SWITCH DELHI

CHARGING/SWAPPING INFRASTRUCTURE ACTION PLAN FOR DELHI 2022-25

State EV Cell,
Department of Transport,
Government of NCT of Delhi

दिल्ली सरकार
आप की सरकार

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सत्यमेव जयते

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The Government of NCT of Delhi notified the Delhi Electric Vehicles (EV) policy in August 2020 to bring about a material improvement in Delhi's environment by reducing emissions from the transport sector. Under the vision set forth by Hon'ble Chief Minister Shri Arvind Kejriwal, we are committed to decarbonise the transport sector in Delhi.

Since the launch of the Delhi EV policy, EV sales in Delhi have shown a remarkable growth with EVs averaging more than 10% of the monthly sales in 2022. In the last two years, Delhi has registered 62,000+ EV sales with 2W sales contributing 42% of the overall sales. In addition, Delhi govt is already working towards electrifying the public transportation, with Buses carrying nearly 35 lacs people everyday. 150 Electric buses are already plying on the road while the city will have 2000 E-buses by the end of 2023.

A key reason for the success of the Delhi EV policy is the steps taken by the Delhi Government in ensuring affordable access to charging and swapping stations for EVs across Delhi. In two years, Delhi has witnessed an almost 30 times growth in the deployment of public charging/swapping stations. This has been made possible by several innovative steps taken by the Delhi Government through the course of the implementation of the policy. These steps include developing a public-private partnership model for the deployment of public charging stations and setting in place a single window mechanism for setting up chargers on any premises in Delhi. We have also taken a focused approach by enabling the installation of chargers compatible with two and three-wheelers which are the priority vehicle segments for Delhi. Our policy has also provided an equal footing for battery swapping to grow in Delhi. With close to 90% of the clauses pertaining to the Delhi EV policy operationalised, it is time for Delhi to lay down the path ahead for the deployment of charging and swapping stations.

The action plan for deployment of EV charging infrastructure is a statement of intent and the approach to be followed by the Government of NCT of Delhi over the next three years to ensure that the pace of installing charging and swapping stations compliments the pace of EV adoption in the city. We are committed to ensure that every resident of Delhi is confident about affordable access to charging and swapping facilities, and no EV user in Delhi suffers from the proverbial 'range anxiety'. This is the first time such an action plan will be launched by any state in the country, and it will be instrumental in establishing Delhi as the EV capital of the world.

1. Definitions

1.1. **Public EV Charging Station'** (EVCS) refers to charging points with unrestricted and unfettered access for the public.

1.2. **'Semi-Public EV Charging Station'** refers to charging points in spaces with restricted access for the public. It includes commercial buildings like workplaces, malls and theatres, and institutional buildings like government offices and hospitals.

1.3. **'Private EV Charging Station'** refers to charging points in spaces with no access for the public and where charging is reserved for an individual or a household, E.g., single dwelling houses, parking spots in group housing societies, etc.

1.4. **'Battery Swapping Facility'** (BSF) refers to a station where a discharged or partially charged battery of an EV (primarily 2- and 3-wheelers) can be swapped for a fully charged battery.

1.5. **Charge Point Operator'** (CPO) refers to any entity engaged in the installation and operation of EV charging stations.

2. Background

2.1. The Delhi EV Policy

I. The Delhi EV policy was notified by the Government of NCT of Delhi (GNCTD) on August 7 2020. The Transport Department, GNCTD, was appointed as the nodal department for implementing the policy. Since the policy's launch, Delhi has made significant strides in adopting electric vehicles. There has since been a steady uptake in the deployment of EV charging and swapping infrastructure in the NCT of Delhi.

ii. This steady uptake has been made possible by rigorous implementation of the mandates in the Delhi EV policy. The Delhi EV policy has thirteen clauses pertaining to EV charging infrastructure, out of which ten clauses have been completely operationalised, two clauses have been partially operationalised, and one clause is yet to be operationalised.

iii. Implementing each clause has necessitated multiple institutional, design, and process-level innovations. At the institutional level, it includes setting up a 'Working Group for Accelerated Roll-out of Charging Infrastructure in Delhi,' which is the apex body responsible for developing a holistic EV charging/swapping strategy for Delhi. It also resolves any issues pertaining to the coordinated roll-out of charging and swapping stations in the city. It comprises the heads of all relevant Delhi government departments, municipal corporations, DISCOMs and external experts. It is chaired by the Vice-Chairperson of the Dialogue and Development Commission (DDC) of Delhi, the think-tank and advisory body Delhi Government.

iv. The Delhi Government launched a unique single-window process for installing and maintaining 30,000 charging points at private and semi-public sites, with the provision of availing INR 6000/charging point. Under the single-window process, chargers are available for less than INR 2500. The single-window process ensures a one-stop solution for selecting EV chargers/vendors, obtaining new electrical connections, installing charging points, and availing subsidies for chargers. The cost of the charger available under this process includes the cost of the EV charger (net of subsidy and GST), charger installation cost (including the cost of wiring up to 5 metres) and annual maintenance cost for three years. The incentives have reduced the cost of chargers by up to 70% and will potentially provide additional revenue-generating opportunities for thousands of kirana store owners.

