

DEMAND AND SUPPLY ANALYSIS OF PARKING IN MAJOR COMMERCIAL SPACES IN CHITTAGONG CITY – A CASE STUDY OF CHITTAGONG SHOPPING COMPLEX AND LGED BUILDING

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ABSTRACT

In Chittagong, quick urbanization, advancement in transportation, enhancement of people's living standard and availability of low cost fuels motivate people to use motorized vehicles. This vast amount of vehicles need accommodation place in both residential houses and commercial spaces. Parking is an essential part of transportation system. On-street auto parking and illegal parking are currently making serious transport problems within main highways of Chittagong town. This particular paper aims at determining actual car parking situation at main public and private spaces of CDA avenue road by taking sample of a govt. office and a public shopping complex that are extremely busy. For this reason the site-specific research had been carried out rather than city or nationwide perseverance associated with car parking features. The required data has been collected by two types of car parking direct surveys- parking space inventory and parking usage survey by patrol, carried out upon two individual working days addressing 4 hours intervals. After performing analysis it is found that most of the time the parking spaces are occupied by the particular vehicles. Finally, this study will provide latest and reliable information about the parking scenario of Chittagong city and this will help to advocate parking policies for Chittagong Metropolitan Area basically for the commercial and office spaces.

Keywords: Parking Accumulation; patrol survey; off street parking

INTRODUCTION

Parking is very essential element and fundamental issues in urban area for controlling transportation and communication factors. Not only need for an urban area but also need to manage transportation systems in rural area the requirement of parking space is beyond description. By the way the parking system needs to be well efficient and organized to serve the demand. The estimated population is 4.1 million in an area of 177 sq. Km (Centre for Urban Studies(CUS), 2006). Chittagong is the 2nd largest city and port city of Bangladesh. Chittagong has also great importance in economy and the economy is directly or indirectly fully depends on transportation system. That's why Chittagong has been also facing great load on transportation. Although the scenario of Chittagong is much better from other larger cities like London, Tokyo, New york but it is on the most developing heavy traffic zone (Corporation). So a lot of parking spaces are required to accommodate the transports. As per BRTA source the average right of way of the major roads of Chittagong 100 to 130 feet. Every day a significant percentage of drivers in single-occupancy vehicles search for a parking space. Detailed recommendations for provision of on street parking were made in Annex B5 of the "Immediate action plan" report (Authority, 2008). As per CDA master plan, 2008 commercial buildings over 4 floors in height should have one floor or its equivalent area dedicated to vehicle parking. According to vehicle ordinance, Chittagong City Corporation is in charge to introduce on street and off street parking areas for vehicle in Chittagong metropolitan area and control illegal parking. Though the rules were found in policies the reflection of those rules didn't found in implementation.

LITERATURE REVIEW

Vehicle connotes the principle qualification in a very method of travel process. And typically it has the affect on often the proficiency connected with targeted visitors mobility evades all of our attention. This is due to all of our conception connected with method of travel will be limited together with the myth of

motion although vehicle will involve the illness in the event the autos usually are standing. It can be to become critical a significant dealing with often the method of travel process given it has effects on the actual supply of an urban center (Litman, 2013) . Inside the circumstance regarding escalating privately owned automobile title. So that you can recognize the specific situation or perhaps determine the particular best interests regarding problems, the regarding auto parking room, degree regarding it is makes use of and also dedication regarding auto parking requirement is quite crucial. It is also needed to calculate the particular auto parking costs and also lifelong auto parking. According to the terrain make use of qualities the need regarding auto parking may differ, which can be impacting the availability details. This specific will become a lot more essential inside a degenerated vehicles supervision circumstance that way current inside Dhaka metropolis just where a lot of people would rather make use of automobiles inside the active business facilities. Regularly and many significantly the actual issue is based on identifying the actual essential need that should become accommodated. The actual Start associated with Transport Technicians (ITE) in the time period statement created a suggestion indicating the amount of car parking bays necessary for 1000 sq. ft. of every group of property utilize. With regard to shops, ITE suggested 5.05 car parking bays with regard to 1000 sq. ft. section of this particular property utilize (ITE, 2010) . This region consists of stores as well as eating place areas due to its substantial impact upon car parking need (ITE, 2010), Parking Occupancy- Data collection, 2013. ITE has created this particular regular within a circumstance in which a large numbers of excursions are created through vehicles as well as wherever option transportation choices minimum (Soup, 1999) . There are a number of research related to parking has already been done in Dhaka city, but there was no such effort done with Chittagong city that deals with off-street and on-street parking. Off-street auto parking implies auto parking your car everywhere yet around the roadways. These are generally typically auto parking amenities. Off-street auto parking may be the two in the house and also out-of-doors. Off-street auto parking also incorporates privately owned a lot and also vestibule. On the other hand, on street parking implies auto parking car by the side of the road or both side of the road. The parking space inventory survey was needed to identification of the parking space where the parking is done and was also needed to measure the parking demand, where patrol survey was helpful (Zannat, 2013).

