CSTEP
CENTER FOR STUDY OF SCIENCE, TECHNOLOGY & POLICY

# Assessment Framework to Identify Location for Public Charging Stations

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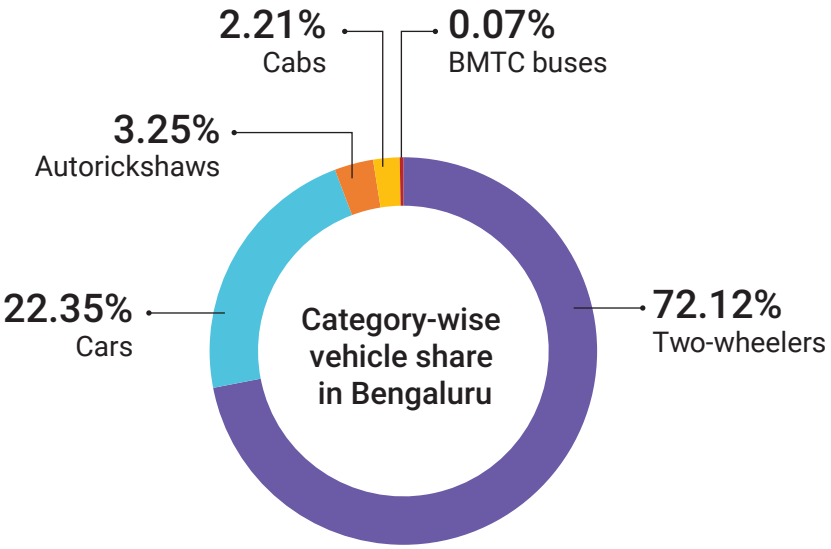
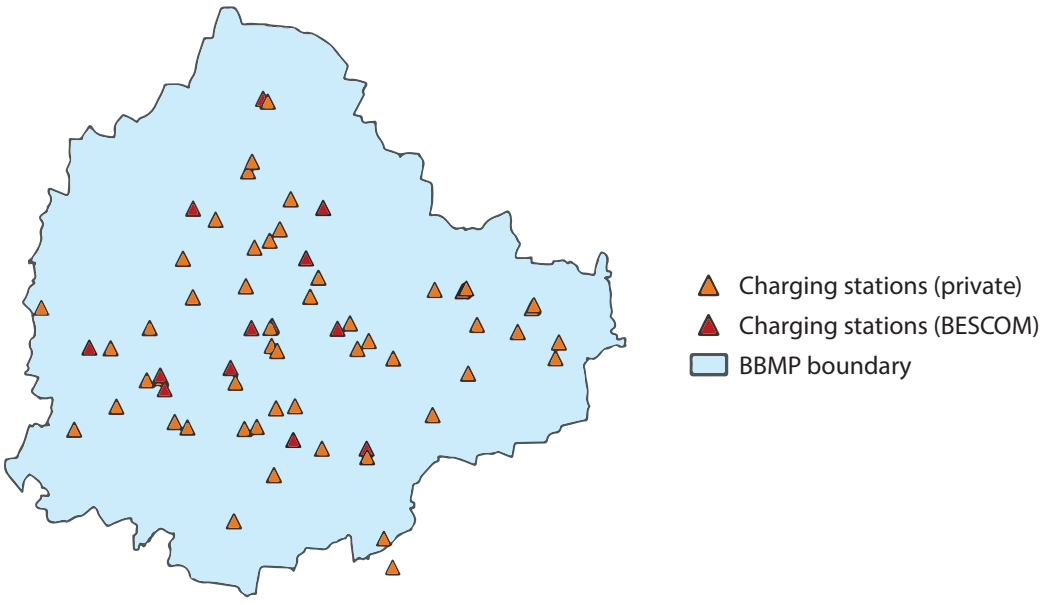
# Introduction

Karnataka is at the forefront of the EV revolution in India, with the state government's Karnataka Electric Vehicle and Energy Storage Policy, 2017, targeting 100% EV penetration in the IPT segment in Bengaluru by 2030. Though the current share of passenger transport vehicles (three-wheelers, cabs, and public buses) of the total registered vehicles in Bengaluru is ~10%, the daily distance travelled by these vehicles is significantly high (private cars and two-wheelers run ~10 km and autorickshaws/cabs run ~150–300 km per day). This makes them the ideal segment to be considered for public fleet charging stations.