v. Delhi Transco Limited (DTL), a state nodal agency for charging infrastructure, floated India's biggest tender for deploying public charging/swapping stations across 100 locations. The tender aggregated 100 land parcels from different land-owning agencies in Delhi. It floated a common

tender for setting up charging and battery swapping stations on these land parcels on a concessional basis. 70% of these land parcels are carved out of Delhi Metro parking stations, and service charge was kept as the bidding criteria

vi. Several regulatory changes have been enacted in Delhi to enable the accelerated deployment of charging infrastructure in Delhi. These include a special EV tariff notified the Delhi Electricity Regulatory Commission (DERC), allowing separate EV meters in buildings with an existing connection for availing EV tariff, adoption of minus metering, and allowing hardwiring of chargers with EV meters to prevent misuse.

vii. The building bye-laws have also been amended to mandate the provision of EV charging in new buildings. Another order has been issued for the mandatory installation of charging stations in existing buildings with a minimum parking space of 100 vehicles.

viii. These design and process level innovations have been instrumental in ensuring the widespread deployment of EV charging stations in public, semi-public, and private spaces. Additionally, Delhi has been at the forefront of developing a battery-swapping ecosystem in the country. It has done so by undertaking a technology agnostic approach in the disbursement of incentives. The Delhi EV policy and the DTL tender provide equitable incentives to swappable EV models and battery swapping infrastructure, respectively.

2.2. Identifying Charging Use Cases for Delhi

i. EV charging use cases in Delhi can be broadly divided into public EV charging and semi-public/private EV charging.

ii. As 2- and 3-wheelers contribute more than 40% of all vehicular pollution in Delhi, they have been identified as the priority vehicle segment. It means prioritising light EV AC/DC chargers and encouraging battery swapping.

iii. The following regulatory and market-level action points have been identified and implemented:

   a. Regulatory: In addition to the special. EV tariff, Delhi has notified laws/orders to make parking spaces in new and existing buildings EV ready. Delhi has also streamlined the installation process through a single-window process.

   b. Market-level: Delhi provides financial incentives for purchasing EV chargers and defrays significant cost components for setting up EV charging infrastructure through capital subsidy and policy level interventions. The tender for charging stations floated by the State Nodal Agency (SNA) defrays the two most significant cost components in setting up public EV charging infrastructure in Delhi, i.e. the cost of land and the cost associated with upstream electrical infrastructure.

iv. Residents in Delhi do not necessarily have private parking spaces. Hence, public charging stations must be set up to address range anxiety and provide accessible and viable charging options to EV owners.

3. Approaches to EV Charging/ Swapping Deployment in Delhi

There are broadly three approaches to the deployment of EV charging/swapping infrastructure in the NCT of Delhi.

3.1. EV Charging/Swapping Stations on Public Land

Two separate approaches have been developed for setting up EV charging and swapping infrastructure on public land in the NCT of Delhi:

i. Through an Open Tender: The Delhi EV policy mandates the setting up charging and battery swapping stations across Delhi in multiple phases by porting and providing concessional locations for charging stations at bare minimum lease rentals. The mandate was operationalised through tender floated by the SNA, designed under the aegis of the Working Group. A rigorous siting exercise was undertaken to identify 100 land parcels for deploying charging/swapping infrastructure. Further, these land parcels were clubbed into ten packages, and each package was awarded to 4 concessionaires through an open tendering mechanism.

ii. On a Nomination Basis: In this approach, the land-owning agency nominates a public sector entity and enters into a Memorandum of Understanding (MoU) to install charging stations. For instance, the Department of Transport nominated Convergence Energy Services Limited (CESL) to set up charging stations on its bus depot lands. Under the MoU, the Department of Transport will provide land, while CESL will be responsible for installing and operating the charging stations. Additionally, the MoU mandates that 20% of the area on each charging station be used to install slow chargers and service charges on all slow chargers to be less than the lowest service charge discovered through the DTL tender. The civic agencies of the NCT of Delhi have followed a similar approach for nominating public sector entity to install charging stations on their respective land parcels .

3.2. EV Charging Stations on Semi-Public/Private Land

The installation of charging stations on semi-public/private land is both government-led and private sector-led.

1. The single-window mechanism represents the former approach wherein all three DISCOMs have empanelled vendors and chargers. Any resident of Delhi can use their respective DISCOM website or make a call to place an order for the installation of charging points on their premises

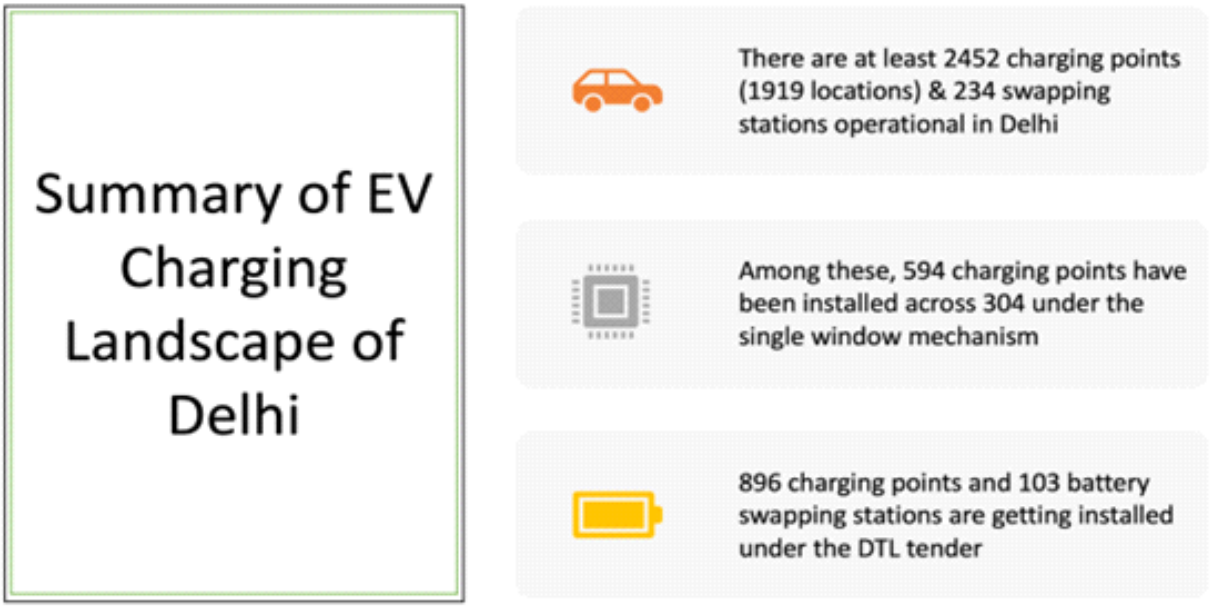
and pay the vendor net of subsidy. The vendor claims the subsidy through a digital process wherein the DISCOMs verify the vendor's claims, and the subsidy is transferred to the vendor from the State EV Fund.

