

MANAGING PARKING ISSUES - AUTOMATED PARKING SOLUTIONS



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Introduction

India, the second most populated country in the world, houses more than 40 million vehicles, is the only country which saw a growing car sales even during the recession and recorded the highest sales volume during 2009 and 2010. India has a strong domestic market, and this growth is expected to sustain and increase over the next few years, given that India's car per capita ratio is currently among the lowest in the world's top 10 auto markets.

However, infrastructure available for vehicles – such as roads and parking spaces - has been an increasing challenge in most Indian cities.

Traffic Issues

Indian cities face a severe problem of congestion due to the runaway growth of personal vehicles. Traffic management in the many cities is marked by the introduction of a series of one-way traffic systems, which have implications on pedestrian safety and fuel consumption. One-way traffic is generally desirable only when complementary roads are available and the additional traveling distance is not more than 300 meters as per IRC. This ensures that whenever such systems are introduced, the interests of public transport modes and pedestrians are duly addressed.

Demand for parking in the CBD areas of Indian cities is twice the supply. Acute shortage of parking supply is seen in commercial areas; indiscriminate parking impedes the free flow of traffic and causes accidents.

Multi-Level Car Parking

A multi-level car parking system is meant to maximize car parking capacity by utilizing vertical rather than horizontal space. However, with land in the metros and 'A' grade cities becoming scarcer and dearer and plots getting smaller, conventional parking is proving infeasible. It is often found that ramps or car lifts consume so much parking area that no increase in parking capacity is possible. In such cases, mechanized car parking systems make creation of extra parking capacity feasible.



The Equivalent Car Space (ECS) that can be accommodated at a parking site would vary with the technology used. Types of multilevel parking currently available are:

Conventional Multi-Level

Conventional multilevel parking system can be underground, above ground or both under and above ground. The open parking structure is preferable to enclosed structures for above ground parking, as it does not require mechanical ventilation and specialized fire protection systems.



Automated Multi-Level

As against cars being driven on ramps or carried in car lifts to different levels in conventional multilevel parking, cars are driven at only one level for parking or retrieval. Cars are parked in steel pallets - a target pallet rides up or down to the driveway level at the press of a button for parking or retrieval. Technologies used for automated parking systems are of the following types:



1. Puzzle Type or Modular
2. Elevated Type or Tower
3. Multi-Level Floor Parking
4. Multi-Level Circulation Automated Parking System
5. Rotary type
6. TD (Stacker) System

Automatic multi-storey car parks involve lower building cost per parking slot, as they typically require less building volume and ground area than a conventional facility with the same capacity. However, the cost of the mechanical equipment that is needed within the building to transport cars internally needs to be added to the lower building cost to determine the total costs. Other costs are usually lower too; for example, there is no need for an energy-intensive ventilating system, since cars are not driven inside and human cashiers or security personnel may not be needed.

Automated car parks rely on technology similar to that used for mechanical handling and document retrieval. The driver leaves the car in an entrance module, and it is then transported to a parking slot by a robot trolley. For the driver, the process of parking is reduced to leaving the car inside an entrance module.

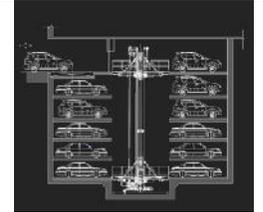
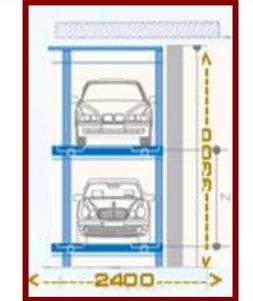
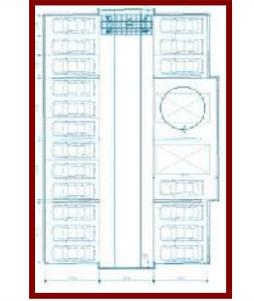
Advantages of Automated MLCPs

- A Multi-Level Vehicle Parking System ensures not only safety to the vehicles parked within it, but also ensures creating a Total Pollution Free Environment
- Full exploitation of land usage upto 90% is ensured compared to 67% in other comparable systems
- The hassle of searching for an empty spot would be eliminated
- Drivers can retrieve their vehicles from a secure waiting area and are less likely to risk their personal safety.
- Ideal for individuals with limited mobility or special needs.
- Automated parking system consumes less power for lighting.
- The plot area requirement for an automated parking system is less than a typical conventional car park system.