Bangalore Electricity Supply Company Limited (BESCOM), the city electricity distribution company, has already installed 136 public charging stations at 70 locations across Bengaluru in 2020 and plans to install 140 more in the near future. Land availability is a significant factor when it comes to setting up the EV charging infrastructure. The Center for Study of Science, Technology and Policy (CSTEP) undertook a study to derive a framework that enables decision-makers to identify potential areas for setting up public charging stations.



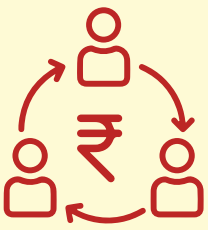

Existing private and BESCOM public charging stations in Bengaluru

# Key insights

Land use, traffic, transport, vehicle characteristics, and grid infrastructure are deciding factors in identifying charging locations.

Wards with high-density corridors, BESCOM substations, and public parking lots are ideal for public charging stations.

Government land, government parking lots, and cab or auto aggregators' parking lots should be targeted to reduce the real-estate cost and capture demand.



Different financial models such as collaborations between stakeholders (electricity utilities and cab aggregators, public transport providers, commercial establishments, etc.) should be explored to help reduce the burden on public utilities and increase revenue generation.

# How it works

## Public Electric Vehicle Fleet Charging Stations Assessment Framework

### Focus Area

Demographics
Socio-economic data
Spatial data
Growth rates

### Vehicle

Battery range
Charger type and charging time
Fleet-wise number of EV sales
Policy targets for EV penetration
ICE vehicle characteristics


### Land use & Transport

Land use & O-D data
Traffic & travel characteristics
Major traffic transit nodes
Parking lots, taxi, auto stands, and fuel stations
Existing chargers: location, number, and type

### Infrastructure

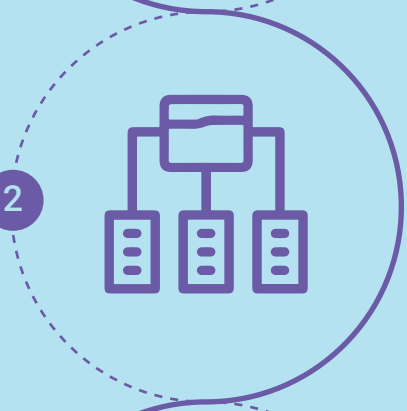
Area-wise capacity and utilisation
Under-utilised areas
Density of chargers and EV
Policy measures

**Locations, Demand, Chargers, Land Requirement, & Emission Reduction**

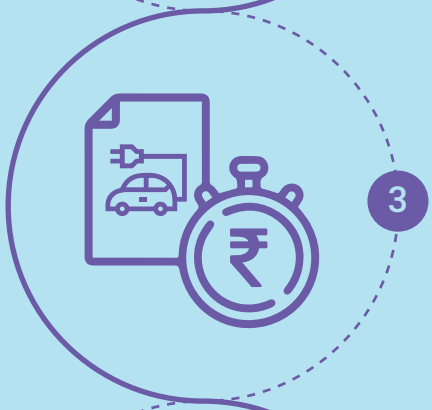
# Approach

1 **Identify wards (locations) having**

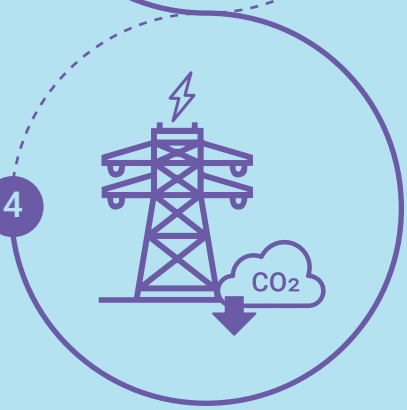
- High population density
- High-density traffic corridors
- EV charging stations
- Existing substations
- Transit nodes



