



# **Parking Management Area Plan for National Capital Territory of Delhi: A Guidance Framework**

**Transport Department, Government of National Capital Territory of Delhi**

**November 2017**

## **Contents**

1. Mandate of Parking Management Area Plan (PMAP).....	4
2. What is Parking Management Area Plan (PMAP)? .....	4
2.1. Process for preparation and implementation of PMAP: .....	6
2.1.1. Site visit & development of ‘rough sketch’ of existing situation in consultation with all stakeholders on site:.....	6
2.1.2. Preliminary Plan prepared based on PMAP Guidelines (Section 2.2):.....	6
2.1.3. Discuss preliminary plan with stakeholders and get in-principle agreement of key stakeholders.....	6
2.1.4. Correction / modification after detailed Parking Area Plan: .....	6
2.1.5. Implementation of PMAP after issue of public notice and due approval of Competent Authority and House .....	6
2.1.6. Implementation of PMAP in two steps: .....	6
2.2. GUIDELINES FOR PREPARATION OF PMAP:.....	7
2.2.1. How to delineate and demarcate PMAP? .....	7
2.2.2. Evaluation of ground situation .....	7
2.2.3. Residential areas.....	8
Steps to follow for preparing PMAP for Residential Areas: .....	8
2.2.4. Commercial areas .....	9
Steps to follow for preparing PMAP for Commercial Areas: .....	9
2.2.5. Criteria for provision of new Shared Parking facilities: .....	10
2.3. Contractual Considerations for Parking Operator (Contractor):.....	11
2.4. Monitoring, Management and Enforcement of PMAPs: .....	11
3. Notification of more parking sites as per approved PMAP .....	12
4. Benefits to End Users *** .....	12
5. General Rules.....	13
6. Parking pricing strategy (This section will be further refined based on the detailed guidelines being developed by the parking pricing sub group).....	13

## **List of Annexures**

Annexure - I: Order of prioritization in planning for public space and location of Parking facilities .....	16
Annexure - II: Guidelines and thumb-rules for allocation of parking spaces.....	17

Annexure - III: Norms and Standards as per MPD-2021 .....	19
Annexure - IV: PRICING & SHARED PARKING THUMB-RULES .....	21
Annexure - V: STRATEGY FOR PROVISION OF MULTI LEVEL/ STACK PARKING FACILITIES .....	22
Annexure - VI: DESIGN GUIDELINES FOR PARKING FACILITIES .....	23

### **List of Tables**

Table 1: Master Plan of Delhi-2021; Table 12.8: Guidelines for multimodal integration at metro stations.....	19
Table 2: Parking Standards (as per MPD-2021 and other Codes).....	19
Table 3: (MPD-2021, Table 17.3) Space Standards for Car Parking.....	20
Table 3: Pricing Strategy for on-street parking .....	21
<i>Table 3: Shared Parking Possibilities: .....</i>	21
<i>Table 3: Peak parking demand for different land use type and opportunity for sharing: .....</i>	21
Table 4: Criteria for provision of multi-level/ stack parking facilities:.....	22

### **List of Figures**

Figure 1: Emergency vehicle access on various types of neighbourhood roads CHECK cross sections 3 and 4 .....	20
Figure 2: Structured parking with street level active uses .....	23

## 1. Mandate of Parking Management Area Plan (PMAP)

As per the **Delhi Maintenance and Management of Parking Rules of 2017** notified under the clause 41 of section 2 to be read with Section 117, sub-section 3 of Section 127 and clause (e) (h) and (i) of sub-section 2 of Section 138 of the Motor Vehicle Act, 1988 (59 of 1988) as well as the Master Plan for Delhi 2021 (MPD 2021), the National Capital Territory (NCT) of Delhi is required to implement **Parking Management Area Plan**.

The MPD 2021 has provided for Parking Management District (PMD) Plan that has been adapted for rules as Paring Management Area Plan (PMAP). According to the MPD 2021 parking management must be effectively used as a tool to reduce overall demand for parking space (chapter 12: Transportation). The objective of Parking Management District or PMAP is to provide comprehensive facilities for all modes including pedestrians, NMT, cycle tracks, NMT and IPT parking, vending zones, bus stops, public amenities, etc. in addition to on-street and/or off-street parking for private vehicles.

These plans aim to improve availability of on-street and off-street parking and promote greater walking, cycling and public transport use. A PMD as per MPD 2021 provides more net available parking space in an area by increasing parking turnover through good design, management and pricing strategies. A portion of the revenue generated could be used for local improvement of footpaths, cycle-tracks, and maintenance of facilities with involvement of the local communities. According to MPD 2021 user pay principle should govern the pricing of parking.

In line with the requirements of MPD 2021 and Delhi Maintenance and Management of Parking Rules of 2017, the following guidelines have been prepared to guide the Urban Local Bodies (ULBs) and other concerned agencies about the implementation of PMAP.

This guidance is divided into two parts:

- Part 1 lays down the guidelines for the implementation of the PAMP;
- Part II demonstrates application of PAMP principles in real world situation. For this purpose Lajpat Nagar a prominent and busy commercial area in South Delhi has been selected and based on ground survey along with the stake holders and shopkeepers association has prepared a plan with design to apply PAMP guidelines.

## 2. What is Parking Management Area Plan (PMAP)?

**The Parking Management Area Plan (PMAP)** is an area level plan prepared by any local body which includes the demarcation of all types of parking spaces for all mode as well as essential street amenities as per MPD-2021 provisions. This includes on-street<sup>1</sup>, off-street<sup>2</sup> and multi-level parking facilities, vending zones, multi-modal integration facilities, green open spaces along with the allied traffic and pedestrian/ NMT circulation plans, signage plans and pricing strategy.