At peak periods, a wait may be involved before entering or leaving because loading passengers and luggage occurs at the entrance and exit location rather than at the parked stall. This loading blocks the entrance or exit from being available to others. Whether the retrieval of vehicles is

faster in an automatic car park or a self-park car park depends on the layout and number of exits.

Comparative Matrix Of Different Types Of MLCPs

Parameter s	Ramp Based Parking	TD (Stacker) System	Dependent Double Parking System or Independent parking system	Puzzle Parking-Fully Automated
Technical Overview (Snapshots)				
				
Installation Process	No special installation required	Easy installation process	Easy and economical installation	Easy installation process
Wear & Tear	Minimum wear and tear	Minimum wear and tear	Minimum wear and tear	Minimum wear and tear
Power consumption	Least power consumption	Minimum power consumption	Minimum power consumption	Requires power for 3 HP lifting motor and 0.5 HP lateral motor
Risk	Risk to human life as vehicles are parked manually	No risk for human life due to automated parking	May risk to human life due to failure in mechanized system	No risk for human life due to automated parking
Foot print	Maximum foot print area	Minimal foot print area	Foot print area reduced due double parking system	Minimal foot print area
Parking levels	10 floors of parking can be provided	Optimum 5 levels, max. 8 levels of parking can be provided	Maximum three levels of car parking available on each floor	5-6 levels of parking be provided
Time for parking	Maximum time required for parking	Requires less time for parking	May required more time due to ramps	Requires minimal time for parking
Time to Construct	1.5 - 2 years	Approximately 1.5 to 2 years	1.5 - 2 years (base building)	Approximately 1-2.5 months

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Workforce Requirements	Workforce on each parking level required	Workforce at entry and exit gates need to be provided	Workforce at entry and exit gates need to be provided	No workforce required for parking
Maintenance Cost	Minimum maintenance cost	Low Maintenance cost	5% per year	5% per year
Cost per Car Space INR	355,000	400,000 – 500,000	90,000 - 100,000	300,000 - 400,000

Various Multi Level Car Parking Initiatives in India

New Delhi Municipal Council: A modern integrated multi-level car parking complex was recently opened in the busy Sarojini Nagar area to decongest this popular marketplace. This project is to be developed by DLF for New Delhi Municipal Council (NDMC). The parking would accommodate 824 vehicles at an investment of INR 80 crore on a Built-Operate-Transfer basis. Similar car parking facilities are being planned at Baba Kharag Singh Marg and Kasturba Gandhi Marg.

Municipal Corporation of Delhi: A fully automated multi-level car parking complex is planned at Mandalia Chowk in Kamla Nagar. The parking complex is planned to accommodate 828 cars and 300 two-wheelers and will be constructed by the Municipal Corporation of Delhi at a cost of INR 110 crore within a period of two years. The MCD has identified 24 sites that will be developed into parking sites at Lajpat Nagar, Rani Bagh, Greater Kailash-I, Defence Colony, Karol Bagh, South Extension, Mori Gate, Greater Kailash-II, Qutub Road and Rajouri Garden.

Delhi Development Authority (DDA) has already invited tenders for nine plots to build multi-level parking lots in the Capital. These plots will be developed on a Public Private Partnership (PPP) basis similar to the model followed by the agency for its Nehru Place multi-level parking lot. The parking lots, which will have anywhere between three to seven levels depending on size and location, will be built at community centres or district centres in Dwarka, Janakpuri, Hari Nagar, Wazirpur, Okhla, Motia Khan, Mayur Place and Yamuna Vihar.

