

Review of Multi-Storey Car Parking Building

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Abstract - The population of the world is continuously on the increase and town and cities have grown up around their public transport system. The increasing population and expanding urban centers have been accomplished by increasing car ownership and increasing demand for movement for various purposes.

Multistory parking has come with a number of reliefs since they come with a no. of advantages such as optical utilization of spaces, for comfort for driver since the stress of struggling for parking space is taken of, more security and environmental harmony.

This research present the design of a multi-storey car park for the mitigation of traffic challenges in public areas using various case studies. various design aspect which are considered are arrangements of deck and ramp, planning the dimensions, the bay width, aisle width, ramp dimensions, planning grid, alignment paths to exit barriers, means of escape distances, travel distances from the car to the destination, security, visibility, space allowances and lift provision.

Keywords: (urbanization, traffic challenges, designs, multi-storey car park, structural analysis)

INTRODUCTION - car parking specially 'Off street parking' is the most concerning problem in urban cities, which is created by the increasing traffic and growth of motorized vehicle.

Multi-storey car parking is becoming increasing as they enable to conserve space however parking on the multiple floors brings its own challenges such as need of using lift mechanism for moving the vehicles from one floor to

another, co-ordination between the vehicle and the lift mechanism, co-ordination between parking and unparking of vehicles etc.

Multi-storey car parking are designed for capacity of about 400 to 500 cars. Larger capacity tends to increase the time for unparking a car. About 5 floor is also the upper limit for the same reason. The parking floors, the ramp, the entrance and the exits should be well lighted.

LITERATURE REVIEW -

Richard Arnott, John Rowse (2000)¹ Arnott and Rowse developed an integrated model of curve side parking and traffic congestion in a downtown area. Curve side parking is exogenously priced below its social opportunity cost, and the stock of cars cruising for parking, which contributes to traffic congestion, adjusts to clear the market for curve side parking spaces. Denser downtown areas have garage as well as curve side parking. Because of economies of scale in garage construction, garages are discretely spaced. The friction of space confers market power on parking garages. Spatial competition between parking garages, as model in Arnott determines the equilibrium garage parking fee and spacing between parking garages. Also, the stock of cars cruising for parking adjusts to equalize the full prices of curve side and garage parking. This paper combines the ingredients of these two models, hence presenting an integrated model of curve side parking, garage parking, and traffic congestion, and examines curve side parking policy in this context through a numerical example with parameters representative of a medium-sized US city. The central result is that raising the curve side parking fee appears to be a very attractive policy

since it generates efficiency gains that may be several times as large as the increased revenue raised.[1]

Eduardo Barata , Luis Cruz, João-Pedro Ferreira(2012)²

This study underscores the importance of adopting integrated parking management policies that ensure not only more rational use of the available parking spaces, evenly balancing supply and demand and bringing in revenues to cover the parking facilities costs, but also the improved attractiveness of alternative transportation modes. Parking supply and demand flows within the UC campus are estimated. The results indicate that the parking facility is under-priced and that there is overcrowding. To reflect critically on these issues and identify research areas to address their socioeconomic implications, a survey regarding the characterization of campus commuters and their travel options is presented. Logistic regression modelling is applied to determine the relative importance of UC campus commuters' attributes in their level of willingness to pay to have reserved parking on the campus. Finally, some policy proposals are discussed.[2]

Paul A. Barter (2013)³ this paper provides an international comparative perspective on non-residential, off-street parking policy in 14 large metropolitan areas in East, Southeast and South Asia. These are regions where parking challenges are widespread and acute. It utilises a new typology which groups parking policy approaches into 'conventional', 'parking management' and 'market-oriented' categories. Several distinct parking policy orientations are identified among the cities studied. Given their characteristics (most have relatively low car-ownership, high-density development and high usage of public transport) Asian cities might be expected to have off-street parking policies akin to those of many older areas in western cities. Yet, most of the Southeast and South Asian cities studied have parking policies that are surprisingly conventional and promoting of automobile-dependence. It is

less surprising that a number of cities, mostly in East Asia, do not have such an auto-centric conventional approach. However, it is a surprise that their parking policies still involve minimum parking requirements and have generally not adopted the most common alternative to the conventional approach (parking management).[3]