<sup>1</sup> On-street parking = parking spaces demarcated within the Right-of-Way

<sup>2</sup> Off-street parking = Parking spaces demarcated in parking lots lying outside Right-of-Ways

PMaps must be prepared in consultation with local stakeholders, planning bodies/departments and with a team of transport planners and urban designers, and should include the following:

- a. Traffic circulation/ dispersal plan along with road geometry and walkability improvements with universal accessibility and provision of street amenities as per MPD-2021;
- b. Demarcation of all available roadspace for requisite uses as per Annexure-I, as well as off-street parking facilities for both public and private modes within the area, along with numbering, marking and signage plan. Adequate space for all components as per **Annexure-I**, need to be demarcated.
- c. Detailed design for surface, multi-level and on-street parking facilities along with the indicative location of pedestrian areas, vendors (where applicable), public amenities/toilets/utilities, green open spaces on/ along all roads and areas that are part of the PMap;
- d. Demarcation of short term<sup>3</sup>and long term<sup>4</sup> parking facilities and their pricing strategy;
- e. Where shared Multilevel Parking facility is provided, the following is to be demarcated:
  - (i) Ingress-egress plan and ensuring that no major disruption occurs on main thoroughfare traffic.
  - (ii) Pedestrian circulation plan that shows connections and walkways between parking areas and different uses. These paths should be as direct and short as possible, and should have barrier free design.
  - (iii) A signage plan;
  - (iv) A safety and security plan that addresses lighting, access and maintenance of the parking areas and streets within the PMap area.

---

<sup>3</sup>Short term Parking = Parking priced in such a way as to discourage parking more than 3 hours

<sup>4</sup>Long term Parking = Parking priced in such a way as to incentivize use more than on-street parking

## 2.1. Process for preparation and implementation of PMAP:

- 2.1.1. Site visit & development of 'rough sketch' of existing situation in consultation with all stakeholders on site:
- 2.1.2. Preliminary Plan prepared based on PMAP Guidelines (Section 2.2):
- 2.1.3. Discuss preliminary plan with stakeholders and get in-principle agreement of key stakeholders.
- 2.1.4. Correction / modification after detailed Parking Area Plan:
- 2.1.5. Implementation of PMAP after issue of public notice and due approval of Competent Authority and House
- 2.1.6. Implementation of PMAP in two steps:

### (a) Infrastructure Tenders – in case of MLCPs/stack parking:

- 1 Tender 1 - for creation/ demarcation of off-street Parking facilities as per approved PMAP, to be handed over to DMCs after construction.
- 2 Tender 2 after 6 months of implementation of (b) Management Contract - Implement street walkability and road geometric improvements including universal accessibility & street lighting as per codes.

### (b) Engagement of Single Management Contractor:

- Tender for allotment of combined Management Contract for both on-street and off-street parking (including MLCP/stack parking handed over to DMCs) within the notified PMAP;
- Demarcate all on-street spaces (by mode) on ground and install signage, lighting, pricing information, PIS and monitoring infrastructure (eg CCTV etc.)
- Management agency employed by DMCs to have power to enforce/challan violators ? – **role of local bodies and Police to be defined.**

### (ii) Long-term Management of the PMAP Area:

- (a) **At least 25%** of the collected parking charges from with the PMAP area and undertake improvement and regular maintenance of footpaths, public amenities and parking facilities within the PMAP area (as per MPD 2021).
- (b) In residential areas and within off-street parking facilities, regular parkers may apply for monthly annual passes and stickers, for use of public parking space and these may be monitored through RWAs or surprise checks.
- (c) **Penalty for illegal/wrong parking esp. parking within the emergency lanes is to be prohibitive.**

## 2.2. GUIDELINES FOR PREPARATION OF PMAP:

### 2.2.1. How to delineate and demarcate PMAP?

- (i) Demarcate PMAP boundary based on areas bounded by major roads on all sides; should preferably include a variety of land-uses. Also delineate based on natural boundaries like forest, district parks or any other major physical barriers that divide neighbourhoods.
- (ii) While delineating the PMAP indicate the area on the relevant zonal plan and map out land use pattern in the PMAP area. Also indicate the jurisdiction of the relevant urban local body or any other land owning agency.

### 2.2.2. Evaluation of ground situation

- (i) Evaluate ground situation as per Table 1, Annexure II, noting the following:
  - a. Any Metro station within the Plan area? If yes, then multi-modal integration norms (MMI) norms as per MPD-2021 takes priority within 100 m (Annexure III).
  - b. Identify all Metro stations, bus stops, bus bays, para transit access, pedestrian crossing, fire hydrants, loading zones, taxi stands, driveways, electric charging areas, public toilets, amenities, bike sharing facilities and other features that are likely to affect the use of the street for parking. Document traffic management measures in force, such as prohibited turns, one way streets, exclusive bus lanes etc. Identify the gated streets, service and rear-access alleys.
  - c. Through parking space inventory survey approx. mark all the areas where parking (by mode) is taking place or can take place (Annexure-I) in addition to essential amenities:
    - On-street parking: Total length of kerb and lengths governed by no waiting and limited waiting restrictions.
    - Off-street parking lots
    - Public toilets
    - Vendors/ vendor zones
    - MLCPs/ Stack parking
    - Parking within buildings (e.g. basement/ stilt/ etc.)
    - Under-utilized plots/ building premises/ vacant plots
  - d. Document and prepare a base map of the parking management area to mark all existing parking spaces, hawkers/vendors, amenities like parks, public toilets, public utilities like transformers, street infrastructure, street furniture, etc.
  - e. Document percentage of neighbourhood green area within the PMAP boundary

