible for parking management in the city

Likely benefits

» Encourage use of EV

Likely barriers

» Revenue foregone

Actions for stakeholders

» Draw/amend existing parking policy with a provision of free/discounted parking for EVs

» Notify relevant authorities such as the Department of Transport, traffic police, municipal body, etc., to implement the new policy

» Inform the public

1

Bringing down the operational cost of EVs: dedicated parking for EVs

Bringing down the upfront cost of EVs: discounted parking for EVs

Stakeholders

» Municipal body

Likely benefits

» Encourage use of EVs

Likely barriers

» Revenue foregone

Actions for stakeholders

» Draw/amend existing parking policy with a provision of free/discounted parking for EVs

» Notify relevant authorities such as the Department of Transport, traffic police, municipal body, etc., to implement the new policy

» Inform the public

Measures

» Tax based on vehicle perfomance like fuel efficiency

Stakeholders

» Centre, state, municipality and other ULBs

Likely benefits

» Encourage EV adoption

Likely barriers

» Public acceptability

» Difficult to enforce

Bringing down the upfront cost of EVs: dedicated parking for EVs

Actions for stakeholders

» Draw/amend existing parking policy with a provision of free/discounted parking for EVs

» Notify relevant authorities such as the Department of Transport, traffic police, municipal body, etc., to implement the new policy

» Inform the public

4

Bringing down the upfront cost of EVs: free charging for EVs

Stakeholders

» Municipal body, DISCOMs, private entities

Likely benefits

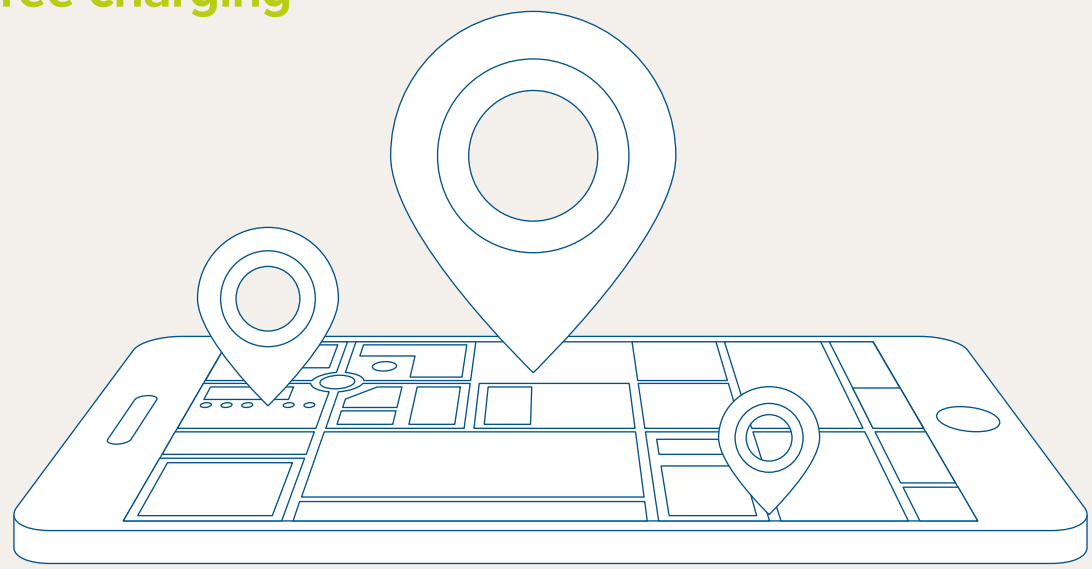
» Encourage use of EVs

Likely barriers

» Revenue foregone

Actions for stakeholders

» Develop a mechanism to implement the scheme with DISCOMs



Stakeholders

» Municipal body, DISCOMs, private actors providing charging solutions

Likely benefits

» Encourage EV adoption

Likely barriers

» Develop a mechanism to implement the scheme with DISCOMs

Bringing down the upfront cost of EVs: discounted charging rates for EVs

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Bringing down the upfront cost of EVs: priority lanes for EVs

