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# **ISSUES AND CHALLENGES OF PARKING IN INDIAN METROPOLISES**

*A city can be friendly to people or it can be friendly to cars, but it can't be both.*

*- Enrique Peñalosa*

## ***INTRODUCTION***

Economic and population growth have led to rapid urbanization and changes in the metropolitan infrastructures. Rapid motorisation and inadequate space to support it are one of the most important factors influencing the mobility and accessibility in a city. As a result of the development induced changes, demand for facilities like parking is increasing. Tremendous pressure on parking spaces have led to serious concerns like traffic congestion, accidents, disproportionate demand and supply ratio, environmental hazards etc. Excessive consumption of the private vehicles negatively impacts the environment and the public at large but still private vehicles continue to be a preferred and convenient mode of communication. The present assignment focuses on the common problems and challenges faced by the parking sector in a country like India.

**The chief research question which the term paper seeks to answer are:**

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- What are the common parking problems faced by highly populated Indian cities like Mumbai, Kolkata and Delhi in India ?
  - What are the proposed solutions to the identified problems of parking in these cities? (The term paper focuses mainly on the publications of Donald Shoup in order to deal with the second research question;)
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India and other countries across the globe with poor parking solutions continuously struggle with chaotic and troublesome situations like parking at intersections, parking on the footpaths due to saturated parking spaces etc. Certain areas like the parking of two wheelers, parking space acting as a site for criminal activities due to improper surveillance stand ignored. Problems associated with parking affect roadways near ATM, banks, snack stalls, newspaper endorse etc. have become centres of chaotic and unregulated parking. Specialized institutions like hospitals, school and college campuses, temples, church (places of worship etc.) are places which attract a large number of people, sufficient parking spaces should be available in these areas as it leads to traffic congestion, arguments and quarrels and wastage of the time during the major working hours of the day (Guidelines Of Traffic Reform; 2013). The disturbances created also hamper the systematic functioning of the institutions.



Parking Spaces outside certain areas like  
ATM, Banks are ignored

The issues and challenges revolving around the problem of parking are as follows:

### **PROBLEM OF SATURATED PARKING SPACES**

One of the problems which dominates different cities like Delhi, Kolkata and Mumbai at large is the saturation of parking spaces. Existing Vehicles which are numerically on a rise continue to outnumber the existing parking spaces, clogs the roads and hamper the smooth commutation. According to the Centre for Environment And Science, parking takes up approximately 10% of the city space in Delhi and instances have been recorded when finding parking spaces gets impossible. Presently Delhi has around 82 lakh registered cars, on top of which some unregistered and some vehicles from other cities occupy the streets of Delhi. The urban sprawl in Delhi has encouraged this vicious cycle of private vehicle consumption. Incidence of violence like assault and murder

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have also been recorded in Delhi over the occupancy of parking spaces (July 2014, Hindustan Times). Problems pertaining to parking spaces also exist in Kolkata. The capacity in terms of car holdings of the parking spaces is often ignored and cars are parked in excess of the feasible quantity. Cars are often seen parked parallel to each other in rows. Spaces get crunched which deforms the shape of the cars. Incidences of overcharging for parking facility have also been reported in places like BBD Bag, Maniktala and New Market (Mukherjee' 2015) The contractors, officials and corporators coordinate in such activities and ensure that the nexus carries on. The solution provided by the respective administrative structures are increase in the number of parking spaces. Delhi has proposed the idea of having parking lots below the parks. Colony parks and vacant plots are used as potential parking spaces, moreover the South Delhi municipal Corporation plans to implement the idea of two multilevel underground facility and five additional parking lots by 2017. The Municipal Corporation Of Greater Mumbai has proposed the idea of constructing parking spaces in 21 locations across the city which will have the capacity of generating space for 1 lakh cars. Thus the cities are attracted more to the idea of increasing the existing number of spaces irrespective of the limited land space and resources.

This idea of making room for more private vehicles is discouraged by a distinguished academician called Donald Shoup. He argues that increasing the existing space is not the best possible option for the cities but a better alternative would be **putting a cap on the parking requirement**. Shoup suggests in order to have minimal parking space, cities should exercise the idea of putting a maximum parking cap on the parking requirement. Shoup has also given his defence on why he suggests maximum parking limit instead of minimum. Minimum parking, he argues will ensure ample free parking parking almost everywhere which will eventually make cars the default mode of travel (Shoup; 2015).

Portland, Oregon stands as an example of how an overall cap of 40,000 parking spaces downtown decreased the consumption of private vehicles and increased public transport usage from 20- 25 per cent in the 1970s to 48 per cent in mid 1990s. In order to have an efficient parking system, Japan ensures that before the registration of private vehicles, the citizen ensures the availability of parking space.

