

Amendments in
Urban and Regional Development Plans
Formulation and Implementation Guidelines
(URDPFI - 2014)
for
Electric Vehicle Charging Infrastructure

Town and Country Planning Organisation
Ministry of Housing and Urban Affairs
Government of India

February, 2019

Preamble

To encourage “Electric Vehicles” as a viable option for long distance trips / inter regional trips with adequate “charging stations”, it is necessary to make provisions for establishing Public Charging Stations (PCS) in the regional facilities for re-fuelling/recharging of vehicles.

Hence, amendments are required for addition of norms for charging Infrastructure provisions in Development Control Regulations and provide “*Charging Infrastructure*” in the City Mater Plans / Regional Plans.

Based on available charging technologies and their evolution, type of vehicles, the types of chargers indicating number of charging points required for setting up adequate PCS as regional facilities and with the long term vision of implementing ‘electric mobility’ during the next 30 years, amendments are made **Under Chapter 8: Infrastructure Planning, at section 8.4.7 “Distribution Services”**, Table 8.57 – “Norms for Distribution Services” of URDPFI Guidelines, 2014 (Volume I) as detailed in clause 3 of this document.

2. Existing provision in Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI, 2014)

Chapter 8: Infrastructure Planning (Volume I of URDPFI Guidelines 2014)

At section 8.4.7 “Distribution Services”,

Table 8.57 – “Norms for Distribution Services”

Sr. No.	Category	Population served per unit	Land Area Requirement		Other Control
			Type of facility	Area requirement	
1.	Petrol/Diesel filling and Service Centre				
	Permitted in:		i. Only filling station	30m x 17m	<ul style="list-style-type: none"> Shall not be located on road having Right of Way less than 30m.
	Central District		ii. Filling cum service station	36m x 30m	
	Sub central district				<ul style="list-style-type: none"> Special cases in old city areas may be considered based on the approval by statutory authorities.
	District centres		iii. Filling cum service station cum workshop	45 x 36m	
	Community Centres (Only Filling Station)			18m x 15m	
	Residential & industrial Use Zone in Urban Areas		iv. Filling station only for two and three wheelers		<ul style="list-style-type: none"> Shall be approved by the explosive/ fire department.
	Along National and State Highways				
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				
	Police/security forces services (for captive use only) (MPD, pg 125)				
2.	Compressed Natural Gas (CNG)/filling centre				
	Permitted in:		CNG mother station	1080 sqm	<ul style="list-style-type: none"> Shall not be located on road having Right of Way less than 30m.
	All use zones (except in Regional Parks and Developed District Parks)		(Including building component - control room/office/dispensing room/store, pantry and W.C.)	(36m x 30m)	
	Along National and State Highways				<ul style="list-style-type: none"> Shall be approved by the explosive/fire department.
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				
3.	LPG Godown/Gas Godown	40,000 to 50,000	Capacity = 500 cylinders or 8000 kg of LPG Area (inclusive of guard room)	520 sqm (26m x 20m)	<ul style="list-style-type: none"> The major concern for its storage and distribution is the location, which shall be away from the residential areas and shall have open spaces all around as per the Explosive Rules.
4.	Milk Distribution	5000	Areas inclusive of service area	150sqm	---

3. Amendments to URDPFI Guidelines 2014:- Necessary provisions for EV Charging have been incorporated at Sr. No. 1 and Sr. No. 3 of table 8.57. The revised table will be as under:

Table 8.57 – “Norms for Distribution Services”:

Sr. No.	Category	Population served per unit	Land Area requirement		Other controls
			Type of Facility	Area required	
1.	Petrol/Diesel filling/EV charging* and service centre				
	Permitted in:		i. Only filling station	30m x 17m	<p>Shall not be located on road having Right of Way less than 30m.</p> <p>Special cases in old city areas may be considered based on the approval by statutory authorities.</p> <p>Shall be approved by the explosive/ fire department.</p> <p>Charging station and all equipment layout with respect to nearest dispensing unit (DU)/fuel tank to be as per PESO rules.</p> <p>Equipped with CCE and LCC, as required in addition to requirements of PCS.</p> <p>Optional addition to PCS by the SP</p>
	Central District		ii. Filling cum service station	36m x 30m	
	Sub central district		iii. Filling cum service station cum workshop	45 x 36m	
	District centres		iv. Filling station only for two and three wheelers	18m x 15m	
	Community Centres (Only Filling Station)		v. Public Charging Station (PCS) (minimum requirement as per MoP guidelines)	Min. 13.5m x 5.5m	
	Residential & industrial Use Zone in Urban Areas		vi. FCB CS 1 CCS 1 CHAdeMO	Min. 15m x 7m	
	Along National and State Highways		vii. Battery Swapping Station (optional)	Earmarking area for “battery fitting”	
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				
	Police/security forces services (for captive use only) (MPD, pg 125)				
2	Compressed Natural Gas (CNG)/filling centre				
	Permitted in:		CNG mother station (Including building component - control room/office/dispensing room/store, pantry and W.C.)	1080 sqm (36m x 30m)	<p>Shall not be located on road having Right of Way less than 30m.</p> <p>Shall be approved by the explosive/fire department</p>
	All use zones (except in Regional Parks and Developed District Parks)				
	Along National and State Highways				
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				