Stakeholders

» Traffic police, municipal body, PWD

Likely benefits

» Encourage use of EVs

Likely barriers

» Public acceptability

» Difficult to enforce

Actions for stakeholders

» Identify lanes where this scheme could be implemented

» Draw detailed design for implementation of the scheme

» Relevant authorities such as the Department of Transport, traffic police, municipal body, etc., to implement the new policy

» Inform the public

Measures

» Exemption/discount from toll charges

» Exemption/discount from congestion charges

Stakeholders

» Traffic police, municipal body, PWD, toll operator/s

Likely benefits

» Encourage use of EVs

Likely barriers

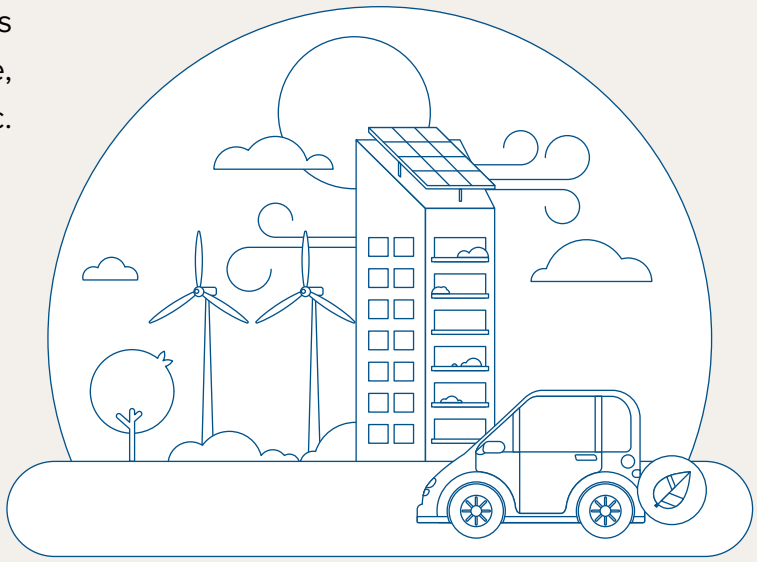
» Revenue foregone

Actions for stakeholders

» Develop a mechanism to implement the scheme with relevant stakeholders such as the Department of Transport, traffic police, toll operator/s, municipal body, etc.

7

Bringing down the upfront cost of EVs: reduced charges on use of infrastructure by EVs



Bringing down the upfront cost of EVs: Electric Vehicle Supply Equipment (EVSE) financing

Stakeholders

» OEMs, EVSE manufacturers, private entities

Likely benefits

» Encourage deployment of EV charging infrastructure and hence promote use of EVs

Likely barriers

» Revenue foregone

Actions for stakeholders

» Develop and implement the scheme with the support of OEMs/EVSE manufacturers

Measures

» Adopting open standards for vehicle charge points and payment to allow interoperability between charging networks

Stakeholders

» OEMs, EVSE manufacturers, Bureau of Energy Efficiency (BEE), municipal body

Likely benefits

» Encourage deployment of EV charging infrastructure and hence promote the use of EVs

» Encourage private sector participation in deployment of EV charging

Likely barriers

» May be a challenge for OEMs due to

Incentivizing deployment of charging infrastructure

factors such as high cost of shifting to a new technology

Actions for stakeholders

» Adopt standards in consultation with technology experts/OEMs/EVSE manufacturers