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Saturated Parking Spaces is a prolonging problem in India and parking of two wheelers is often not given sufficient amount of attention.

## **THE PROBLEM OF UNREGULATED TARIFF STRUCTURE AND THE PRICE IS NOT PROPORTIONAL TO DEMAND**

Unregulated tariff structure also leads to the scarcity of parking spaces. Parking in the mentioned Indian cities come either for free or are charged very low. Cities across India charge static rates which have not been regulated since many years. In an article in Hindustan Times by Neha Bhayana, it was mentioned that the city of Mumbai continues to charge the same rate it used to 20 years ago and it has one of the lowest tariffs in the world. Marginal difference in tariff is noticed in places like Nariman Point, Sion, Dharavi etc. in the city of Mumbai. The parking price in India stops increasing after a certain period of time, thus the longer one stays in a parking space, the lesser he/she has to pay. In Sarojini Nagar, Delhi the Parking Price is rupees 20 per hour. However they have a standard fee of Rs. 100 for 24 hours which makes parking all the more cheaper. Parking space is a scarce commodity today and it should come with a price. Low parking price encourages more private vehicles on the road, increased cases of solo driving are seen which does not lead to the optimum utilization of resources and contributes to the air and noise pollution. One of the most feasible way to manage car parking is charging the most appropriate price for it. Cities according to Donald Shoup should price parking by demand and optimize the occupancy. He argues that it is very important to strike a proper price for the parking. If the price is too high and many curb spaces remain open, nearby stores lose customers, employees lose jobs, and governments lose tax revenue. If the price is too low and no curb spaces are open, it leads to traffic congestion and chaos (Shoup; 2005). Parking Prices may be implemented as a TDM strategy (to reduce vehicle), it may be used as a parking management strategy or as a means of generating revenue. **Parking Pricing** can thus be a very effective tool for the management of travel demand as a whole. It has been suggested by the

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Institute Of Transportation And Development Policy that parking should be priced according to zones and demand levels, the fee should be proportional to the vehicle size and duration of the parking, no discounts should be provided. In Bengaluru, variable parking price with higher rates during peak hours and lower prices during off-peak hours has been implemented in order to relieve the traffic. (Down To Earth Bengaluru, Jan 20)

### **PREFERENCE OF ON-STREET PARKING OVER OFF- STREET PARKING**

Another problem which has been prolonging since a very long time is the imbalance in the demand of on street and off off street parking and on street parking. The reason for the preference of on street parking over off street parking is severe potholes in the parking policies. It has been observed in metropolitans that on street parking continues to be cheaper than off street parking because of reasons like the cost involved in the construction of off street parking being higher. The reduction of the available lanes of a road to accommodate on-street parking is the primary factor that reduces road capacity parking. On-street parking manoeuvres can cause extensive delays, especially on heavily trafficked roads. It creates stop-start traffic flow behaviour for the lanes adjacent to the parking lane, thus affecting the capacity of the concerned road section. The price of on street parking continues to be lower than off street parking which prevents people to utilize the off street parking, thus there should a balance in their tariff so that the spaces of both the parking optimally utilized. Donald Shoup, while comparing the price of an on street parking and an off street parking like garage, agues that it is the price of the curb parking which is too low (Shoup; 2013)



The tariff of on street and off street parking is not balanced properly as a result of which the equilibrium of on street and off street parking is disturbed and on street parking continues to dominate the preference of the people.

In order to deal with the problem of space and high demand effectively, Donald Shoup also suggests that cities can maximize their parking assets by changing their parking policy. This can be possible

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by setting occupancies rather than aiming at higher revenues. A parking should avoid peak occupancies exceeding 80% and encourage minimum 40%. Parking exceeding 90% may result in parking shortages, long search time and entry/exit queues, it also causes the drivers to lose on time. Shoup talks about the Sfpark Garage policy which in addition to varying hourly prices based on demand, adjusts early bird parking time and adds off-peak discounts to lessen the peak congestion in and near garages at rush hour. As a result, most garages see far fewer cars entering at the morning rush and exiting during the evening rush. This non-price adjustment can reduce local traffic congestion. Changes in the parking price on an hourly basis affects the occupancy and the total revenue due to hourly and special parking rates. (Shoup; 2013)

Donald Shoup also suggests that if the city can successfully organize its parking in such a way that on street parking serves the purpose, developers will have little incentive to charge for the parking space they built. (Litman 2013, Jakle & Sculle, 2004) argue that the utilisation of on-street is considered to be a more efficient use of land as it limits the need for off-street parking and access points to properties adjacent to major arterial roads.