Saleh Abdulaziz Al-Fouzan (2012)⁴ The aims of this paper are to review the current practices of car parking standards in the UK, the USA, and the Kingdom of Saudi Arabia (KSA); to draw the main lessons learned from experiences of the UK and the USA; and to suggest suitable improvements in the standards of car parking requirements in the KSA. The paper follows a comparative approach in reviewing car parking standard requirements according to different types of land use in the UK, the USA, and the KSA. The article illustrates that transportation planners in the UK and the USA use parking policies, especially the application of car parking standards, along with other planning and transport measures to promote sustainable transport choices, to reduce reliance on cars, and to reduce traffic and air pollution. Local authorities in the UK and the USA have moved from requiring minimum standards for car parking to maximum standards. The aim of maximum parking standards is to decrease the number of trips made by private cars whilst seeking to maintain and enhance the viability of economic centres and support sustainable development. In the KSA, authorities still adhere to minimum car parking standards. Moreover, the car parking requirements are not correlated with city zoning systems. The paper concludes with some thoughts on how to improve the current parking requirements in KSA cities.[4]

Puay Ping Koh , Yiik Diew Wong (2013)⁵ This paper focuses on how land use environment influences pedestrians' needs and behaviour. Respondents were surveyed on their first/last mile trips, using face to face interviews conducted at nine transit stations' exits/entrances. It was found that more infrastructural

compatibility factors were rated as important in Industrial setting compared to Residential setting. The reasons for walking or not walking were also apparently different between the land use types. Lastly, a multinomial logit choice model was used to predict the propensity of walking and using other modes of transport.

Compressibility and strength characteristics of sand and tire mixtures for suitability of sand tire chip mixture for embankment. they concluded that upto 20% compressibility of sand-tire mixture was 1% i.e. in tolerance limit for 10m height of embankment and produced cohesion between 7-17.5 KPa and also internal frictional angle increased from 38 to 40 degree.[5]

Zhen (Sean) Qian , Feng (Evan) Xiao, H.M. Zhang(2012)⁶,

We investigate how parking fee and parking supply can be designed to mitigate traffic congestion, and to reduce total social costs. Viceroy's morning commute model is extended to incorporate travellers' choices between two parking areas (clusters). We first derive the travel patterns under different parking capacities, parking fees and accessibility to the destination; then perform a sensitivity analysis to reveal the effect of each factor on network performance and travel profiles. Some interesting findings are: (1) enlarging the central parking lots is not always desirable; (2) parking fee and capacity should be set in a way that commuters prefer to park in the farther area during early arrival; and (3) a shorter access time always reduces the social costs. Finally, we derive the optimal parking fees, capacities and access times which altogether yield the minimum total social costs. When the closer parking cluster does not have too large an accessibility advantage over the farther one, the optimal travel profile is such that both parking clusters are utilized. As a result, the optimal parking solution can effectively reduce both the social costs and the queuing delay. Even more intriguing is that, compared to the case without parking choices, all travellers are better off under the optimal parking solution, which cannot be achieved by only imposing a system-optimal dynamic toll.[6]

Conclusion:

- People have given positive response to charge introduced with regard Time Restriction and hence it can be stated that it can be an effective tool for management of parking demand.
- This policy may be effective for the Vadodara city and it is also effective for the city having a same population growth rate.
- Government can generate revenue from this policy.
- Their capacity and some are about to cross the capacity.
- Parking licence plate method analysis suggests that majority of parking lots has already crossed.
- Travel parameters like trip length, frequency of visiting, fuel expenditure, vehicle ownership and walking time from parking to destination have identical significant for response to chargeable for off-street parking policy at study area.
- Prohibition of parking in peak hours is to be varied based on the variation in the peak accumulation in their respective parking lots.
- The high demand for parking spaces in the horizon years could be effectively met by the development of automated parking system.

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