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2

Incentivizing deployment of charging infrastructure

Measures

» Mandating provision of EV charging through building bylaws

Stakeholders

» Municipal body, Urban Development Authority, OEMs, EVSE manufacturers

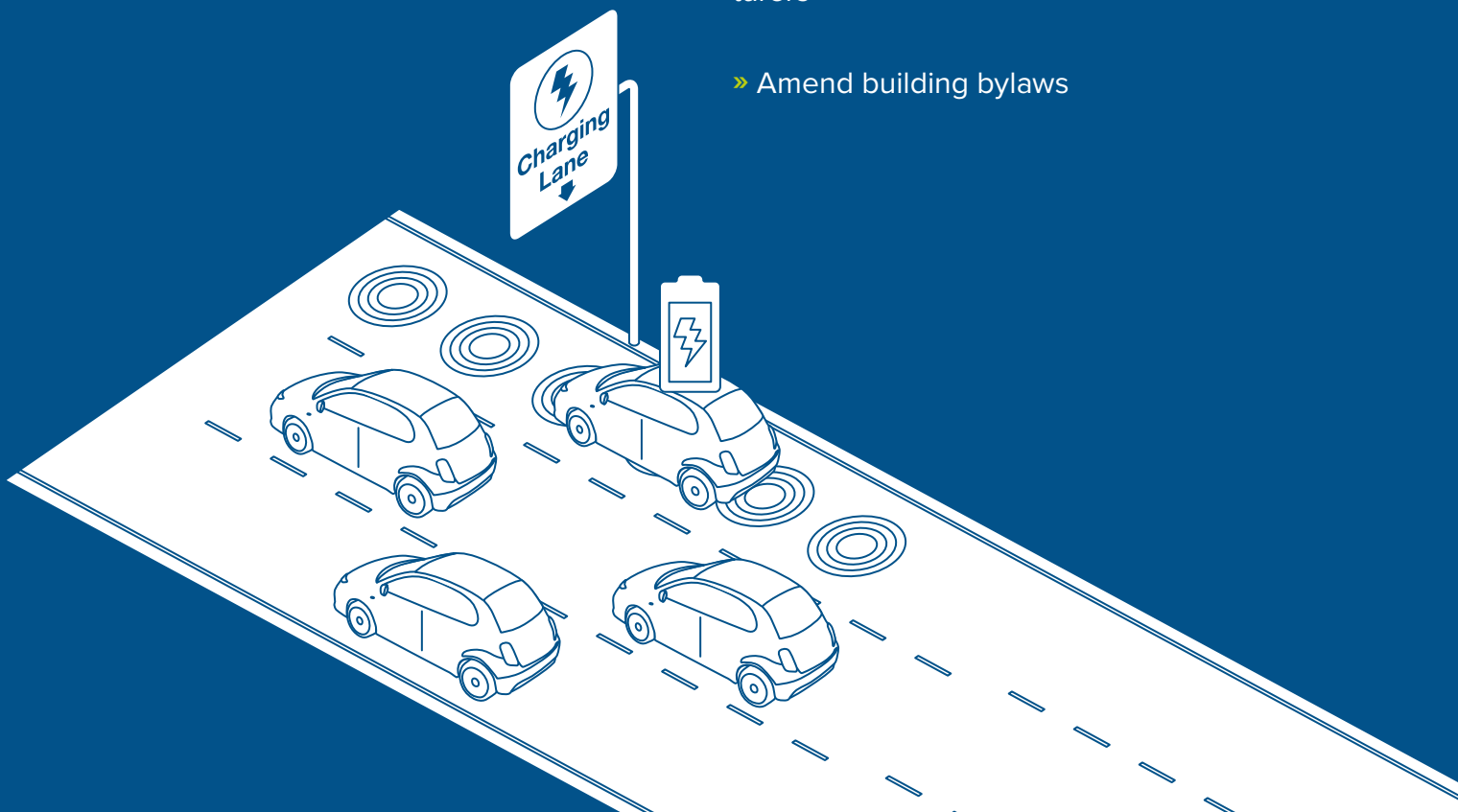
Likely benefits

» Help make buildings become EV-ready and thereby promote use of EVs

Action for stakeholders

» Adopt new standards in consultation with technology experts/OEMs/ EVSE manufacturers

» Amend building bylaws



Measures

» Relax regulations to set up EV charging station/s

Stakeholders

» Municipal body, Urban Development Authority, DISCOM

Likely benefits

» Encourage deployment of EV charging infrastructure and hence promote the use of EVs