METHODOLOGY

To find out the existing condition of the parking area several surveys have been conducted in many times. The existing parking surveys falls into two categories, first one is area parking survey and another is site-specific parking survey (Council, 2013). Area parking survey considers all available parking spaces of an area. As a result it contains all available possibility of shared parking among different land uses. So, it provides the information about compatibility of parking supply and demand considering local zoning requirements.

The site-specific parking survey is conducted in a small area or a land use to find out the local parking supply and demand (Council, 2013). The data which is found form the survey provides more realistic parking characteristics of the area. It is also batter than the traditionally developed national level parking ratios runs the risk of providing unused extra spaces and thus resulting wastage of money.

The existing parking demand and supply conditions of Chittagong shopping complex and LGED building have been explicated through seven measures of parking – parking accumulation, parking volume, parking load, parking turnover, average parking duration, parking spill-over and probability of rejection. These seven parking measures have been evaluated by using the data gathered by conducting two parking surveys parking space inventory and parking usage survey by patrol (Kadiyali, 1997). To collect data the surveys had been done on two separate working days. In first day, parking inventory survey had been done to collect data on the quantity, type and location of parking space actually or potentially available for parking in those areas. Parking usage survey by patrol had been done in next day which included counting parked vehicles number at 15 minutes intervals through a period of four hours, covering both the morning and evening peak periods. Pilot survey showed that the influx of customers were high during 10:00 to 12:00 and 16:00 to 18:00. This excludes the period in the early morning when the market is yet to open and the lunch period in the afternoon.

STUDY AREA

This two under study commercial buildings have all types of parking facility and deals with huge traffic in every working day. Which two surveys have been done for collecting data this two building covers all criteria for parking demand supply analysis. Chittagong shopping complex is located in CDA Avenue in Chittagong which has front parking. The parking space is situated on the premises of the 2 storied building which makes huge parking demand like other busy places in the city. On the front of the building there are provision of 51 vehicle parking spaces and an undesignated circulation space by the side which sometimes used as parking space. There were another sampled site was selected for survey named LGED building located near Sholashahar railway station with ground and front parking. Its underground parking dimension is 115'x90' with a huge entrance sloping downward. Front parking dimension was 125'x90'2" The dimension of ground parking was 95'x40' which provides the provision of parking of 15 motorcycle vehicles.



Fig. 1: Study area map (Source: Google Earth)

RESULTS AND DISCUSSIONS

Existing Parking Condition

Chittagong Shopping complex is located near 2no gate beside the CDA Avenue highway. The parking area of the Chittagong shopping complex is surface parking. The open space in front of the market is used for parking. This parking area is designated for cars. But most of the sign of designation has been removed. Total parking area of the shopping complex is 7231 sq. Feet. There are 51 parking lots in the parking space. These parking lots are perpendicular to the shopping complex structure. In Chittagong Shopping complex there is no specific parking sign for cars and vehicles. Most of the parking lots are used by C.N.G taxi or motorbikes. At the parking bay there is no entry or exit points. Vehicles park on the bay haphazardly most of the time. Chittagong City Corporation is the owner and on managerial duty of the market.

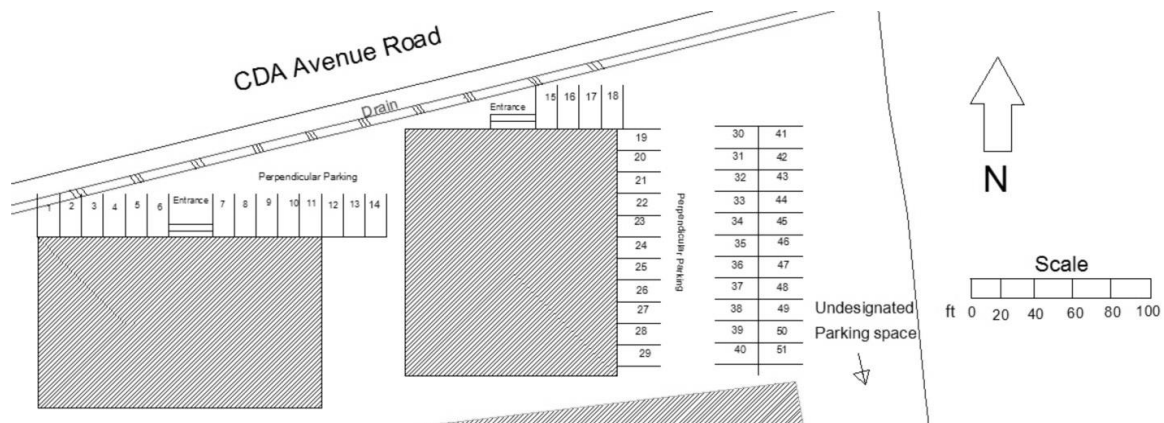


Fig. 2: Parking inventory plan of Chittagong Shopping Complex (Source: Field survey, 2014)