### **THE PROBLEM OF CRUISING**

Another problem encountered due to lack of parking spaces in Indian cities like Delhi, Mumbai and Kolkata is the problem of cruising. Often vehicles are seen cruising due to a shortage in the availability of parking spaces which leads to the formation of long queues and chaos in public places. Cruising for parking creates congestion, leads to the wastage of time and emissions in the environment. Cruising is the only option left for motorists when inadequate parking space is available after reaching the intended destination. Donald Shoup opines that there are situations where the drivers voluntarily choose to cruise when a free curb parking is not available and a chargeable off street parking is free but a driver wishes to cruise instead of paying. Thus by underpricing curb parking, cities create an economic incentive to cruise. Low costing parking are difficult to find and once occupied are not vacated easily, instances have been recorded where cars are parked in low charging parking spaces for days. If a balance in parking is struck than parking space will easily be available and incidence of cruising will reduce. Shoup concluded in his study that under priced curb parking leads to a shortage in the availability of curb parking, it leads to cruising and an average search time of 3.3 minutes is required to find a parking while in an appropriately priced curb parking, 1 of every 8 spaces is vacant, no cruising is required and parking

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is easily available. Shoup argues in order to economize one's lifestyle because of increased parking rates, one can drive at off peak hours when the curb parking is cheap, park where prices are low and walk further to the destination, park for shorter time, use car pools and split the travel cost or avail public transport (Shoup; 2007)

### **PROBLEM OF PARKING IN RESIDENTIAL APARTMENTS**

It is also important to bring in to notice that the residential apartments which are constructed nowadays are hardly thought of without a parking space. Such a situation exists because of a preconceived notion that residential plans without parking spaces will not be funded by banks, developers will not be interested in building them and the tenants would not be disinterested in such projects. It is argued that the construction of garages in parking play a very significant role in raising the household cost as they take huge amount of money for the construction which raises the overall budget of the housing project. Often the parking spaces in the buildings go unoccupied which results in the wastage of resources. In a study conducted in Portland, Oregon it was found that garage parking would lead to rent that was as much as \$500 higher per month in a typical low-rise apartment development. This would be the case irrespective of one's ownership of a car. In a study by Seth Goodman, it was noted that parking construction costs are the same within urban areas, regardless of whether the building is a luxury high-rise or modest apartments, thus the lower-income residents are disproportionately impacted by parking costs. The low-income residents are less likely to own cars, but they still have to subsidize other people's.

Off-street parking requirements or quotas have a large impact on the financial viability of new housing for both market and affordable housing development. Parking quotas act as density limits, inflate the average size and price of housing units. Today the consumption pattern in the cities have necessitated the existence of parking in the various building plans. Parking today stands as a minimum standard of living and its dismissal creates new challenges. It calls for the need of extra spaces suitable for parking and programs discouraging the use of private vehicles is preferred. Affordable housing is a distant idea as parking increases the property price and policies debunking parking may help in the achievement of the desired goal. Residentials also suffer from the problem of spillover parking due to commercial node visitors and ownership of excessive private vehicles.

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If **parking spillovers** continue to be a problem, a suggestion given by Donald Shoup is to manage on street parking in an efficient manner instead of increasing off street parking spaces. In order attract tenants to apartments without parking, the cities may include the system of inclusion of free transit passes in the lease for each unit by the landlords. This requirement according to Shoup will not burden development because providing a transit pass will cost lesser than building a parking space.'The combination of apartments without parking and with free transit passes will encourage residents to ride public transport, cycle, and walk.' (Shoup; 2015)

### **PROBLEM OF PARKING ON SPECIAL OCCASIONS**

In Indian cities, the traffic system goes for a test on special occasions. These days may be a festival, a cricket match, a famous celebrity visit to the city or simply an inter collegiate fest. On these days the crowd behave in a different manner and population debunk their quotidian routine. We see large number of people on streets which means increased vehicles. This creates a pressure on the parking spaces as the demand is never equivalent to supply. This leads to excess of cruising, chaos, quarrels and long queues which amounts to pollution and fuel wastage. In Kolkata during Durga Puja, almost the entire city is on the streets for Pandal Hopping, this is strenuous for the available parking spaces. Pandal are also erected by encroaching roads and spaces. The crowd and traffic on the street make situation so cumbersome that a distance requiring fifteen minutes is covered in approximately two hours. Different solutions like demand pricing may be thought of in order to deal with such scenario but Donald Shoup gives us the idea of **informal parking** which can help in give relief in the situation. Donald Shoup argues that the creation of informal on street and off street parking markets can create problems into solutions. Such markets are generated in Michigan where short, sharp and infrequent traffic demand is generated during a match in a stadium. Traffic congestion is relieved during peak entry and exit queues. Cities like Michigan have legalized such parking and backyards, lawns and driveways are used for the purpose of off street parking during such high demand days.

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Informal Parking can help in relieving the traffic by generating parking on the days of short, sharp and infrequent demand.