- f. Map out the residential, commercial and office buildings in the PMAP area to indicate the usage of parking spaces in the buildings. This can help to earmark parking lots that can be shared between different sharing of parking spaces.
- g. **Survey for assessing the nature of parking demand to identify** overall parking accumulation, turnover of parking spaces, average duration of parking in various on-street and off-street parking lots in the PMAP area. This is needed to devise various strategies for reorganising parking.
  - Off-street parking survey should include in-out flow of vehicles at different time intervals; occupancy count in the selected parking lots. Assess number of vehicles that enter the parking lot to assess turn over, duration and occupancy by modes of vehicles.
  - On-street parking should include in-out flow of vehicles at different time intervals; occupancy count in the selected parking lots. Assess number of vehicles that enter the parking lot to assess turn over, duration and occupancy by modes of vehicles. Apply license plate method of survey to assess inflow and outflow of vehicles in time intervals.

### 2.2.3. Residential areas

Steps to follow for preparing PMAP for Residential Areas:

- (i) **Vehicular & Pedestrian Circulation Plan:**
  - a. Identify the desirable road network (as per MPD-norms) required for proper traffic dispersal and make them un-gated and open 24x7 to all vehicles including emergency vehicles. *This is especially critical in case multi-level/ stack parking is being considered;*
  - b. **Create plan for road geometry and footpath improvements, universal accessibility and provision of street amenities** as per MPD-2021 (Annexure-12(I)), on all roads within PMAP area by reclaiming space from on-street illegal parking, wherever required;
  - c. **Demarcate the emergency vehicle route** on all public roads within the neighbourhood; which would be physically demarcated in thermoplastic paint;
- (iii) **No parks for parking** - No parks to be converted to parking (As per MPD 2021 Introduction (f) Pg VIII)
- (iv) **Demarcate On-Street Uses including parking facilities, as required:**
  - a. After provision of adequate footpaths as per codes, prioritize facilities as per Annexure-I; Demarcate remaining space for on-street parking;
  - b. In case metro station exists, then MMI guidelines take precedence (Annexure-III);
- (v) **Demarcate Off-Street Uses including Parking Facilities, as required:**

- a. In case green areas are deficient, first provide green areas by reclaiming space from off-street parking lots; Ensure neighbourhood green areas to be at least **20%** of the overall area (not including zonal parks);
  - b. If more off-street parking is required (refer Annexure-V), then within the PMAP boundary; locate any uses which are empty/ **under-utilized at night** time and negotiate with relevant stakeholders to make it available as a paid parking facility for residents during night/ weekends (refer thumb-rules for shared parking at Annexure-IV).
  - c. Identify under-utilized lands such as open parking lots, community halls, under-developed government offices or their parking lots, new development plots, etc. which could accommodate stack/multi-level parking facilities, if required;
  - d. **New standalone multi-level parking projects are to be avoided**, since land is too valuable and required for more important uses like housing, parks, facilities, etc. Instead, *any new/ redevelopment project in the area should provide at least 50% of its equivalent car space (ECS) requirement as per MPD as an unbundled, shared parking facility (refer Section 2.2.5);*
  - e. Government may provide Viability Gap Funding (VGF) for half the ECS requirement as per MPD 2021 norms for planned old housing schemes. In private colonies, people may need to generate their own funds even if government facilitates provision of land.
- (vi) **After notification of PMAP with public consultations and feedback –**  
Demarcate new parking sites/ spaces on ground as per approved PMAP, install signage, pricing information and monitoring infrastructure;

#### 2.2.4. Commercial areas

Steps to follow for preparing PMAP for Commercial Areas:

- (i) **Vehicular & Pedestrian Circulation Plan:**
  - d. Identify the desirable road network (as per MPD-norms) required for proper traffic dispersal and make them un-gated and open 24x7 to all vehicles including emergency vehicles. *This is especially critical in case multi-level/ stack parking is being considered;*
  - e. **Create plan for road geometry and footpath improvements, universal accessibility and provision of street amenities** as per MPD-2021 (Annexure-12(I)), on all roads within PMAP area by reclaiming space from on-street illegal parking, wherever required;
- (vii) **No parks for parking** - No parks to be converted to parking (As per MPD 2021 Introduction (f) Pg VIII)
- (viii) **Demarcate On-Street Uses including parking facilities, as required:**
  - c. After provision of adequate footpaths as per codes, prioritize facilities as per Annexure-I; Demarcate remaining space for on-street parking;

- d. In case metro station exists, then MMI guidelines take precedence (Annexure-III);
- (ix) **Demarcate Off-Street Uses including Parking Facilities, as required:**
  - f. In case green areas are deficient, first provide green areas by reclaiming space from off-street parking lots; Ensure neighbourhood green areas to be at least **10%** of the overall area (not including zonal parks);
  - g. Identify under-utilized lands such as open parking lots, community halls, under-developed government offices or their parking lots, new development plots, etc. which could accommodate stack/multi-level parking facilities, if required;
  - h. **New standalone multi-level parking projects are to be avoided**, since land is too valuable and required for more important uses like housing, parks, facilities, etc. Instead, *any new/ redevelopment project in the area should provide at least 50% of its equivalent car space (ECS) requirement as per MPD as an unbundled, shared parking facility*;
- (x) **After notification of PMAP with public consultations and feedback –** Demarcate new parking sites/ spaces on ground as per approved PMAP, install signage, pricing information and monitoring infrastructure;

### 2.2.5. Criteria for provision of new Shared Parking facilities:

Land being a finite resource, there are a lot of pressing requirements to be met in the city such as provision of affordable housing, neighbourhood parks, community facilities, convenient shopping, bus terminals/depots, etc. and therefore valuable public land cannot be provided for only parking of private vehicles in standalone structures.