LGED building is located near sholashahar railway station. It has ground parking, underground parking and front parking. The underground parking has a dimension of 115'×90'. Its parking capacity is 30 private cars. It has a huge entrance of 30'×20' sloping downward. The front parking is 125' in length and 90'2" in width. It has a capacity of maximum 20 private cars. It is surrounded by ornamental plants. At the entrance there is a guard room of 10'×10'. The ground parking has a dimension of 95' length and 40' width. Its parking capacity is maximum 15 vehicles most of which are motorcycle.

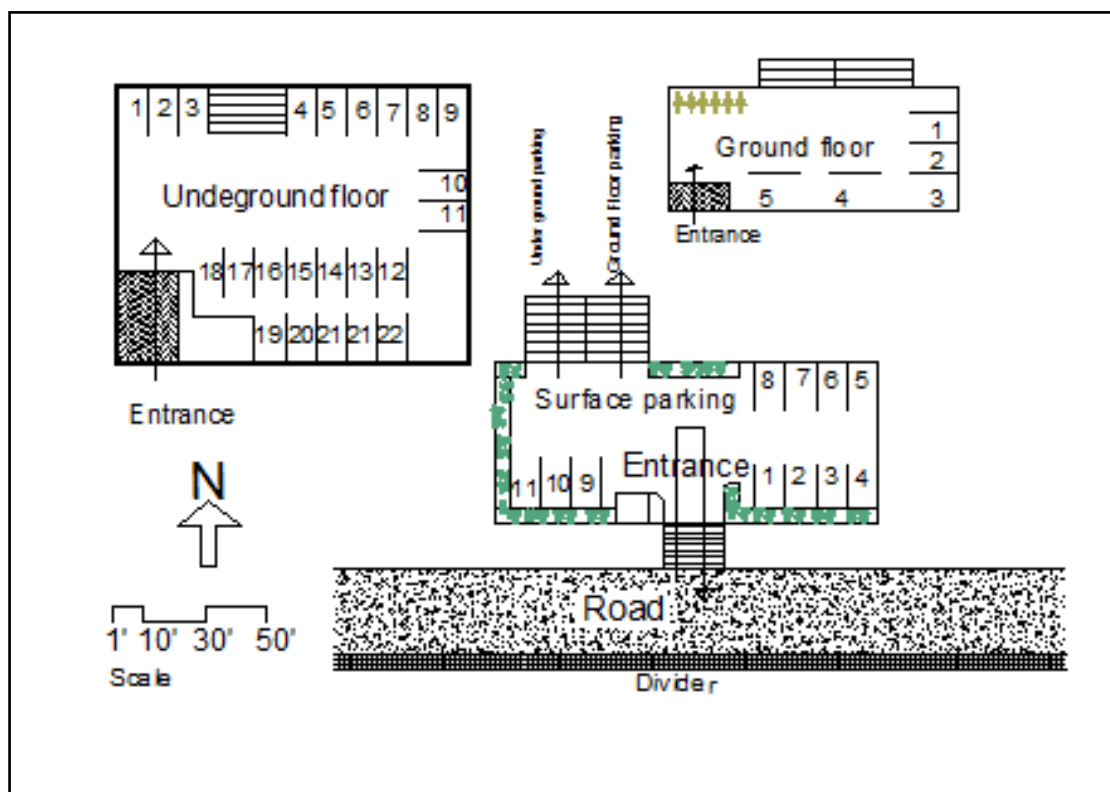


Fig. 3: Parking inventory plan of LGED building (Source: Field survey, 2014)

Parking Usage Survey by Patrol

It has been seen from the [Fig. 4] that number of cars of Chittagong Shopping Complex is very less in the morning time. Maximum number of parking spots remains empty in the morning time. The maximum time a car staying in a parking spot is 2 hours & the time it was in 4-6 PM. The minimum time spending a car was found only 15 minutes. The average supply of parking at Chittagong Shopping Complex is 9.5 & it is the 25.6% of the total area. The overall volume has been 38 vehicles per hour. The number of vehicle parked at a given instant of time is shown in the Fig-4. Some motorcycles and C.N.G have also been parked in this space along with private cars. It has been found from Fig-4 that the maximum

number of cars parked in Chittagong Shopping Complex is at the time range of 4.30-4.45 PM where vehicle number is 14. It has also been found that the minimum number of cars parked at Chittagong Shopping Complex is at the time range of 10-10.15 AM which is 6.