2 **Develop a scalable and replicable framework based on the above parameters**



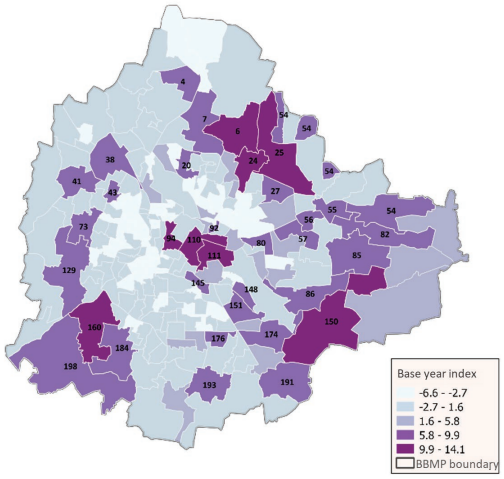
3 **Estimate EV penetration for the horizon year (2031) based on the existing policy landscape**



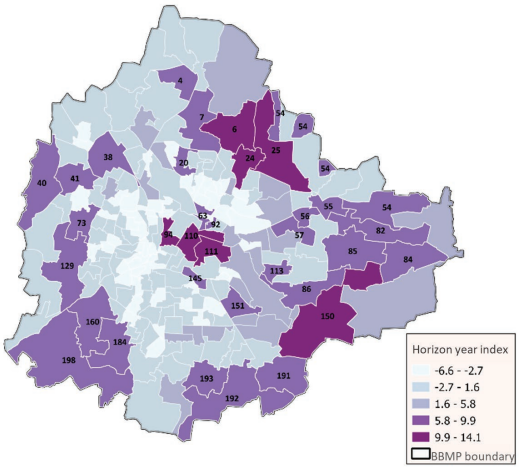

4 **Identify the potential for carbon reduction and energy requirement**

# City-level analysis

An aggregated result considering all the parameters is shown in the figures below for the base year (2021) and the horizon year (2031).




Potential wards (base year)

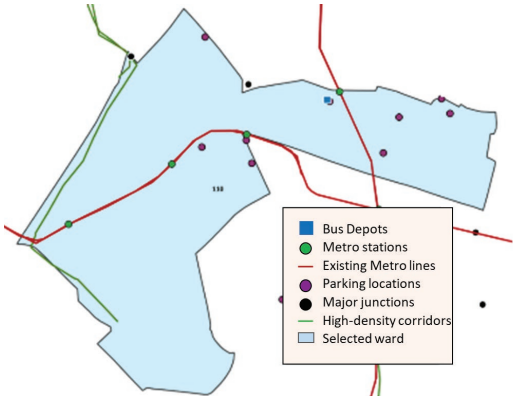



Potential wards (horizon year)

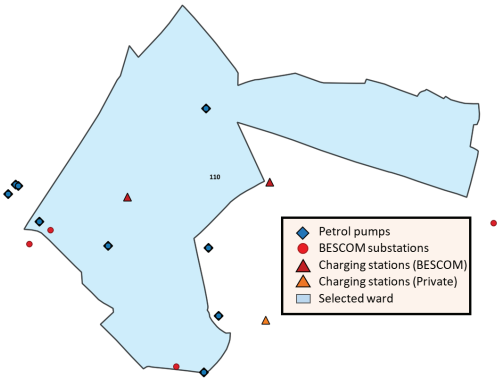
Detailed analysis sample: Ward 110, Sampangiram Nagar

- Land use: Commercial
- Population: High

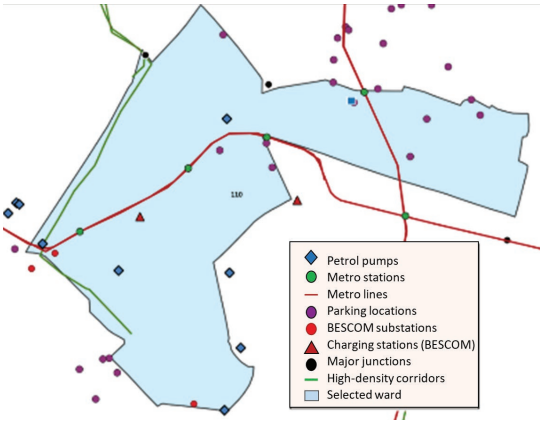
- High-density corridors, metro stations, parking lots, and junctions