» Encourage private sector participation in deployment of EV charging infrastructure

Action for stakeholders

» Draw scheme/amend regulations to facilitate easy setting up of EV charging stations

Incentivizing deployment of charging infrastructure

Incentivizing deployment of charging infrastructure

Measures

» Mandating investment in charging infrastructure through government/private/PPP mechanism

Stakeholders

» Municipal body, Urban Development Authority, DISCOM

Likely benefits

» Result in better EV charging infrastructure in the city and hence promote use of EVs

Action for stakeholders

» Draw scheme in consultation with the Department of Finance at state and city levels

Measures

» Providing financial support for setting up of EV charging stations: low interest rate loans and loan guarantees

Stakeholders

» Municipal body, Urban Development Authority, DISCOM

Likely benefits

» Encourage deployment of EV charging infrastructure and hence promote the use of EVs

» Encourage private sector participation in deployment of EV charging infrastructure

Action for stakeholders

» Draw scheme/amend regulations to facilitate easy setting up of EV charging stations

Incentivizing deployment of charging infrastructure

Incentivizing deployment of charging infrastructure

Measures

» Implement smart charging system

Stakeholders

» DISCOM, municipal body, private entities

Likely benefits

» Encourage use of EVs

Likely barriers

» Technical challenges

Action for stakeholders

» Engage with DISCOMs to undertake shift to smart charging system

1

Incentivizing OEMs to sell EV and non-fiscal measures: ZEV credits explanation

Measures

» OEMs earn credit on sale of EVs; ZEV credits are bankable and saleable

Stakeholders

» State and center: not directly under the city's purview

Likely benefits

» Encourage OEMs to invest in EVs

Likely barriers

» May be expensive

» Need for institutional se-tup to implement it

Actions for stakeholders

» No action for the city

Measures

» Mandatory EV sales targets for OEMs

Stakeholders

» State and Centre: not directly under the city's purview

Likely benefits

» Encourage OEMs to invest in EVs

Likely barriers

» Strong commitment from government

Actions for stakeholders

No action for the city

2

Incentivizing OEMs to sell EV and non-fiscal measures: ZEV mandate

3

Incentivizing OEMs to sell EV and non-fiscal measures: compulsory purchase order

Measures

» Government fleet, fleet operators (mobility as a service)

Stakeholders

» City government departments

Likely benefits

» Encourage OEMs to invest in EVs

Likely barriers

» Financing

Actions for stakeholders

» Identify government departments with fleet requirement

» Plan EV fleet uptake with the identified departments

Measures

» Compulsory electric vehicle fleet for public transport (public and private operators)

Stakeholders

» Public and private fleet operators

Likely benefits

» Encourage OEMs to invest in EVs

Likely barriers

» Opposition from fleet operators

Actions for stakeholders

» Identify fleet operators in the city

» Draw an EV uptake plan and a phase-out plan in consultation with the fleet operators

» Implement plan

4

Incentivizing OEMs to sell EV and non-fiscal measures

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Incentivizing OEMs to sell EVs and non-fiscal measures: zero emission/low-emission zones

Stakeholders

» Traffic police, Urban Development Authority, municipal authority, public transport operators, technology providers, etc.

Likely benefits

» Significant air quality improvement in the ZE/LE zone

» Congestion reduction

» Revenue generation if fees imposed on entry of ICEVs

» Revived local economy

Likely barriers

» Political and public acceptability

» Difficult to plan and implement

» Requires high investment, especially if the city relies on electronic measures to ensure enforcement

Actions for stakeholders

» Plan and implement the scheme in collaboration with relevant stakeholders such as traffic police, Urban Development Authority, municipal authority, public transport operators, technology providers, etc.