2. In the private sector-led approach, charging point operators approach individuals and entities with access to parking spaces (shopping malls, group housing societies, offices etc.) for setting up charging points. The provision of special EV tariff, additional EV meters on premises with existing meters, and minus metering further facilitate the installations.

3.3. Captive Charging

This includes the electrification of public bus depots for captive charging of e-buses and the setting up of captive charging facilities by private EV fleet operators. GNCTD plans to deploy 5940 e-buses in the city, taking the e-bus contribution to 70% of the overall fleet by 2025. The government has already electrified three bus depots to cater to the charging needs of the 150 e-buses on Delhi's roads. It will also undertake the electrification of 21 bus depots by the end of 2023 to take care of the charging needs of its entire e-bus fleet.

4. Current EV Charging/ Swapping Landscape for Delhi



4.1 Delhi has at least 2452 charging points spread across 1919 locations & 234 swapping stations. These include the chargers installed under the single-window mechanism and on Delhi Transport Corporation (DTC) bus depots. Most of these charging and swapping stations are live on the Delhi EV website / One Delhi app.

4.2 594 charging points have already been installed across 304 locations under the single-window mechanism as of July 31, 2022. 98% of these chargers are the Light Electric Vehicle (LEV) AC chargers, based on the latest Power Level 1 charging standard published by the Bureau of Indian Standards, Government of India.

Type of Premises	Total Sites	Charging Points	Share (in %)
RWA	127	343	58%
Office	139	144	24%
Home	25	32	5%
Shop	2	3	1%
College	1	3	1%
Commercial	9	68	11%
Hospital	1	1	0%

DISCOM	Total Sites	Charging Points
BRPL	226	429
TATA	25	74
BYPL	53	91
Total	304	594

Charger Type	Chargers	Charging Points
LEV AC - CAPEX	579	579
AC001 - CAPEX	3	15
Total	582	594

Installation Type	Total Sites	Charging Points
Private	207	209
Semi Public	97	385
Total	304	594

4.3 896 charging points and 103 battery swapping stations are currently being installed and will be operationalised within the next two months under a tender floated by the SNA.

Charger Type (Capacity)	Parameters	Shuchi Anant Virya	Sun Mobility	Blu Smart	Jio-BP	Total
Slow Chargers	Locations	28	31	30	11	100
	Chargers	59	31	131	14	235
	Charging Points	177	93	393	42	705
Moderate/Fast Chargers (15–22 kW)	Locations	10	31	15	5	61
	Chargers	19	62	15	5	101
Non-Mandated Chargers (>22 kW)	Locations	23	15	0	8	46
	Chargers	59	15	0	16	90
Battery Swapping Stations	Locations	0	31	30	11	72
	Chargers	0	62	30	11	103

Charging and Swapping Stations Under the DTL Tender

4.4 45 charging points have been installed on seven depots under the MoU with CESL. Under a similar model, charging stations will be installed on 14 more depots.

Sl. No.	Depot Name	Charging Points	Details
1	Dwarka Sector 2	6	Combo Fast:3 AC001: 3
2	Dwarka Sector 8	6	Combo Fast:3 AC001: 3
3	Kalkaji Depot	6	Combo Fast:3 AC001: 3
4	Mehrauli	6	Combo Fast:3 AC001: 3
5	Nehru Place Terminal	6	Combo Fast:3 AC001: 3
6	Raj Ghat	8	Combo Fast:3 AC001: 3 DC001:2
7	IP Estate	7	Combo Fast:3 AC001: 3 DC001:1
Total		45	

Charging Points at DTC Depots

5. Need for a Unified Action Plan for Delhi

Delhi has been at the forefront of leading the country's transition to electric mobility. The widespread deployment of public charging stations is critical to Delhi's accelerated EV adoption. Administrative boundaries do not constrain the mobility needs of a state's residents; therefore, planning Delhi's transition to EVs requires an integrated approach. In the context of e-mobility, nowhere does the requirement of this integrated approach assumes more significance than planning the deployment of EV charging stations.

There are three critical aspects of EV charging that mandate the requirement of a unified action plan:

5.1. Integrated Planning: The setting up of EV charging and battery swapping stations requires coordination among the Department of Transport and other transit agencies, the Department of Power, all civic and land-owning agencies, and all the DISCOMs. A unified action plan ensures that EV charging is not planned in silos and does not negatively impact and skew the economics of operating charging stations.