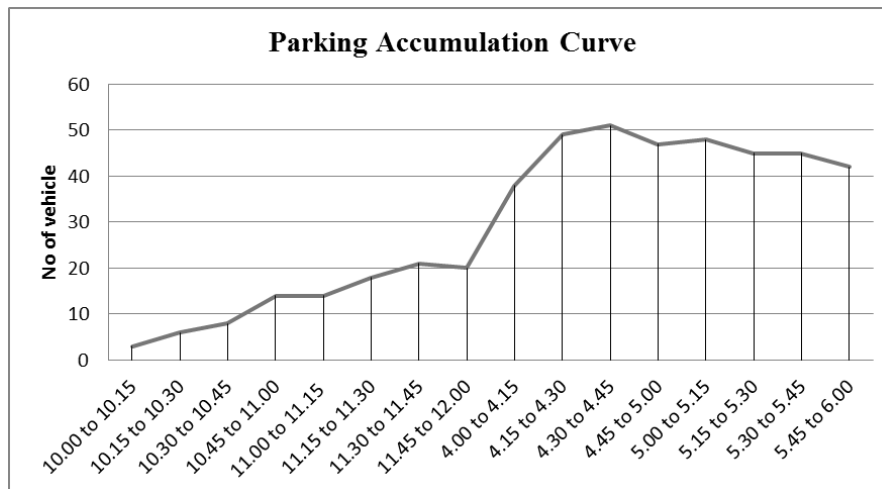


Fig. 4: Parking accumulation curve of Chittagong shopping complex (Source: Field survey, 2014)

In case of LGED building is found that the number of parking vehicle increases continuously from 10:00 am when working time start. At middle of the noon the maximum number of vehicle park at the building. In the peak hour vehicle has been parked in front of the building as an illegal on street parking. Generally the employees use the underground parking. In the time of seminar or program on that building creates huge parking demand which is not full fill by the existing parking facilities. Finally, to meet the existing demand more 40 parking lots has demanded.

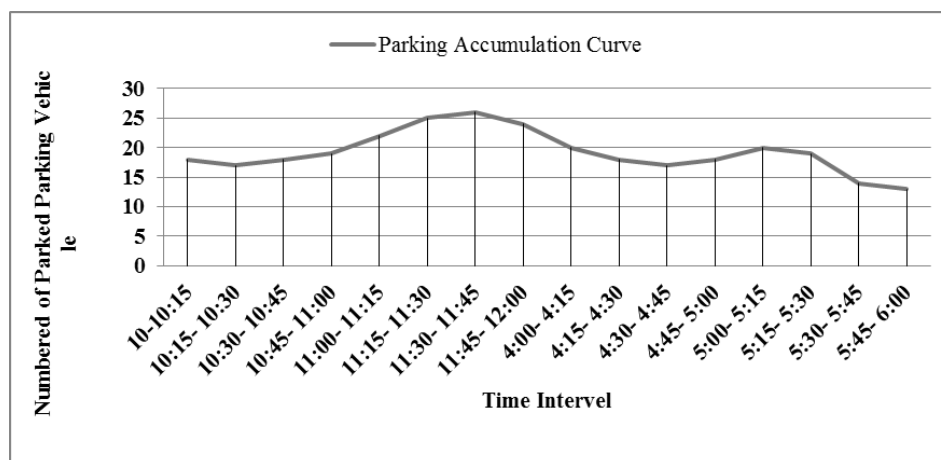


Fig. 5: Parking accumulation curve of LGED building (Source: Field survey, 2014)

RECOMMENDATIONS

1. Illegal on-street parking in front of commercial spaces should be removed so that regular traffic flow of vehicle remains undisturbed on the main road.
2. The regular parking charge should be increased in such amount that the car owners will tend to park their cars for less time as possible.
3. All parking areas for individual vehicles should be marked clearly which will provide clear direction to park the vehicle properly
4. The parking space available in the sampled site is inadequate in serving parking facility to the users. Current parking space should be increased and shared parking and multi storied parking can be introduced to solve the increasing parking need in the site.
5. People should be encouraged to use public transport instead of use private vehicle like car.

CONCLUSIONS

Considering one commercial and one office building may help to understand the parking scenario of the commercial spaces of Chittagong city. If the average spill-over found from the survey is taken into consideration, most of the time the parking area is fully loaded. There is much gap between the demand and supply of those areas. It is found that 30 more parking bays in Chittagong shopping complex need and 40 in LGED Building to be added to avoid front on street parking. Since this increase in supply would not alone reduce the parking pressure, it should be supplemented by optimum parking pricing policy. The parking facilities provided in this area is off-street parking and there is also some on-street parking which occupies the limited road space designated for movement of traffic. Therefore, on-street parking cannot be a reasonable solution on the parking problem and should be discouraged accordingly. Finally, it can help to provide a advocate parking policies for Chittagong Metropolitan Area basically for the commercial and office spaces.

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