In order to ensure most efficient utilization of land, it is recommended that in all new projects (e.g. commercial, institutional, housing, etc.), *at least 50% to 100% of the equivalent car space (ECS) as per MPD requirement, be provided as an **unbundled, shared parking facility**.*

‘Unbundled’ means that the parking space shall be sold/ auctioned/ disposed separately during disposal of the property and not as a package deal where parking is a “hidden cost” to the buyer who may or may not want to own a car. Therefore buyers should be given the option to purchase an ECS-space **separately** during the bidding/ application process for an apartment or commercial space. This would reveal the true cost of parking to end users and unsold parking spaces can be sold to DMCs to be used as part of the Public Parking pool of that PMAP area. Once sold to DMC, the shared parking facility would be available on short term rental leases only as per DMC public parking rules, but preference could be given to local residents when parking spaces become available for lease.

In terms of planning/ design, such a shared parking facility could preferably be a detached parking structure (multi-level or stacked) within the same plot (i.e. residential/ commercial/ institutional/ etc.) having a separate entry/exit for residents of the development, so that their security is not compromised. Preferably such structures should have direct access from the

main road and entry/exits at separate points to avoid congestion at a single point. Ground floors of such parking structures should be lined with active uses to improve street surveillance and not have boundary walls creating visual barriers and unsafe conditions. Roofs could also be used as green-roofs, public parks, solar roofs, etc. Design guidelines as per Annexure VI would be applicable.

### 2.3. Contractual Considerations for Parking Operator (Contractor):

The parking contractual agreement:

- must ensure that the revenue sharing model is dynamic and flexible, allowing for flexibility in charging and varied usage and rates of the parking spaces;
- should specify the investment that Contractor will have to make for upgradation of the PMAP area including metering, ITS application for commuter information, signages etc
- ensure that revenue sharing dynamic and flexible based on market local demand - and is linked to local area improvement esp. road geometry and walkability.
- Set management rules; Signages and pricing meters; IT systems for information and enforcement; penalty for illegal parking; Parking monitoring; Parking data collection and analysis for policy feed back; Street design and management of queues; Street reconstruction services; Carry out proper surveys to know the expected revenue etc
- Upgrade technology level of parking lots to assess parking demand;
- Reduce parking violation with parking meters
- Allow mobile payment and manage differential rates
- Inform users about parking availability.
- Use of automated boom barriers; RFID tags for motor vehicles; Electronic Guidance System for motorists; Vacancy display boards; Online reservation of parking at Central Business Districts/ High Priority areas and so on.
- Set up charging facilities for electric vehicles

### 2.4. Monitoring, Management and Enforcement of PMAPs:

It is well accepted that the current system, based on few cranes for towing away illegally parked vehicles and insignificant penalty is not working as a deterrent. Enforcement, with a combination of design, technology and manual means, is the key to the success of any Parking Strategy. The system needs the following changes:

- a. **Parking space markings, numbering and signage-plan** to be approved and implemented as part of a comprehensive PMAP.
- b. Subsequently, **Parking spaces must be marked physically on ground** in public areas as well as through display of signage, for the benefit of both parkers and enforcers. The approved PBD Plan of the area should also be displayed near major entry/exit locations and at various visible locations within entire PBD for transparency and public information.
- c. **Penalty for illegal/wrong parking to be increased enough to be a deterrent:** The Municipal Act of Delhi shall be used to enforce illegal parking on roads, footpaths and cycle

tracks in Delhi, as they are an impediment to the movement and safety of all road users and also emergency vehicles.

- d. **Use handheld Electronic ticketing/fining system for better enforcement and transparency.** Provision of parking meters is desirable.
- e. **Monitoring and Public Information:** Parking lots, garages and on-street lots may display total and real-time available parking spaces. CCTV cameras may be installed to make parking lots safe for women/ all users and monitoring. Parking help-booths to have monitoring personnel 24-hours.
- f. PMAPs have to be developed and monitored by a **single agency** for easier implementation, enforcement and greater accountability.
- g. **Improve the vehicle information and ownership database.** It has been seen that only 20 per cent notices for penalties issued reach the correct vehicle owners. Therefore vehicle ownership database must be continually updated by technological and administrative means.

### 3. Notification of more parking sites as per approved PMAP

The number of authorized private parking lots in Delhi, both on-street and off-street are grossly inadequate (possibly one-tenth) of the actual requirement in the city. This leads to unauthorized on-street parking on almost all roads of the city. It is therefore advisable for local bodies to notify more authorized paid parking locations throughout the city within various neighborhoods and roads, based on legitimate local demand e.g. near markets, hospitals, major public buildings/offices, etc. identify and notify streets for overnight parking of commercial/transport vehicles. Such demarcated parking sites should then be suitably demarcated, notified and priced, and the rest of the public space areas declared illegal or 'no-parking' zones. Implementation should be based on an approved comprehensive area level PMAP plans only.