5.2. Access for Consumers: A unified approach to setting and operating charging stations will facilitate easy access to information on processes and usage for a consumer.

5.3. Ease of Doing Business: A unified action plan ensures a facilitative environment for businesses as it brings uniformity in policies, continuity in operations (expansion of charging stations across different administrative areas), and consistency in the processes.

6. Scope of the Action Plan

The action plan aims at developing a unified strategy for deploying EV Charging Stations (EVCS) and Battery Swapping Facilities (BSF) in the National Capital Territory (NCT) of Delhi. It will provide an integrated plan of action for all stakeholder agencies to maintain synergy in deploying EV charging/ battery swapping facilities in the NCT of Delhi. The scope of the action plan includes:

6.1. Setting of public EV charging point targets for the NCT of Delhi

6.2. Defining the approach and guiding principles

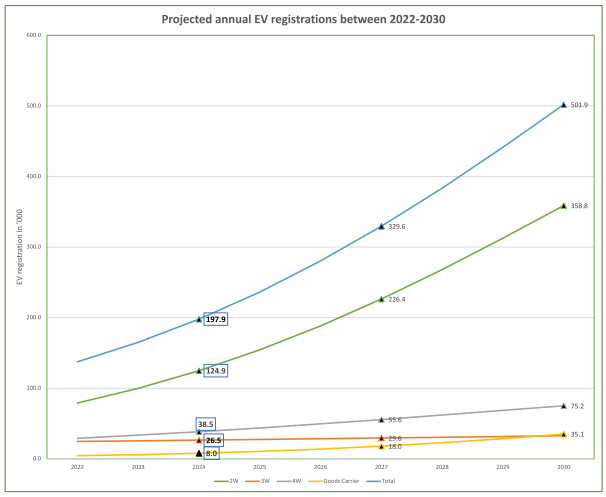
6.3. Identifying all stakeholder agencies

6.4. Chalking integrated plan of action for meeting the targets for EVCS and BSF

7. Public EV Charging Targets by 2024

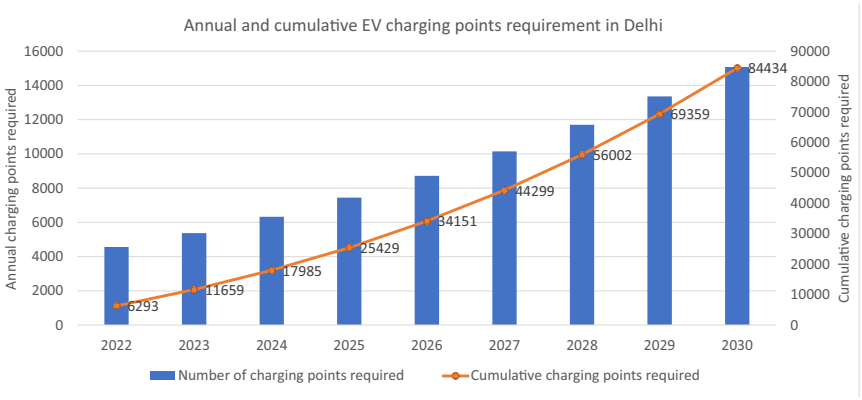
7.1. Delhi will aim to install around 18,000 public and semi-public EV charging points by 2024. To achieve these targets, 5 swapping docks will be considered equal to 1 charging point.

7.2. Delhi's EV charging points target has been set based on EV sales projections for the horizon year 2024. The Delhi EV policy targets 25% of all new vehicle registrations by 2024 to be EV. The projection model uses the Compound Annual Growth Rate (CAGR) in new vehicle registrations for 2014-2019 to project EV sales to achieve the 25% target of EVs by 2024 (aligned to EV policy). The projected cumulative numbers of EVs (segment-wise) can be found below:



7.3. Delhi aims to achieve one public charging point for every fifteen EVs by 2024, spread evenly across Delhi and accessible within 3 km travel from anywhere in Delhi. The need for public charging varies by segment and use case. Taking into account the EV penetration and public charging needs of different vehicle segments and use cases, a charger to EV ratio of 1:15 translates to around 18,000 charging points would be required to cater for the need for (25% of total vehicle registrations) electric vehicles in the horizon year of 2024.

7.4. The year-wise projection of required public EV charging points to support electric vehicles is below:



8. Approach and Guiding Principles

8.1. Approach

i. Identify EV charging/swapping use cases based on charging requirements for different population/market segments, viz., passenger vehicles, fleet owners for passenger and freight, delivery service providers, and public transport vehicles.

ii. Identify priority vehicle segments to determine which type of chargers and solutions to prioritise.

iii. Identify statutory, regulatory, and market impediments to setting up EV charging/swapping stations to determine the policy level and market level action points for facilitating the installation of charging points at scale.

iv. Map EV charging/swapping use cases to parking patterns and identify locations with high dwell time for vehicles.

v. Ensure adequate geographical distribution and installation in un/underserved areas. The latter can be identified in two ways:

- Mapping charging points/swapping stations and EV density to locate spaces where there is a mismatch (inadequate public charging points to service EV numbers),
- Projecting year-wise RTO-wise requirement of charging points and focusing on areas which do not have the required number of charging/swapping points.