Navi Mumbai Municipal Corporation has planned to set up a multilevel car parking system at Vashi, Navi Mumbai, Maharashtra at two locations - Sector 17 and near the Civic Hospital - with a project cost of INR 10 crore. The car parking system will have two 11-storey tower car parks for accommodating 22 cars each and a three-level puzzle park for 43 cars. At Vashi Civic Hospital, there will be three 11-storey towers accommodating 22 cars each and a 7-storey puzzle car park for 110 cars. The total parking capacity will be 263 cars. In the tower system, a lift ferries cars to a height and parks them. In the puzzle system, which is wider than taller, cars are fitted into various vacant slots. Seven more mechanized car parks have been planned for; five of the multi-level lots will follow the tower system and two the puzzle system.

Ahmedabad Municipal Corporation: Kolkata-based Simplex Projects Ltd has received offers to set up an automated multi-level car park here. Simplex Projects has to its credit the country's first multi-level car parking system Parkomat at New Market in Kolkata. The design and

technology for car parking systems are acquired from Netherlands, Italy, Switzerland and Korea and are usually assigned projects on a built-own-operate-transfer basis.

Bangalore Mahanagar Palika is planning to construct five new multi-level car-parking complexes over the current year, 2014 at an estimated cost of INR 20 crore. Around 15 such new car-parking complexes will be built at an estimated cost of INR 60 crore. Car parking complexes have been planned in various parts of the city such as M.G. Road, Commercial Street, Shivaji Nagar, K.G. Road, Gandhi Nagar, K.R. Market, Mysore Road, Jayanagar Shopping Complex, Malleswaram and Seshadripuram. The BMP has already taken steps to construct three multi-level car-parking complexes on J.C. Road, Kempegowda Road and Magarath Road.

Hyderabad Urban Development Authority (HUDA) is planning a multi-level car parking complex in private partnership, close to the NTR Garden on the Buddha Purnima Road. An extent of 2.5 acres of area has been earmarked for the complex that would accommodate about 1,000 cars, besides 500 two wheelers.

Kolkata Municipal Corporation has been tying up with private companies to venture into automated MLCP in the city where there is immense space and parking crunch.

Conclusion

International case studies prove that providing innovative solutions to parking problems and introducing mass transit systems do a lot more than just solve traffic problems. Such solutions also result in increased real estate values in a city, since consumers are willing to pay more for the convenience.

One method of addressing the escalating shortage of parking spaces in shopping areas would be to restrict parking at few locations and imposing heavy parking fees. This would go a long way in creating space availability, making the pathways outside malls more pedestrian friendly and generally enhancing the livability of the city's urban environment.

Automated multilevel car parking facilities at important locations are also a viable way of addressing parking requirements. They can contribute significantly in reducing traffic congestion. These should ideally be developed near public transit points, within walking distance of key destinations. International property consultancy JLL is now actively advising many city authorities and developers on such solutions. MLCPs are now being implemented on a Design, Build, Operate and Transfer model via Public Private Partnerships.

In order to make such projects financially viable, the Strategic Consulting division at JLL India suggests that certain portions of the development be laid open for commercial exploitation. Incentives such as additional FSI and a revision in existing parking fees need to be offered to private developers in order to increase their interest levels in participating in MLCP projects. There is definitely scope for making these developments, which should now qualify as vital infrastructure, more popular.

The concerned authorities need to impose strict penalties on owners of commercial buildings who do not provide adequate parking facilities. At the same time, more FSI could be offered to developers for new developments in certain locations if they contribute free parking spaces.

Meanwhile, the recent introduction of automated parking meters in four of Chennai's key locations has the potential for introducing a new dimension of parking discipline. However, there is still a general lack of awareness about these parking meters and the purpose they serve. Along with awareness and compliance enforcement, the number of such meters also needs to be increased in various commercial areas of major cities.

Above all, policy reforms and their implementation are the most effective tools in providing efficient parking solutions and management. In the long run, citizens will need to revise their perceptions about the use of private vehicles and exhibit an increasing preference for public transportation.