### 4. Benefits to End Users \*\*\*

The end users of such planned Parking Benefit Districts (PMAP areas) benefit in the following ways:

- (i) End users of paid parking facilities shall have the assurance of safety for their vehicles; They have assured parking spaces in the neighbourhood.
- (ii) Fees levied for parking would be used for walkability improvements in the area including universal accessibility, street lighting, maintenance, etc.;
- (iii) Advanced public information systems regarding mode choices and parking supply availability before visiting any area;
- (iv) Benefit to local districts in the form of overall improvement in quality of place and reduction of vehicular chaos.
- (v) Fees will also prevent invasion and encroachment from neighbouring colonies
- (vi) Fees will also allow equitable sharing of local parking spaces.
- (vii) People by deciding not buy multiple cars can save on permit fee.

## 5. General Rules

1. Under any circumstance, no vehicle, either parked or moving – should block the access route of emergency vehicles (ambulance/ fire-trucks, etc.) to any building in any area of the city where proper road access exists.
2. Any area or spot that is not notified and physically demarcated as a parking site/spot shall automatically be considered a 'no-parking zone' and relevant penalties shall be applicable.
3. Preferably, provide only premium short-term parking\* on-street, for visitors and shoppers
4. Demarcate all on-street spaces on plan also to be physically demarcated on ground during implementation
5. Only single row per side 'Parallel Parking' is permitted on roads
6. Modal distribution of ECS on-ground should be as per MPD-2021 (Annexure-III) and site conditions.
7. Base Price Rate (BPR) in all cases should be higher than the base IPT fare for short trips ( $\leq 3$  km); higher pricing may vary from place to place and the same shall be fixed by the Apex committee based on zone/ area/ type of demand, etc.
8. 50% of the ECS of any scheme/ building/ use premise may be used for paid public parking. These may be used as shared parking facilities between different uses within the PMAP having different peak hours of activity (**refer Annexure-IV**). For example, an office facility that is empty at night may be used by cinemas, restaurants or neighbouring residences in the evening as a paid facility. This allows for efficient utilization of scarce land, resources and finances. Such facilities must be universally accessible.
9. Penalty for illegal/wrong parking must be enough to be a deterrent, in which case enforcement could be through surprise checks.
10. Junk vehicles should be identified and impounded. Proper disposal should be planned.

## 6. Parking pricing strategy (This section will be further refined based on the detailed guidelines being developed by the parking pricing sub group)

### Principles to guide parking pricing in PMAP

- **Eliminate free parking and introduce effective parking charges. Personal vehicles must be parked on a fully-paid space, based on 'user pay' principle** as per the National Urban Transport Policy.
- **Parking charges should be optimal and not be so high as to reduce occupancy drastically or too low that it induces more demand.** The optimal pricing should ensure

that at least 85 per cent of the available parking spaces are occupied during peak time. About 15% of parking spaces can be vacant and available at any time to encourage short term parkers.

- Adopt method for fixing parking base price in commercial and residential areas
- **Introduce variable parking rates to influence parking demand:** Parking rates areas should be set:
  - According to peak and non-peak hour
  - Duration of stay (higher hourly charges for longer duration)
  - Commercial importance of areas and level of connectivity
  - Weekdays when demand is high, and weekends when low. Higher turnover of parkers increases volume of business and leads to efficient use of available parking areas.
  - Maintain differential between on-street and off-street parking rates to incentivise use of off-street facilities.
  - Charge convenient parking spaces higher than the inconvenient places to reduce crowding and also to influence commuting choices.
  - Free parking should be allowed only to cycles and cycle rickshaws and battery operated vehicles and public transport vehicles.
- Do not allow annual or monthly lump sum payment for parking in commercial areas. Annual passes allow unlimited use and do not reduce demand. Commuter behaviour will remain unresponsive to pricing
- Parking rates (even if differential) should be applied to the entire PMAP area and not to a few streets.
- Penalise illegal parking heavily enough to be a long term deterrent;
- Prices need to be adjusted regularly otherwise parking management benefits will erode gradually. Otherwise even modest rises become wildly unpopular and can have a high political cost. If revenue is key objective it leads to public hostility to price rises.
- Based on demand for Short-term parking; create Pricing strategy varying by location and time of day/ week; and as per thumb rules given in Annexure-IV
- To illustrate the point it may be noted that:
  - In commercial areas based on the methods to be adopted by the urban local bodies an hourly base price may be fixed and made variable according to the demand management principles of parking pricing as outlined above.
  - Residential areas: Residential parking permits may be issued during the first phase: As the legal parking area in public spaces in neighbourhoods will be identified and demarcated along with the local residents, the number of residential parking permits to be issued in the PMAP area will be based on the demarcated legal spaces in the area.
  - In the second phase pricing of residential permits may be introduced based on the timeline to be decided: Illustratively, start with an auction to set the price per month for the permits in each area (possibly open only to people who already park in the streets and therefore have demonstrated need) and have everyone pay the minimum successful bid price. [OR just set the initial prices by some other method if an auction is too difficult. This is needed to bring demand and

supply into balance. After this, have people apply for permits. Check every year/ 6 months if there is a waiting list for the limited number of permits. If there is no waiting list then the price can stay unchanged or rise in line with inflation. If there is a waiting list, then increase the permit price based on a method to be adopted and an acceptable rate can be worked out to accommodate new permits.