Stakeholders

» Transport department

Likely benefits

» Higher preference for EVs than ICEVs among consumers

» Increased penetration of EV fleet

Likely barriers

» Public acceptability

Actions for stakeholders

» Plan and implement the scheme in consultation with the Department of Transport

Incentivizing OEMs to sell EVs and non-fiscal measures: preferential registration for EVs

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Bringing down the upfront cost of EVs: limiting registration of ICE vehicles

Stakeholders

» Transport department

Likely benefits

» Discourage use of EVs

» Improve user preference for EVs

Likely barriers

» Public acceptability

Actions for stakeholders

» Plan and implement the scheme in consultation with the Department of Transport

Incentivizing OEMs to sell EVs and non-fiscal measures: ban on sale of certain categories of ICE vehicles

Stakeholders

» Transport department, municipal body, Urban Development Authority, traffic police

Likely benefits

» Discourage use of ICEs

» Improve user preference for EVs

Likely barriers

» Opposition from public, OEMs

Actions for stakeholders

» Plan and implement the scheme in consultation with the Department of Transport

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Stakeholders

» Municipal body, Urban Development Authority, traffic police

Likely benefits

» Discourage use of EVs

» Improve user preference for EVs

Likely barriers

» Public acceptability

Actions for stakeholders

» Plan and implement the scheme in consultation with the traffic police

Incentivizing OEMs to sell EVs and non-fiscal measures: ban/access restrictions on movement of ICEVs within certain areas/regions

Short-term/pilot projects

Actions for stakeholders:

- Plan the scheme
- Assess technology options available in the market
- Get in touch with successful technology providers
- Identify financing options
- Plan for the pilot test, train staff
- Procure e-buses/e-vehicles
- Operation of the e-bus/e-vehicles
- Monitor the performance
- Evaluate the performance
- Based on the evaluation, determine the future plan as to whether to scale up the same technology or test a new one

E-bus operation

Stakeholders:

- Air quality benefit
- Savings for fleet operators

Likely benefits:

- High upfront cost for vehicle purchase
- Lack of technical capability for upkeep and maintenance of e-buses

Likely barriers:

- High upfront cost for vehicle purchase
- Lack of technical capability for upkeep and maintenance of e-buses

EV fleet deployment as first- last-mile solution

Measures:

- e-autorickshaw
- e-rickshaw
- e-taxi
- e-buses (mini buses)

Stakeholders:

- OEMs, public transport, agencies and fleet operator/drivers

Likely benefits:

- Air quality benefit
- Savings for fleet operator

Likely barriers:

- High upfront cost for vehicle purchase
- Lack of technical capability for upkeep and maintenance of e-buses

Actions for stakeholders:

- Plan the scheme
- Assess the technology options available in the market provided by successful technology operators
- Identify financing options
- Plan for the pilot test, train staff
- Procure e-buses/e-vehicles
- Operation of the e-bus/e-vehicles
- Monitor the performance
- Evaluate the performance
- Based on the evaluation, determine the future plan as to whether to scale up the same technology or test a new one

EV sharing schemes

Measures:

» e-cars
» e-scooters
» e-bike

Stakeholders:

» OEMs/EV sharing company

Likely benefits:

» Air quality benefit
» Savings for fleet operators

Likely barriers:

» Air quality benefits
» Congestion reduction
» Improved mobility

Actions for stakeholders:

» Plan the scheme
» Assess the technology options available in the market
» Get in touch with successful technology providers
» Identify financing options
» Plan for the pilot test, train staff
» Procure e-buses/e-vehicles
» Operation of the e-bus/e-vehicles
» Monitor the performance
» Evaluate the performance
» Based on the evaluation, determine the future plan as to whether to scale up the same technology or test a new one

Deployment of public chargers

Stakeholders:

» DISCOMs

Likely benefits:

» Encourage use of EVs

Likely barriers:

» Land availability

Zero/low emission zone

Stakeholders:

» Municipal body, traffic police

Likely benefits:

» Significant air quality improvement in the ZE/LE zone
» Congestion reduction
» Revenue generation if fees imposed on entry of ICEVs
» Revived local economy

Likely barriers:

» Political and public acceptability
» Difficult to plan and implement
» Investment intensive proposition, especially if the city relies on electronic measures to ensure enforcement

Actions for stakeholders:

» Plan and implement the scheme in collaboration with relevant stakeholders such as traffic police, Urban Development Authority, municipal authority, public transport operators, technology providers, etc.