1.1. Guiding Principles Behind Deploying Public Charging Infrastructure

i. Align incentives provided to charging solutions for priority vehicle segments (2- and 3-wheelers).

ii. Defray the cost of land by linking lease with revenue and providing upstream electrical infrastructure.

iii. Locations for public EVCS and BSF should have some key features like easy accessibility, electrical infrastructure feasibility, high dwell time for vehicles, access to the EV charging market etc.

iv. 20% of parking spaces in new buildings and 5% of all existing parking spaces under the purview of different agencies must be EV ready with at least 3.3 kW output charging points. Five swap points will be considered equivalent to one charging point.

v. Minimise limiting conditions (like the government determining the service charge or combination of chargers for any site) for the private sector, as the economic viability of EV charging/swapping stations is site-specific

vi. Provide maximum flexibility to the charge point and swapping operators in determining the business model.

vii. Ensure flexibility in defining charger types to be installed to allow for, to the most considerable extent, the adoption of new charging standards as and when they are notified and adopted.

viii. Ensure operationalisation of charging/swapping stations within a fixed period to avoid the possibility of land grabs.

ix. Allow a wide range of stakeholders like charge point operators, battery swapping operators, EV/EVSE/Advance chemistry battery manufacturers, delivery service providers, fleet owners and DISCOMs to participate in the location-allocation process for setting up EV charging/swapping stations.

x. Establish systems that facilitate locating and charging EVs at any public EV charging/swapping station in Delhi.

xi. Establish facilitative systems to install charging points at any feasible location in Delhi easily.

9. Unified Action Plan

9.1. Tenure: The tenure of this action plan is three years from the day it comes into force.

9.2. Stakeholders

The key government stakeholders in ensuring a unified action plan for public and semi-public EVCS deployment in Delhi are:

i. Department of Transport,

ii. Department of Power,

iii. Municipal Corporation(s),

iv. New Delhi Municipal Council (NDMC),

v. Delhi Cantonment Board,

vi. Delhi Development Authority,

vii. All the DISCOMs,

viii. Delhi Metro Rail Corporation,

ix. All land- and road-owning agencies in Delhi,

x. Public Works Departments (PWD and CPWD)

9.3. Action Plan for Public EV Charging:

i. Leveraging Land Parcels

Government agencies across Delhi have land parcels which can be utilised to set up EV charging points. As envisaged in the Delhi EV policy, CPOs shall be invited to set up charging and battery swapping stations across Delhi in multiple phases by porting and providing concessional locations for charging stations. The concessional locations will be aggregated by the State Nodal Agency (SNA) for EV charging infrastructure in Delhi under the aegis of the 'Working Group for Accelerated Roll-out of Charging Infrastructure' constituted by the Department of Power. The guiding principles must be followed for siting and tendering the concessional locations. Learnings from the first phase of implementation should be incorporated into the subsequent phases of the roll-out.

ii. Leveraging Parking Facilities with Civic Agencies

Delhi parking rules 2019 mandate the civic agencies to identify and provide an area for electric vehicle (EV) charging and battery swapping facilities in each parking facility. It further states that the proportion of parking facilities to be demarcated will be assessed by the Transport Department, GNCTD, from time to time, which is likely to increase over time. It should include exclusive night parking places for parking and legal charging of E-rickshaws and other EVs.

To ensure the implementation of this mandate, all civic agencies will demarcate the following proportion of their parking facility for setting up charging points/swapping stations or install the following minimum number of charging points (whichever is more):

Area	Proportion	Minimum Number of Charging Points and/or Swapping Stations	Minimum Number of Battery Swapping Station(s)
<20 ECS	10%	1	–
Between 20 to 100 ECS	20%	4	1
>100 ECS	25%	25	3

Proportion of parking space to be earmarked for EV parking & Charging/Swapping Stations

*ECS: Equivalent Car Space

These mandates translate to an assurance of parking space for any EV user as the demarcated parking space will be exclusively used for parking (and charging) of an EV. The charging point should have a minimum power output of 3.3 kW (AC or DC). If the proportion of ECS is greater than a whole number, then to fulfil this mandate, the number of charging points will be the next whole number.

Example:

Number of ECS = 15

Proportion to be earmarked = 0.10*15 = 1.5 ECS

Minimum space earmarked for parking of EVs = 2

Minimum number of charging points = 2

Five swap points or swapping docks will be equivalent to one charging point to fulfil this mandate.

The area for setting up these charging points must be demarcated within one month of this action plan coming into force and submitted to the State EV Cell of the Department of Transport. The mandates must be fulfilled within six months of this action plan coming into force. One civic agency, on behalf of all civic agencies, will float a unified tender for the installation of charging/swapping points in these parking facilities. For similar unified tenders for different charging use cases on civic body assets, the tendering authority can be selected on a rotation basis. The State EV Cell of the Department of Transport will support the design of the unified tender.

iii. Leveraging Public Infrastructure

Delhi has multiple road and asset-owning agencies. The existing lampposts on those roads utilised for on-street parking can be leveraged to set up kerbside charging.

The State Nodal Agency for EV charging infrastructure should conduct a pilot for setting up kerbside charging on lamp posts. The pilot must be conducted on sections of the road which have on-street parking. It will assess the technical and economic feasibility, the utility for EV users, and the impact on traffic and congestion of kerbside charging. The pilot can be conducted in collaboration with the Public Works Department (PWD). Based on the learnings from the pilot, the SNA will prepare an evaluation rubric for assessing the feasibility of setting up kerbside charging on lamp posts. The State EV Cell will prepare an approach note for the kerbside charging for deliberation and approval by the 'Working Group for Accelerated Roll-out of Charging Infrastructure.'