- If night time parking demand is high and if both private parking and public parking are limited, then prices may be adjusted accordingly. This will trigger several decisions including leasing off-street parking nearby or moving house to an area with easier/cheaper parking. Higher prices will also prompt some real-estate actors to open more off-street parking. Sometimes there is existing private parking that is empty at night. High prices may also prompt entrepreneurs to actually build parking or offer to supply housing societies with supply enhancements such as stacked parking devices. A few may even get rid of extra vehicles.
- The longer term objective of residential parking permit is to gradually reduce the demand for permits to match the limited supply (of overnight on-street and sometimes also of public off-street parking).
- Based on demand for Short-term parking; create Pricing strategy varying by location and time of day/ week; and as per thumb rules given in Annexure-IV
- Implement four times increase in parking charges as per the requirement of pollution emergency measures under the Graded Response Action Plan

## Annexure - I:

### Order of prioritization in planning for public space and location of Parking facilities

- a. the On-street space need to be utilised for the general convenience of users in the following order of priority:
  - (i) Movement space for pedestrians and cyclists and the differently abled
  - (ii) Movement and parking space for emergency vehicles
  - (iii) Multi-modal integration including bus-stops
  - (iv) IPT/ para-transit pick-up and drop-off especially near intersections, bus stops and high-footfall areas
  - (v) Hawking/ vending zones
  - (vi) Cycle parking
  - (vii) Private vehicle pick-up and drop-off
  - (viii) Electric vehicles
  - (ix) Priced private vehicle parking (short term)
  - (x) Overnight parking (esp. for buses, commercial vehicles, etc. on Arterial Roads)
  - (xi) Wherever required, on-street parking to be removed adequately to provide network connectivity as per MPD-norms – for efficient traffic dispersal (esp. from MLCPs).
  
- b. Off-street at-grade space need to be utilised for the general convenience of users in the following order of priority:
  - (i) Usable Green Open Space for sports/ recreation and local infiltration (no parks to be converted to parking);
  - (ii) Bus/ service vehicles/ commercial vehicles and IPT parking/ drop-off
  - (iii) Hawking vending zones near important nodes/ markets/ intersections, etc with proper shaded seating, etc.
  - (iv) Priced private vehicle parking
  
- c. Multi-level parking/ stack parking facilities for private vehicles should be located so as to:
  - (i) have a direct access/exit from/to at least two different major roads:
  - (ii) should be provided within existing open parking lots; within under-utilized buildings premises/ govt. office premises/ community plots/ new development projects/ etc.and not as standalone plots, since land is too valuable and required for more important uses like housing, parks, facilities, etc.
  - (iii) be priced lower than on-street parking facilities
  - (iv) As per MPD 2021 (Chapter 12 Transportation; section 12.14.3.6) multilevel parking for public buses by implemented.

**Annexure - II: Guidelines and thumb-rules for allocation of parking spaces**

	LOCATIO N	TO VISUALLY RECORD:	RULES TO MEASURE ECS	What to do:
	<p><b>On-street</b></p>	<ul style="list-style-type: none"> <li>Does Metro station exist?</li> </ul>		<ul style="list-style-type: none"> <li>If Metro station exists, then <b>Multi-modal integration as per MPD takes precedence</b> (Table 1 below);</li> </ul>
<ul style="list-style-type: none"> <li>Mode – auto, rickshaw/ taxi-dropoff locations?</li> <li>Hawker/vendor locations?</li> </ul>		<ul style="list-style-type: none"> <li>Count number during peak and non peak hours</li> </ul>	<ul style="list-style-type: none"> <li><b>IPT and NMT parking and vending zones should be located near road intersections and near bus-stops;</b></li> </ul>	
<p>Cars/ two-wheelers:</p> <ul style="list-style-type: none"> <li>Style - Parallel/Diagonal/Perpendicular?</li> <li>Row – single/double?</li> <li>Side of street – one/both?</li> </ul>		<ul style="list-style-type: none"> <li>Total no. of on-street parking spaces = <math>\frac{\text{Road length (m)}}{4(m)} \times \text{no. of pkg. lanes}</math></li> </ul>	<ul style="list-style-type: none"> <li><b>Reclaim on-street parking spaces for other functions based on priority list</b></li> <li><b>Preferably, only provide only premium short-term parking* on-street</b>, for visitors and shoppers only;</li> <li>Maximum no. of proposed on-street parking ECS** = <math>\frac{\text{Road length (m)}}{5(m) \times 2}</math></li> </ul> <p>(**considering 50% of total road length used for parallel parking on two-sides.)</p> <ul style="list-style-type: none"> <li>Only single row Parallel Parking permitted on roads;</li> <li>Modal distribution of ECS on-ground should be as per MPD-2021 and site</li> </ul>	

				conditions. *Short-term Parking < 3 hours
<b>Off-street</b>	<ul style="list-style-type: none"> <li>• Parking lot size</li> <li>• Organized with markings or random?</li> <li>• Percentage of Usable public Green space within the area?</li> </ul>	<ul style="list-style-type: none"> <li>• No. of ECS = <math>Lot\ area / 16</math></li> <li>• Establish long-term and short-term demand (through primary surveys or interviews of local parking operators)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Convert off-street open parking areas into either Green Areas or MLCP</b></li> </ul> <p>(Note: Off-street parking lots should not be retained/ provided)</p>	
<b>Multi-level Car parking (MLCP)</b>	Existing? Then what is the lot area?	No. of ECS = $Lot\ area / 30$	Retain with appropriate pricing as per rules.	
<b>Stack</b>	Parking lot area	No. of ECS = $Lot\ area / 16$	Retain with appropriate pricing as per rules.	
<b>Under buildings (basement / stilt)</b>	<p>Building footprint area under parking</p> <p>No. of floors under parking</p>	No. of ECS = $Parking\ floor\ area / 16$	<ul style="list-style-type: none"> <li>• Retain parking under buildings and price as per rules, if applicable.</li> <li>• If occupancy varies during the day/night hours; then convert to Shared public parking facility</li> <li>• Price as per rules</li> </ul>	
<b>Under-utilized lands/ under-utilized building premises/ off-street open parking/</b>			<ul style="list-style-type: none"> <li>• <b>Create MLCPs for long-term parking*</b> within existing open parking lots; within under-utilized buildings premises/ govt. office premises/ community plots/ new development projects/ etc.</li> <li>• Price as per rules</li> </ul> <p>***Long term parking (<math>\geq 3</math> hours)</p>	