Sr. No.	Category	Population served per unit	Land Area requirement		Other controls
			Type of Facility	Area required	
3.	Standalone Public Charging Stations (PCS)				
A	Public Charging Stations	Every 25 Kms, both sides along the highways/roads	PCS with charger ratio (minimum requirements of PCS, as per MoP) - 1 FC for every 10 EVs 1 SC for every 3 EVs	Additional area as per total parking capacity at the Restaurants /Eateries.	Equipped with CCE and LCC, as may be required for fast charging.
B	Fast Charging facility / FCB CS (for Long Distance & Heavy Duty EVs)	Every 100 Kms, both sides along the highways/roads	At least 2 chargers 1 CCC type 1 CHAdeMO type (min 100KW each)	Min. 15m x 7m	May be coupled with the PCS at item A above, with CCE and LCC.
C	Battery Swapping Station	Optional provisions as per MoP Guidelines.	Standalone Provided along with FBC charging Stations	Min 5.5m x 2.75m	May be coupled with PCS at item A or FCB CS at item B above.
4	LPG Go down/ Gas Go down	40,000 to 50,000	Capacity = 500 cylinders or 8000 kg of LPG Area (inclusive of guard room)	520 sqm (26m x 20m)	The major concern for its storage and distribution is the location, which shall be away from the residential areas and shall have open spaces all around as per the Explosive Rules
5	Milk Distribution	5000	Areas inclusive of service area	150sqm	---

* A detailed explanation is given at **Appendix 'P' – "Explanatory Note on EVCI"** and **Appendix 'Q' – "Guidelines issued by Ministry of Power on EVCI, dated 14.12.2018"** (in Volume IIA & IIB).

Notes:

- *Super Kerosene Oil/Light Diesel Oil storage for industrial uses shall be given separately.*
- *Large petrol/diesel storage centers to be located outside city limits.*
- *To be organized by a service provider for connection and metering, available 24x7for all users.*
- *Provision of FCB CS & BS shall not be mandatory, and will be at the discretion of the service provider.*
- *Size recommended for FCB CS is subject to variance as per technical specifications of the SP.*
- *Fuel filling stations (including COCO outlets) shall conform to specifications and safety norms as per the amendment in Petroleum Rules or, PESO Act and obtain clearances as maybe necessary from the 'Competent Authority', for adding PCS to Retail outlets/ Fuel filling stations.*

For Standalone PCS:

- *The ratio of provision of charging points (FC/SC) with respect to total parking capacity will be considered for only 20% (i.e. 20% of total parking capacity will be considered EVs & ratio will be applied on them)*
- *Land allocation is preferably to be contiguous/in close proximity to commercial land of the Mid-way Restaurant.*
- *"General Conditions of Siting" of Standalone PCS shall follow clause 4.1-4.4 of IRC:12 (latest revision) except for the distance between stations which shall be as per the Guidelines issued by MoP, dated Dec, 2018.*

Abbreviations used:

2Ws	- Two wheelers
3Ws	- Three wheelers
4Ws	- Four wheelers / PV(cars)
PVs	- Passenger Vehicles
CVs	- Commercial Vehicles
EV	- Electric Vehicle
SC	- Slow Charger / Slow Charging (AC)
FC	- Fast Charger / Fast Charging (DC and a few AC ones)
BS	- Battery Swap
PCS	- Public Charging Stations
URDPFI	- Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014
CCS	- Combined Charging System
CHAdeMO	- A DC Fast charging standard
FCB CS	- Fluid Cooled Battery Charging Station
CCE	- Climate Control Equipment
LCC	- Liquid Cooled Cables
NSP	- Network Service Provider (information network)
SP	- Service Provider

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Explanatory Note
on
Electric Vehicle Charging Infrastructure
(For URDPFI Guidelines 2014)

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Abbreviations:

UNFCC	-	United Nations Framework Convention on Climate Change
IPCC	-	Intergovernmental Panel on Climate Change
GHG	-	Green House Gases
2Ws	-	Two wheelers
3Ws	-	Three wheelers
4Ws	-	Four wheelers / PV(cars)
PVs	-	Passenger Vehicles
CVs	-	Commercial Vehicles
EV	-	Electric Vehicle
EVSE	-	Electric Vehicle Supply Equipment
SC	-	Slow Charger / Slow Charging (AC)
FC	-	Fast Charger / Fast Charging (DC and a few AC ones)
BS	-	Battery Swap
PCS	-	Public Charging Stations
PCI	-	Public Charging Infrastructure
Private CI	-	Private Charging Infrastructure
MBBL	-	Model Building Bye-Laws, 2016
URDPFI	-	Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014
NSP	-	Network Service Provider (information network)
SP	-	Service Provider

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1. Rationale for EVCI establishment

Rapid urbanization coupled with adoption of mechanized transportation modes has resulted in high emissions of Green House Gases that goes on to impact Global warming. Unless, the global surface temperature rise is restricted to no more than 2°C compared with pre-industrial levels, the IPCC has warned that the world will see irreversible catastrophic climate change.

India being a signatory to the UNFCCC, has pledged for efforts to assess the Greenhouse Gas Emissions (GHG) of anthropogenic origin and removal by sinks. India's per capita emissions are still considered low at 1.9 tonnes (2013), but its total emissions are next only to China and the US and is likely to overtake those of the EU by 2019.

While comparing the Indian cities for their emission scores, Delhi is on top as the biggest emitter at over 38 38 million tonnes of carbon dioxide equivalent overall emissions, followed by Greater Mumbai at 22.7 million tonnes and Chennai at 22.1 million tonnes, Kolkata at 14.8million tonnes, Bangalore at 19.8million tonnes, Hyderabad at 13.7 million tonnes and Ahmedabad at 9million tonnes were the other cities whose emissions for the year were calculated sector wise.

As per the statistics of Transport Department (GNCTD), total number of vehicles in Delhi is more than the combined total vehicles in Mumbai, Chennai and Kolkata. Delhi has 85 private cars per 1000 population against the national average of 8 cars per 1000 population. In terms of CO₂ emissions due to motor vehicles, Delhi emits about 12.4 million tonnes while the city of Bengaluru emits about 8.6 million tonnes.^[1]

Therefore, addressing the quantum of emissions from the “Transport” and “Domestic” sector emerges to be the high priority subjects under the overarching umbrella of “*Climate change mitigation*” as committed to the UNFCC.

Encouraging “Electric Vehicles” as a viable option for phased transportation in terms of short and long distance trips with appropriate “Charging Infrastructure” is therefore, the pre-condition for this paradigm shift / phased migration to sustainable transportation.

For this changes are required in Infrastructure provisions (at Regional and City levels) and in Development Control Regulations (in terms of provisions therein) to include the formulations of norms and standards for “*Charging Infrastructure*” in the said Mater Plan Regulations and State Bye-Laws for adoption across the country suiting local conditions.

2. EV Charging Technology

2.1 Electric Vehicle Supply Equipment (EVSE):

An EVSE is a wall mounted box that supplies electric energy for recharging of electric vehicle batteries. Also EVSEs have a safety lock-out feature that does not allow current to flow from the device until the plug is physically inserted into the car.

EVSEs can be customized with added features like:

- Authentication
- Integrated payment gateways
- Software for remote monitoring.

As electric vehicle charging technology continues to advance, several standards and guidelines have become widely accepted across the industry. This section gives a brief overview of charging infrastructure technology, standards, and terminology.

2.2 Different types of EVSE:

Charging speeds- Charging power, which determines the time required to charge a vehicle, can vary by orders of magnitude across charge points, as shown in Table 1. A small household outlet may charge as slowly as 1.2 kW, while the most advanced rapid charging stations can charge at up to 350 kW. Charging infrastructure is broadly broken into three categories based on speed: Level 1, Level 2, and direct current (DC) fast charging (sometimes referred to as Level 3).

(Source: "Emerging Best Practices for Electric Vehicle Charging Infrastructure", Oct' 2017)

Private Charging

Charging batteries of privately owned cars through domestic charging points. Billing is mostly part of home/domestic metering.

AC "Slow" Charging:

The home private chargers are generally used with 230V/15A single phase plug which can deliver a maximum of up to about 2.5KW of power. The EVSE supplies AC current to the vehicle's onboard charger which in turn converts the AC power to DC allowing the battery to be charged.

Public Charging

For charging outside the home premises, electric power needs to be billed and payment needs to be collected. The power drawn by these chargers may need to be managed from time to time.

DC "Fast" Charging:

DC current is sent to the electric car's battery directly via the charge port. FC chargers (usually 50 KW or more) can supply 100 or more kilometers of range per hour of charging. The fast chargers would generally be used as a top-up, rather than fully charging vehicles. These are important for cab companies and corporate users who have a fleet of electric cars.