The SNA, under the aegis of the Working Group, will aggregate feasible sections of roads for EV

charging infrastructure after the pilot phase. Road-owning agencies (like the municipal corporations, PWD, Delhi Urban Shelter Improvement Board, Delhi State Industrial and Infrastructure Development Corporation etc.) shall assess roads used for on-street parking. They will evaluate preliminary feasibility (assessed using the evaluation rubric) for setting up kerbside charging and submit a list of feasible road sections to the SNA. A unified tender, which incorporates the learnings from the pilot, will be floated by the SNA for setting up kerbside charging on the aggregated sections within three months of the launch of this action plan.

iv. Standardisation of the Revenue-Sharing Model

All public EVCS and BSF in Delhi shall follow the revenue sharing model (INR 1/kWh) proposed by the Ministry of Power in the guidelines notified on 14/01/2022 or as proposed in any subsequent amendments to the guidelines. However, the 'Working Group for Accelerated Roll-out of Charging Infrastructure,' in consultation with all the relevant government agencies, can revise this amount to suit the specific needs of Delhi. No revenue sharing model shall be applied retrospectively. Additionally, after deliberation with all the concerned stakeholders, the Working Group can reassess the tendering criteria for allocating public land for setting up charging/swapping stations. For instance, the Working Group can decide to fix the amount of revenue share as the criteria for bidding while standardising the service charge for different charger types and swapping stations set on public land.

v. Discovery of Public EVCS and Ensuring Interoperability

An open, publicly owned database shall be developed by the Transport Department, offering historical and real-time information on public charging infrastructure. It will include kWh, session length, vehicle type if available, number of events, location (latitude, longitude) of the charger, number of chargers at the site, site classification, payment amount, pay structure (by the hour, or by kWh, or by session), as well as payment rate. All public and semi-public charge point operators shall have to provide data to this public database. The database can be used free of charge by in-vehicle navigation systems, charging apps, and maps. The Transport Department will develop a mobile application which ensures the discovery of public EVCS and swapping stations anywhere in Delhi.

Additionally, the Department of Transport will issue a public notice for sharing information about charging/swapping stations in Delhi. The information can be shared through an API which will get dynamically updated in real-time or as static data per the framework to be prepared by the State EV Cell.

Furthermore, the Department of Transport will work with charge point operators to ensure interoperability across public EVCS in Delhi. Interoperability here means a consumer can discover, book, queue, and pay for EV charging on any public EVCS using a single app.

i. Renewable Energy (RE)-Powered EV Charging

The Transport Department will encourage the setting up of EV charging stations powered by renewable energy. It will prepare the approach note for RE charging in consultation with all government and non-government stakeholders. The approach note will provide guidelines to set up RE charging with suggestions on conducting site assessments and leveraging innovative models like virtual net metering and peer-to-peer (P2P) trading, in addition to utilising existing models like open access and gross/net metering. It will be presented to the Working Group for deliberation and approval.

ii. Advertisement Revenue

The land-owning agencies are encouraged to allow monetisation of the EV charging stations by gaining revenue through ads. The land-owning agency can determine the revenue-sharing

arrangement for ad revenue and align it to its existing policies on generating revenue through advertisements on its assets. The Working Group, in consultation with all land-owning and civic agencies in Delhi, will endeavour to develop standardised revenue-sharing arrangements for EV charging/swapping stations in Delhi. Such a standardised arrangement will facilitate floating unified cross-agency tenders, including revenue generation through ads. It will increase earnings for the land-owning agency from the charging/swapping stations and further lower the service charge for EV users in Delhi.

9.4. Action Plan for Semi-Public EV Charging

i. Importance of EV Charging Points in Private and Semi-Public Spaces

Large-scale adoption of electric 2- and 3-wheelers is critical for Delhi's transition as the EV capital of India. With 42% of the vehicular pollution (PM 2.5) in Delhi caused by 2- and 3-wheelers, their adoption is also crucial for reducing vehicular pollution. The biggest hindrance to this large-scale adoption is inadequate charging infrastructure. The unique advantage of an EV is that it is charged when it is idle.

As land is a scarce resource in Delhi, it will leverage existing private and semi-public spaces (like kirana stores, malls, theatres, hospitals, workspaces, group housing societies etc.), which have parking spaces and high dwell time for vehicles. Delhi aims to become among the world's most 'Light EV' friendly cities.

ii. Existing Challenges in Installing EV Charging Points in Delhi

Consumers find it difficult to find reliable chargers in the market that are compatible with different vehicles and are trustworthy products. The installation of EV charging points in Delhi may be hampered by the lack of awareness, the need to deal with multiple stakeholders, the cost of chargers and electrical connections, and a lack of incentives.

iii. Single-Window Process for Installing EV Charging Points

The Delhi government has established a single-window process to install EV charging points on their premises. This single-window process is available online and through a phone call. Through the DISCOMs, the Delhi Government has empanelled vendors who will provide installation of slow and moderate chargers. The step-by-step single-window process to be followed by any consumer in Delhi is as follows:

a. View trustworthy EV chargers on an online platform,

b. Compare the price of different chargers and order them online or through a phone call,

c. Choose to opt for a new electrical connection (including pre-paid meter) to avail reduced EV tariff or continue with the existing connection,

d. Schedule installation at their convenience,

e. Avail subsidy for light EV chargers of up to INR 6000 and pay net of subsidy (consumer does not need to claim for subsidy separately),

f. Pay the entire cost upfront or choose a monthly subscription payment model.

iv. EV Charging Points in Government and other Institutional Buildings

Public Works Department (PWD) and Central Public Works Department (CPWD) will ensure that charging points are set up in at least 20% of the parking space in all central government and

state government offices within six months of this action plan coming into force. The charging points should be set up in parking spaces used for reserved parking for government officials as well as for public parking. The availability of charging points will significantly encourage government officials to adopt electric vehicles.