### Annexure - III: Norms and Standards as per MPD-2021

**Table 1: Master Plan of Delhi-2021; Table 12.8: Guidelines for multimodal integration at metro stations**

Approx. walking distance from exits	Facility/ amenity and preferred location:
Within 100 m	Bus stops; vendor zones; convenience shopping; cycle-rental station, high occupancy feeder stop/ stand, public toilets; pedestrian-only plazas.
Beyond 100 m	Private car/ taxi "drop-off" location only; validated car parking facility for metro users (park & ride) may be provided.
Within 500m	Cycle-rickshaw stand; cycle-parking stand; IPT/ auto-rickshaw stand, improved lighting, proper signage, information for modal interchange and way-finding; interchange between any two mass rapid transit modes (Railway, Metro, RRTS, etc.)

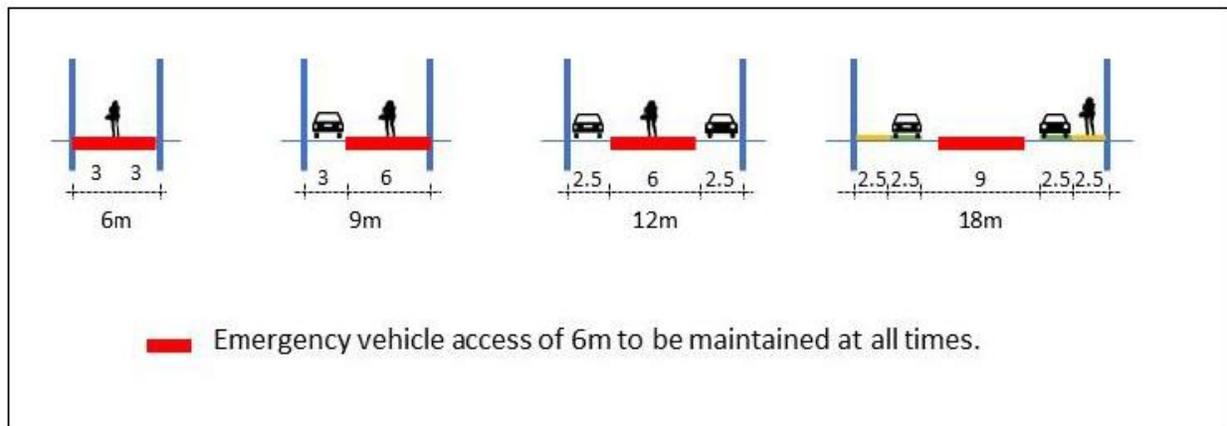
**Table 2: Parking Standards (as per MPD-2021 and other Codes)**

Mode	Approx. Parking space distribution by mode per 1 ECS/100 sq.m. of Built Up Area for all projects	Distribution of Parking spaces by Mode
Cars/ Taxis	2.5 x 5	0.6
2 Wheelers	1.5 x 2.5	0.25
Cycles	0.5 x 2	0.05
Auto Rickshaws	2.5 x 2.5	
Cycle Rickshaws	1.5 x 2.5	0.05
Vans/ RTVs / any Metro Feeder services, etc.	12 x 3	0.05

**Table 3: (MPD-2021, Table 17.3) Space Standards for Car Parking**

S. No.	Type of Parking	Area in sqm. per ECS
1	Open	23
2	Ground floor covered	28
3	Basement	32
4	Multi level with ramps	30
5	Automated multilevel with lifts	16

**Figure 1: Emergency vehicle access on various types of neighbourhood roads CHECK cross sections 3 and 4**



### Annexure - IV: PRICING & SHARED PARKING THUMB-RULES

After the available on-street parking (ECS available) is demarcated, the following pricing strategy is to be followed:

**Table 4: Pricing Strategy for on-street parking**

	<b>Demand Comparison:</b>	<b>Pricing Strategy:</b>
	On-street parking availability < Short-term parking demand	Pricing to be low but not less than BPR and MLCP (if existing)
	On-street parking availability > Short-term parking demand	Pricing to be exponentially increasing, as per multipliers and rates decided by Apex Committee
	Off-street Parking price	To be lower than on-street price
	Off-street MLCP/ Stack Parking Facility	To be lowest but not less than BPR

**Table 5: Shared Parking Possibilities:**

<b>Use</b>	<b>Day-time Occupancy (approx.)</b>	<b>Night-time Occupancy (approx.)</b>
Residential	<b>30%</b>	<b>100%</b>
Offices	100%	10%
Schools	100%	<b>1%</b>
Cinema	80%	80%
Local markets	70%	100%
City level Markets	100%	60%
Institutions	100%	<b>2%</b>
Govt. offices/ buildings	100%	<b>2%</b>

**Notes:**

- Day time parking is a more grave issue and supply can never match demand if pricing strategies are not used as a deterrent to shift people to IPT/ para-transit and public transport modes.
- Night time parking demand can be addressed by opening up and sharing of under-utilized/empty parking facilities within Institutional and govt. buildings within the PMAP area.