Free EV charging facilities in the city

Stakeholders:

» Municipal body, DISCOMs, private entities

Likely benefits:

» Encourage use of EVs

Likely barriers:

» Revenue foregone

Actions for stakeholders:

» Develop a mechanism to implement the scheme with DISCOMs

Priority lanes for EVs

Stakeholders:

» Traffic police, municipal body, PWD

Likely benefits:

» Encourage use of EVs

Likely barriers:

» Public acceptability
» Difficult to enforce

Actions for stakeholders:

» Develop a mechanism to implement the scheme with relevant stakeholders such as the Department of Transport, traffic police, municipal body, etc.

Exemption from toll charges

Stakeholders:

» Toll operator/s

Likely benefits:

» Encourage use of EVs

Actions for stakeholders:

» Develop a mechanism to implement the scheme with relevant stakeholders such as the Department of Transport, traffic police, municipal body, etc.

Exemption from parking charges

Stakeholders:

» Municipal body

Likely benefits:

» Encourage use of EVs

Actions for stakeholders:

» Draw/amend existing parking policy with a provision of free/discounted parking of EVs

» Notify relevant authorities such as the Department of Transport, traffic police to implement the new policy

» Inform the public

Reserved parking for EVs

Stakeholders:

» Municipal body

Likely benefits:

» Encourage use of EVs

Likely barriers:

» Difficult to enforce

Actions for stakeholders:

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Public awareness campaign

Measures:

» Website

» Demonstration zones

Stakeholders:

» Municipal body, OEMs

Likely benefits:

» Encourage use of EVs

Actions for stakeholders:

» Plan the awareness campaign and engage with relevant stakeholders such as schools, colleges, etc.

4.0 Project implementation

As India continues to experience rapid urbanization, managing urban environmental quality will be critical to ensure well-being. Considering severe air quality concerns and rising GHG emissions, clean mobility solutions like electric mobility are gaining traction in urban centers around the world. Indian cities have been no different. As has been discussed in the framework document, many Indian cities are piloting electric mobility technologies with the aim at further scaling the uptake of this technology.

This document is second in line among the series of documents under the electric mobility component. The previous framework document presents a knowledge base on India. The current workbook document is designed to support cities in implementing electric mobility solutions. The workbook will introduce various steps required for identifying strategies and implementing plans for promoting electric mobility in respective cities. This document will specifically help the city managers in:

- Assessing the current status of their cities in terms of EV uptake
- Drawing institutional framework for planning and implementing e-mobility in their city
- Identifying measures and strategies through

which the city will be able to approach/ promote electrification in transportation sector

» Suggesting how cities can implement the identified measures and strategies

To help assess the aforementioned, the document is structured in the following parts:

Constituents of the TOR

01 Background and objective

» Provide study context, need and specific objectives

02 Scope

» Conduct baseline study and collect baseline data for the proposed area/corridor

» Prepare Detailed Project Report (DPR) for implementation of the selected strategies, including detailed design plans, infrastructure requirements, pricing schemes, etc.

» Identify institutional barriers and propose an institutional framework for implementation and management of scheme/s

» Ensure coordination between the various government departments and private stakeholders such as the fleet operators

» Review zoning laws and building bylaws to ensure that they support the schemes

» Identify potential issues regarding policy changes and propose possible solutions

» Identify financial requirements for project implementation and suggest funding sources

» Propose a plan for creating public awareness and holding public consultations

» Monitor and evaluate the implementation of schemes and propose periodic revisions

» Obtain public feedback regarding the strategies being implemented

03 Technical qualification

» Consultants/firms having relevant and similar experience or expertise in planning, designing and monitoring e-mobility projects should be invited

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