- Charging stations exist
- Substations available, capacity to be studied

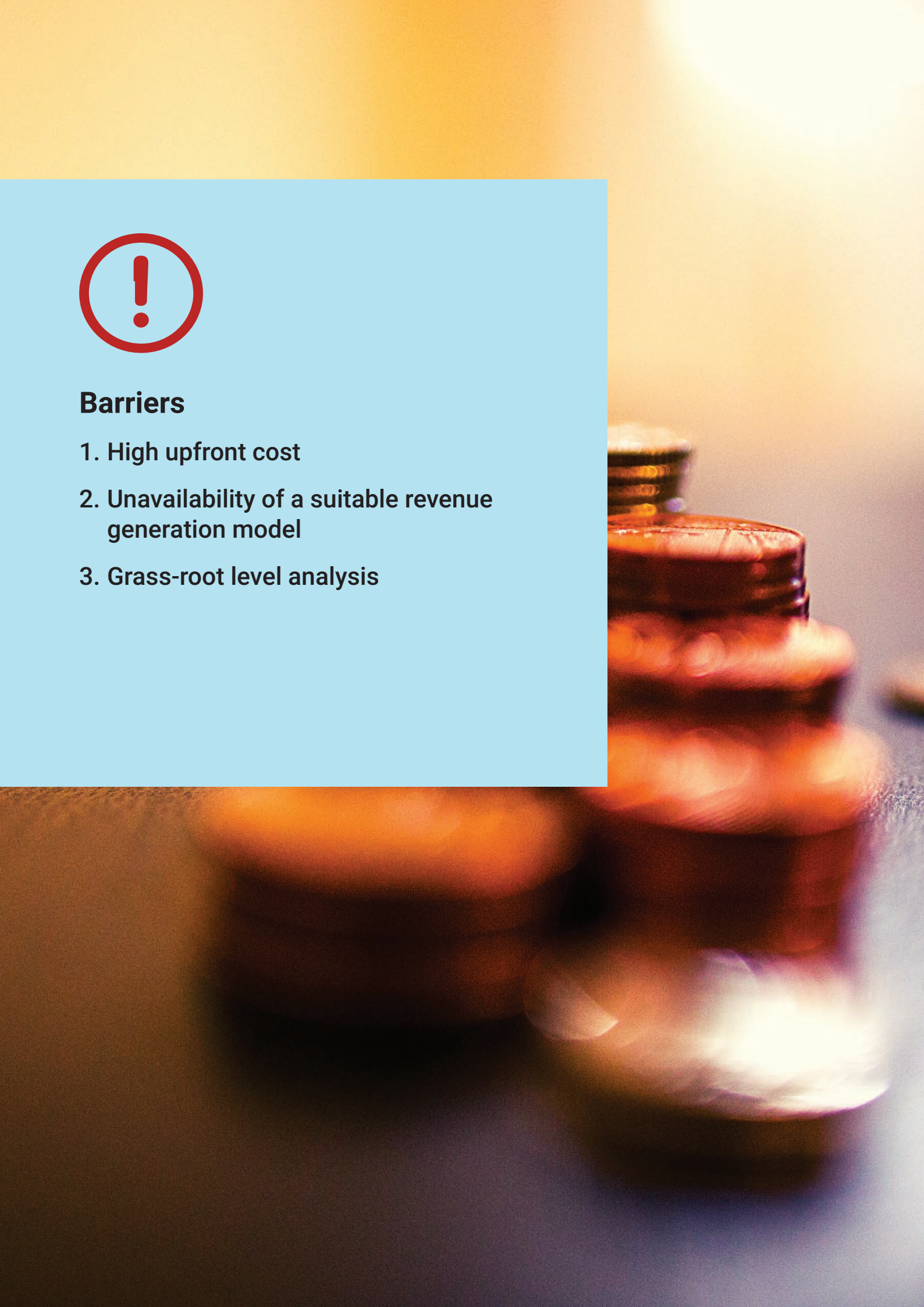



- Potential for more charging stations
- Require a mix of Level 1 and Level 2 chargers




## Benefits

1. Helps identify locations to set up public charging stations
2. Helps identify the infrastructure needed such as energy requirement and grid requirement to meet future demand



## Barriers

1. High upfront cost
2. Unavailability of a suitable revenue generation model
3. Grass-root level analysis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