**Table 6: Peak parking demand for different land use type and opportunity for sharing:**

<b>WEEKDAY PEAKS</b>	<b>EVENING PEAKS</b>	<b>WEEK END PEAKS</b>
Banks Schools Factories Medical clinics Offices Professional services	Auditoriums Bars and dance halls Meeting halls Restaurants Theatres	Religious institutions Parks Shops and malls

**Annexure - V: STRATEGY FOR PROVISION OF MULTI LEVEL/ STACK PARKING FACILITIES**

Identify 500m radius/area around the place where demand is perceived, and apply the criteria as per the following table:

**Table 7: Criteria for provision of multi-level/ stack parking facilities:**

	<b>Character of area within 500m radius of the proposed multilevel/ stack parking site</b>	<b>Strategy</b>
1	<b>All plots are planned</b> as per MPD-2021, yet spillover parking on roads is happening (e.g. most areas in Dwarka, Rohini, etc.)	<ul style="list-style-type: none"> <li>• In new areas, No additional off-street public parking should be provided as parking is provided within use premises as per MPD-2021;</li> <li>• Spillover parking on public streets should be strictly regulated by proper demarcation on ground and enforcement as per PMAP guidelines;</li> <li>• In case of planned old neighbourhoods or commercial centres &gt;25 years old; MLCP/stack parking may be provided in under-utilized plots as multi-use projects with shared unbundled public parking. <b>No change of landuse is required.</b> For example, a new housing or commercial project could provide its ECS as a shared parking facility which can be shared during off-peak hours;</li> <li>• Provision of adequate green areas as per PMAP guidelines must be ensured;</li> </ul>
2	<b>Un-authorized/unplanned colonies</b> exist, which are creating parking demand and spilling over on public roads (e.g. most areas in East Delhi)	<ul style="list-style-type: none"> <li>• No empty plot should be converted to parking to cater to needs of un-authorized development;</li> <li>• Spillover parking on public streets should be strictly regulated by proper demarcation on ground and enforcement as per PMAP guidelines;</li> <li>• If possible, any new/ redevelopment project in the area should provide at least 50% of its equivalent car space (ECS) requirement as per MPD as an 'unbundled' shared parking facility with appropriate pricing. (<b>for e.g.</b> empty office/ institutional parking lots can be used by residents returning at night, instead of parking on public streets and blocking emergency vehicle access, etc.)</li> </ul>
3	<b>Notified mixed-landuse development</b> exists as per MPD, for which conversion charges have already been levied by local body (e.g. Lajpat Nagar, Karol Bagh, etc.)	<ul style="list-style-type: none"> <li>• Under-utilized/ vacant plots can be (re)developed with shared public parking facilities, but only as part of an approved PMAP plan so that parking supply does not double up leading to even more congestion;</li> <li>• Illegal on-street parking should be reclaimed for footpaths, universal-access facilities, public toilets, cycle parking/sharing facilities, vendors and amenities as well as demarcated on-street (short-</li> </ul>

	<p>term) parking where required.</p> <ul style="list-style-type: none"> <li>• A single agency must monitor and manage the off-street and on-street parking facilities for the entire PMAP.</li> </ul>
--	---

**Annexure - VI: DESIGN GUIDELINES FOR PARKING FACILITIES**

**Parking Design, Access and Street interface regulations**

**1 For all on-site (off-street) parking facilities:**

- a) Locate parking behind buildings, not directly facing the footpath of the main R/W. Access to parking will be from a street lower in the hierarchy amongst the streets demarcating the block / plot.
- b) Parking access should be located in a mid-block location and with minimum number of access driveways, to minimise kerb cuts and maintain continuity of footpath. Conflict with bus-stops, NMT and pedestrians must be minimized.
- c) iv.1. Parking and loading access shall be shared where feasible.
- d) iv.2. Raise all driveways/ vehicular entries to the finished footpath level (using table tops or raised driveways), iv.3. to maintain continuity and level of the footpaths/ cycle tracks. Plan and locate access / entries to parking iv.4. facilities so that curb cuts are minimized and footpath continuity is maintained.
- e) iv.5. i.6. Only the minimum driveway width of 6 M required for access to parking shall be permitted. iv.6. i.7. Illuminate all parking areas and accessing pedestrian walkways with minimum 20 lux.
- f) iv.7. i.8. Drop-off zones shall be located within parking facilities or alongside footpaths such that conflict with iv.8. pedestrians is minimized and continuity of footpaths is maintained.

**2 At-grade parking:**

- i.1. No boundary wall shall be constructed around parking lots. If required, they may be fenced or cordoned off with low growing landscape, so that visual connection between parking lot and adjacent footpath is maintained.
- ii.1. Parking lots must also function as stormwater management systems, as per UTTIPEC Guidelines. Only permeable materials to be used for surface parking.

**3 Structured/ Multilevel parking:**

- iii.1. Ground floor of all parking structures must be lined with active uses (as defined in para 19.5B). Refer Fig 3 below.
- iii.2. To minimize impact of parking structures on residential uses, garage floors and ramps should use textured surfaces to minimize tire squeal, and exhaust vents should not be located along sides closest to residential uses.

**Figure 2: Structured parking with street level active uses**