Delhi Transport Infrastructure Development Corporation Limited (DTIDC) will aggregate demand for charging points from PWD and CPWD for all central and state government office buildings. Two approaches will be followed for the installation of EV charging points in government and institutional buildings:

a. The single-window process will be used for the installation of those chargers which are empanelled by DISCOMs. The State EV Cell will provide the necessary support for installing charging points through the single-window process for the demand aggregated by DTIDC.

b. DTIDC will float a unified tender for these aggregated parking spaces and the respective demand for different charger types.

CPWD and PWD will be free to fix the service charge (which can be zero) for using the charging points. 50% of the revenue obtained through the service charge will be shared with DTIDC. The entire amount received by DTIDC will be contributed to the State EV Fund.

v. EV Charging in Commercial Buildings, Group Housing Societies, and Office Complexes

The Delhi Development Authority notified modifications in the Unified Building Bye-Laws for Delhi, 2016, on February 12, 2020. As per the modifications to Chapter 10 (Provision for Green Buildings), Clause 10.5, Electric Vehicle (EV) charging infrastructure shall be provided in 20% of all vehicle holding/parking capacity at the premise of all new buildings.

For effective implementation of the bye-laws, all relevant agencies will ensure that building plans are approved only if they incorporate the requirement of EV charging infrastructure in at least 20% of vehicle holding capacity. Information on chargers/swapping stations installed will be provided to the Department of Transport on a quarterly basis in the same format used for submitting data to the open database.

Additionally, all existing buildings with a parking capacity of more than 100 vehicles will set aside at least 5% of their total parking capacity for EVs with at least a 3.3 kW output EV charger. Battery swapping stations can also be set up to fulfill this mandate, and five swapping docks will be considered equivalent to one charging point. In cases where the load requirement for installing these charging/swapping stations exceeds the sanctioned load of the building, the buildings must install the least number of chargers/swapping docks possible within the available load. However, buildings are free to apply for increasing the sanctioned load for installing charging points.

vi. EV Parking and Charger Usage Guidelines for Semi-Public Spaces

The Department of Transport will be responsible for formulating the parking and charger usage guidelines for EV charging in semi-public spaces in consultation with all the civic agencies. The same must be formulated and notified within three months of this action plan coming into force.

9.5. Private EV Charging

The chargers for electric vehicles are provided with the vehicle at the time of the purchase. However, several individuals find installing charging points for their private use difficult due to rules enforced by Residents Welfare Associations (RWAs). The RWAs are encouraged to facilitate the installation of EV charging points in their respective areas. Private charging points can be installed using the single-window process set in place by GNCTD.

10. Safety of EV Charging and Battery Swapping Stations

10.1. The safety of vehicles during charging is critical to ensuring customers' trust in EVs. In Delhi, all public EV charging stations will be required to adhere to the provisions provided in the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Amendment Regulations, 2019 and Central Electricity Authority (Measures relating to Safety and Electric Supply) (Amendment) Regulations, 2019. Additionally, EV Supply Equipment (EVSE) for all types of EV charging must be type tested by an agency/lab accredited by approved by National Accreditation Board for Testing and Calibration Laboratories (NABL) from time to time.

10.2. The testing of EV chargers and Battery Swapping units must be done per standards published by the Department of Science and Technology (DST)/ Bureau of Indian Standards (BIS) or as per the Battery Swapping Policy of the Government of India as and when notified. The latest Indian Standards for EV charging notified by BIS as of 01.11.2021 are provided in Annexure III of 'Charging Infrastructure for Electric Vehicles (EV) - the revised consolidated standards and guidelines – reg' published on January 14, 2022, by the Ministry of Power, Government of India.

10.3. Till the time suitable type testing parameters are notified by the Government of India or the Government of NCT of Delhi, all battery swapping facilities must type test their products against the following parameters:

Sl. no.	Parameter	Test	Test Standard	Reference clause
1	Verification of performance & Safety Functions	Functions like Verification that the swappable battery is connected correctly	IEC 61851-3-3	Annex A
		Protective conductor continuity checking	IS17017-1	6.3.1.2
		Energization De-energization of the system	IS17017-1	6.3.1.4;6.3.1.5
		Locking of the swappable battery during charging	IEC 61851-3-3	Annex A
		Compatibility assessment for individual battery channel	IEC 61851-3-3	Annex A
		User-initiated shutdown	IS17017-1	15
		Input AC overvoltage protection	IS17017-1	8
		Fault protection, indication and monitoring	IEC 61851-3-3	Annex A
		Protection against electric shock	IS17017-1	8
		Dielectric withstand characteristics	IS17017-1	11.3
		Insulation resistance	IS17017-1	12.5
		Residual current protective devices	IS17017-1	8.5