### **ENVIRONMENTAL PROBLEMS DUE TO PARKING**

The environmental cost of the excessive motorisation is borne by the whole population and not the drivers only. The parking lots accumulate a lot of pollutants like oil, grease, heavy metals and sediments which are not absorbed by the impervious surface and such contaminated substances get flushed into the water bodies during the rains. It leads to chemical contamination and deteriorates the water table. Parking lots also contribute to the urban heat island effect which raises the temperature of the nearby places by 2 to 3 degree Celsius. The Access Magazine published in its article titled 'Parking Infrastructure And The Environment' was studied that environmental degradation, excessive energy use and greenhouse gas emissions are severely contributed to by parking construction and maintenance activities. (Access Magazine; Access 39, Fall 11). It may be said that parking spaces act as a green signal for people with respect to the consumption of private vehicles and this motivates developers, government agencies and various businesses to provide parking. The causality of the issue is unclear and accurately allocating the blame of all the negative environmental effects of parking between drivers and other actors is not possible. Parking lots contribute to the production of Sulphur dioxide (SO<sub>2</sub>) which damages respiratory system and leads to the deposition of acids. PM<sub>10</sub> (Particulate Matter 10) emission which generate from hot-mix asphalt plants. Mixing and placing of asphalt is one of the predominant reason of cardiovascular harm among the people of the city. Everyone bears the blues in the form of adverse health impacts and reduced agricultural production.

One of the ways to benefit from excess of heat generated from the parking spaces is the use of **Solar panels**. These can be used as a canopy on the top of the parking lots. Cities with great solar

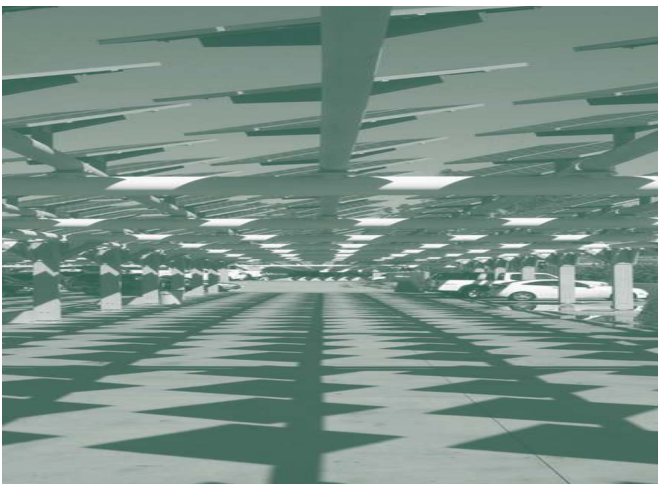
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potential can generate large amount of electricity Solar-powered parking lots can reduce the substantial increase in the energy demand during the peak hours but very few developers are motivated enough to install solar canopies over their parking lots. Buildings increase the demand for parking space specially during the peak hours and so rises their demand for electricity also rises, solar parking panels may help to reduce these demands. However, this is not a feasible idea in all cities and all land uses, sunny areas with large parking lots are the only suitable zones where this idea may be exercised. Solar energy is a very good idea for electric cars and it can also be used in charging car batteries. Shading parking lots reduce the consumption of air conditioning by motorists when they leave the parking lots on hot days which will result in better fuel efficiency and reduced tailpipe emissions. Reducing the demand for energy from the electric grid will also reduce power plant emissions that contribute to air pollution and climate change. Solar parking lots also help in setting up a decentralized back up of electricity which helps an economy during natural disasters or terrorist attacks.(Shoup; 2012)

Solar Panels can be used in parking lots in order to benefit from the excess heat generated, reduce emission and increase fuel efficiency.



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## CONCLUSION

Parking Space assigns no property rights, it is a very important resource for the efficient operation of lives of the people today and survival of the earliest is the mantra to emerge victorious in this competition. The case of parking is applicable to the central idea of economics which asserts that economy's finite resources are insufficient to satisfy all human wants and needs. The demand for parking spaces is rising sky high and it is very important to realize that our resources are limited and we cannot conveniently plan parking spaces as per the demand of an economy. Increase in the number of our available parking space should be the last idea worth considering. The problems discussed in the paper do not stand in isolation and are interwoven. Efforts taken to improve on will aid in diminishing the other. Working more in the already existing policies and increasing our technical soundness would be appreciable attempts. Countries like Australia, Ireland, Dubai etc. have invested both time and resources in order to reform parking strategies. They have come up with sound and efficient ideas like parking meters and mobile parking apps which makes the search easy for the people and if the ideas like setting price according to demand and occupancy control are implemented, technical affluence will work as a brownie point for the consumers and for the city as a whole.

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