3. Options for EV Charging

There is an urgent need to offer flexible charging infrastructure for different vehicle segments to drive adoption of EVs. Charging infrastructure is the most crucial enabler in the entire EV value chain. The exploration of different charging models according to the local conditions shall enable faster deployment of electric vehicles in the country.

EV share in all vehicles - It has been broadly projected that by the current rate of adoption of EVs, about 15% of all vehicles in the country would be EVs by the year 2020. Therefore, while assuming percentage composition of all proposed capacities in Public facilities of vehicle holding capacity, the Metropolitan and 'Tier I' cities will be assumed to have a higher percentage share of EVs, say **20% for now**. The charging infrastructure prescriptions in all urban development guidelines shall, therefore, be in consonance with the said percentage.

Power Load sanction to premises – While adding these Charging Infrastructures to the proposed set of building types of the Indian cities, **enhanced Power Load shall have to be had for each such building type by the Power DISCOMs**, commensurate to the total additional power requirement of simultaneous operation of all the prescribed charging points in the premise. With further advancement of charging technologies and the enhanced capacity of chargers to draw more power, it is advised that the **load capacity assigned to each premise should be kept with a safety factor of 1.25** with a long-term vision of 30 years.

Table 1: EVs charging “modes” and ‘availability’

Vehicle type	Slow Charging	Fast Charging	Public CI
2 Wheelers	Y	N	Yes/Limited
3 Wheelers	Y	N	Yes/Limited
PVs (Cars)	Y	Y	Yes
PVs (Buses)	N	Y	Yes

Table 2: Charging options for EV types (by ownership)

Vehicle type	Private CI	Public CS	Predominant place of charging
2 Wheelers	SC/BS	SC	Point of residence / Work
3 Wheelers	SC/BS	SC/BS	Residence / Parking stations
PVs (Cars)	SC/BS	FC	Residence / Point of work / other public places
PVs (Buses)	-	FC/BS	Bus Terminals/Depots

Note:

- The option of Battery Swapping (BS) for privately owned 2Ws and PV(Cars) is limited to Private CI.
- For 3 Ws the BS is proposed to be made available in PCS, for faster recharge experience only
- For PV (Buses), Captive Fast charging infrastructure for 100% internal use for fleets may be adopted by privately owned Depots/Garages.

Based on the above stated EV charging technologies available and the current trend of evolving technologies of faster charging experience, the Ministry of Power has issued ***Guidelines and Standards for setting up Charging Infrastructure for Electric Vehicles*** [Ministry of Power (MoP) Guidelines dated 14.12.2018] for charging infrastructure to be installed at every Public Charging Station (PCS). 'Connectivity regulations and Safety norms' shall be defined by respective authorities such as Central Electric Authority/MoP for grid access to such PCS / any other charging station/infrastructure.

4. Charger Specifications and PCS Infrastructure

Any installed PCS shall have one or more electric kiosk/boards with installation of all charger models as prescribed in the **Guidelines and Standards notified by Ministry of Power (MoP), dated 14 December 2018 for "Charging Infrastructure for EVs"** (at Annexure II), with other necessary arrangements as deemed necessary.

Public Charging Station service providers shall be free to create charging hubs and to install additional number of kiosk/chargers in addition to the minimum chargers prescribed vide the MoP Guidelines, including options for installation of additional chargers, if required.

Note:

- *Minimum infrastructure requirements do not apply to Private Charging Points meant for self-use of individual EV owners (non-commercial basis).*
- *Captive charging infrastructure for 100% internal use for a company's own fleet will not be required to install all type of chargers and to have NSP tie ups.*

5. Regional location of PCS / FCB Charging Stations

In accordance with the Guidelines issued by the *Ministry of Power*, following minimum standards with regard to density of / distance between PCS in regional level facilities shall be followed as and regulated by the URDPFI Guidelines-

1. Along Highways and inter-city corridors:

- At every 25 Kms on both sides of highways/roads, at least 1PCS is to be set up.
- At every 100 Kms on both sides of highways/roads, at least 1 Fast Charging/FCB Charging Station as per specifications. (may be coupled with PCS)
- Standalone Battery Swapping Stations may be added with the PCS.

2. In Regional level Industrial SEZs / other Industrial Parks/Estates

- Land for at least 1PCS is to be reserved within a grid of 10 Km x 10 Km of the designated industrial area/park/estates.

Appendix Q (MoP Guidelines) to be added to URDPFI Guidelines 2014 (Vol IIA and IIB) - being pdf document has been made available in the attachment section.