Sl. no.	Parameter	Test	Test Standard	Reference clause
2	Environment tests	Minimum temperature functional test	IS17017-1	12.10.1
		Maximum temperature functional test	IS17017-1	12.10.2
		DAMP HEAT FUNCTIONAL TEST	IS17017-1	12.9
		Degrees of Protection Against Solid Foreign Objects and Water for the Enclosures:	IS17017-1	12.4.1
3	EMC tests	Immunity to electrostatic discharges	IS17017-21-2	
		Fast transient bursts		
		Voltage surges		
		Voltage dips and interruptions		
		Immunity to radiated electromagnetic disturbances		
		Conducted Emission		
		Harmonic Emission		
		Flicker Emission		
		Radiated Emission		
5	Mechanical impact	Impact test	IS17017-1	12.11

11. Impact of EV Charging on the Grid

The accelerated adoption of EVs in the NCT of Delhi will result in the installation of a large number of charging points. The impact of EV charging on grid management needs to be studied. The DISCOMs of Delhi will undertake joint studies to assess the impact of EV charging and suggest measures to mitigate the negative impacts of EV charging on the grid. The Department of Transport will work with DISCOMs to recommend measures like 'time-of-day' tariffs and 'managed charging' to the regulatory commission.

12. Incentives for EV Charging/ Battery Swapping

The Delhi EV policy provides a capital subsidy for setting up public charging stations in Delhi. Additionally, it provides subsidies for 30,000 slow charging points. The policy also provides operational incentives in the form of special EV tariff. All stakeholder agencies are recommended to consider providing subsidies in line with the mandate of the Delhi EV policy. The agencies are free to provide any additional incentives over and above the incentives provided under the Delhi EV policy.

13. Battery Swapping

13.1. Delhi has taken a technology/solution-agnostic approach to charge EVs. It has ensured that all solutions, including battery swapping, have equal footing, and the selection of solutions is left to the market/consumer.

13.2. In India, battery swapping can evolve as a feasible solution for electric 2- and 3-wheeled vehicles, which comprise the country's highest share of EVs. The solution allows a customer to purchase an EV without a battery, which substantially reduces the EV's cost (batteries typically cost 40-50% of the total EV cost). It also delinks the EV user from risks of battery degradation. Therefore, battery swapping as a solution can be a crucial enabler in accelerating India's e-mobility transition.

13.3. Delhi will continue with this approach, providing equivalent fiscal and non-fiscal support to BSF and EVCS. Delhi will also align future measures with the draft of the battery swapping policy published by NITI Aayog on April 20 2022, and with any subsequent amendments.

13.4. Towards ensuring a solution agnostic approach, Delhi will operationalise the incentive provided to battery swapping facility operators in the Delhi EV policy. If the battery is not sold with the vehicle, up to 50% of the purchase incentive would be provided to energy operators to defray the cost of any deposit that may be required from end users for using a swappable battery. Vehicle manufacturers will be encouraged to register their swappable models separately. It is required because battery capacity for the same vehicle model is different for swappable and non-swappable vehicles, and the purchase incentives are indexed to battery capacity. For administrative ease, vehicle and battery manufacturers will be encouraged to apply for incentives as a consortium, and incentives will only be provided to the lead member of the consortium.

Annexure A
Summary Table for Action Points of Stakeholder Departments and Agencies

Sl. No.	Stakeholders	Action Points
1.	Working Group for Accelerated Roll-out of Charging Infrastructure in Delhi	• Monitoring the implementation of the action plan • Design and recommend the approach for tendering out land parcels for EVCS • Deliberation and approval of the approach note for tendering out civic assets for kerb side charging • Develop standardised advertisement revenue sharing agreements for EVCS/BSF in Delhi
2.	Department of Transport	• Nodal department for the implementation of the action plan • Design the tender for setting up charging points in parking facilities of urban local bodies • Identify unserved and underserved areas • Roll out of the open database and set in place a mechanism to submit/obtain data to the same • Create communication protocols for ensuring interoperability • Roll-out of a single platform (app) for the discovery of EVCS/BSF + booking, queueing, and payment for charging • Create approach notes and guidelines for deploying kerb side and RE-powered EV charging stations • Support the installation of charging points in government/institutional buildings. Design unified tender. • Formulate the parking and charger usage guidelines for EV charging in semi-public spaces
3.	Department of Power (including SNA)	• Aggregate land parcels for setting up public EVCS/BSF • Float tender for setting up public EVCS on these land parcels • Implement pilot and float unified tender for kerbside charging
4.	Municipal Corporation(s) + NDMC + DCB	• Demarcate mandated space in all parking facilities for EV charging within **one month** of the action plan coming in to force • Submit the demarcated area to the Transport Department • Float unified tender for setting up charging points on the demarcated area • Implement the mandate **within six months** of the action plan coming in to force • Develop and implement revenue sharing agreements for revenue generated from advertisements in their respected areas • Approve building plans only if they adhere to EVCS requirement (20% of parking capacity) in the building bye-laws • Ensure implementation of 5% parking space to be EV ready in buildings with parking capacity of more than 100 vehicles within six months of the action plan coming in to force • Submit data pertaining to EVCS to the open database in the format provided by the Department of Transport.

Sl. No.	Stakeholders	Action Points
5.	All the DISCOMs	• Empanel vendors for single-window process • Set in place a single-window mechanism for installation of chargers in semi-public and private spaces • Work out the impact of EV charging on grid management and recommend measures for ensuring grid/systems upgradation and efficient charging practices.
6.	All land- and road-owning agencies in Delhi	• Provide land parcels for setting up of public EVCS • Conduct feasibility analysis and submit a list of roads where kerbside charging can be deployed
7.	Public Works Department (PWD and CPWD)	• Ensure charging points are set up in at least 20% of the parking space in all Central Government and Delhi Government buildings **within six months** of the action plan coming into force.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