**Analysing the issue of on-street parking in commercial areas: A case study of Hyderabad city Pakistan**

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**Abstract**

In developing countries, rapid urbanization has created an enormous pressure on the land use, infrastructure, and transportation. The fast-growing ratio of motorized vehicles in the urban areas is the main cause of environmental degradation. Almost 80% of the greenhouse gas emission is from the vehicles in the cities. In the city centers, on-street parking is considered as the major cause of traffic congestion. The aim of this study was to evaluate the problems of on-street parking, disorderly parking at Central Business District (CBD) of Hyderabad city. The field survey methodology was adopted to perceive the current traffic problems in the city center and traffic count survey was carried out in both peak and off hours. The data was analyzed through descriptive statistics frequency analysis technique with the help of Statistical Package for the Social Sciences (SPSS). The findings revealed that, increasing number of vehicles, on-street parking, improper parking, encroachment, inadequate parking space and poor condition of roads are the main causes of traffic congestion. The study is imperative in a sense because its bridge up the research gap of determining public views about the on-street parking challenges in the context of Hyderabad, Pakistan and provide statistical results which may equally adaptable by policy makers and transportation planners in order to improve the traffic situation.

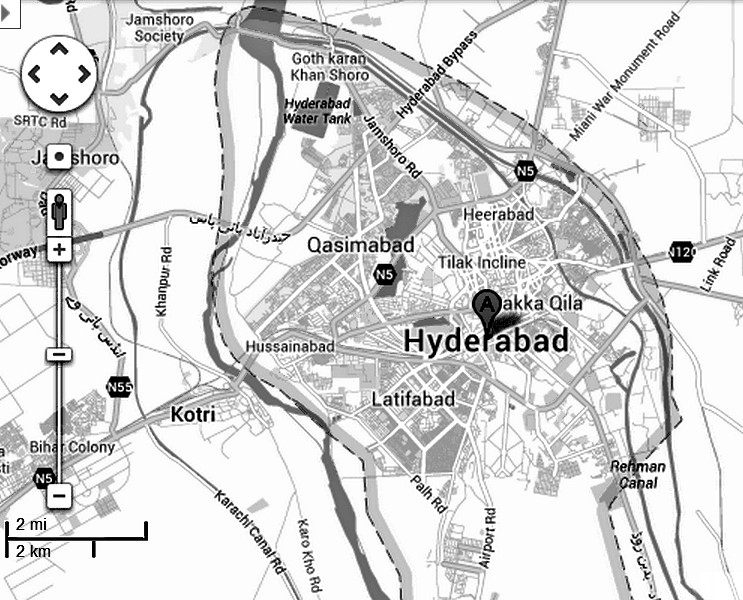
**Key words:** On-street Parking; Traffic count survey; Urbanization; Traffic Congestion.

**INTRODUCTION**

The transport plays an important role in daily life and without it, the requirements of well-being would be difficult to attain (Asiyanbola & Akinpelu A.A., 2012). Transportation systems provide access to land and influence growth patterns with economic activities, which helps in shaping area’s economic health and quality of life (Transportation Planning Capacity Building Program, 2007). Sustainable development goals also address the transport and access to healthcare, education and other human needs (Institute for Transportation and Development Policy, 2015). As the transport has direct and indirect involvement in our daily needs, therefore it also has some negative effects (Asiyanbola & Akinpelu A.A., 2012). The acceleration of urban motorization leads to worsening the urban traffic environment (Yan-ling, Xin, & Ming-chun, 2016). Fast-growing vehicles and limited parking lots formed a sharp contradiction and caused the phenomenon of “parking difficulty and parking disorderly” (Yan-ling et al., 2016). Parking facilities also considered as the indicator for sustainable and livable Transport Planning (Litman, 2015). The adaption of parking supply and demand management strategies offer solutions to the many problems facing a sustainable transportation system, including transit performance, delay reduction, travel time reliability and capacity utilization (Steiner, 2012). Urban centers which offers a variety of activities such as markets, offices, churches, shops, and other similar places often create a massive parking demands, and cause a reason of on-street parking due to the unavailability of required parking space (Aderamo & Salau, 2013) Nowadays, the parking problems have been one of the most discussed topics by the general public (Liu et al., 2012). The main problem, therefore, is that the available parking capacity could not be provided for the peak demands and therefore waiting and delay times, which are products of traffic congestion, are inevitable prolonged (Ogundare & Ogunbodede, 2014). This situation causes the environmental issues such as pollution and affects the socio-economic life of the reside (Olorunfemi, Adebola, Edwin, .E, & Stephen, 2014).

Thwala et al., (2012) examines the causes of traffic congestion in Ibadan city and found the on-street parking one of them. They used questionnaire survey to collect data and utilized descriptive statistics technique to get desired results. In another study conducted in urban Ghana, lack of parking management systems and insufficient area for parking was found as the major cause of traffic congestion. This study also adopted descriptive statistics with the aid of Statistical Package for Social Sciences (SPSS) and suggested to improve the present traffic situations. As, parking difficulties are considered as the most notable urban transport problems (Thwala et al., 2012), a source to cause short or long run traffic congestion (Organisation for Economic Co-operation and Development (OECD) & European Conference of Ministers of Transport (ECMT), 2007) and closely related to environment pollution (Liu et al., 2012). Therefore, the study examines the existing parking conditions of the study area and resident’s perceptions about the parking conditions.

For the present study, Resham Gali, CBD of Hyderabad city is selected for a case study by considering the time and economic resource factor. It is considered as an old and longstanding market of Hyderabad, as some of its buildings were built in the pre-partitioned of Indo-Pak (Rehman, 2016). Hyderabad city is the second largest city of the Sindh province (Parmar & Jalbani, 2005) and ranked as eighths biggest city in Pakistan according to its population (Pakistan Bureau of Statistics. Government of Pakistan, 2017). On the globe, its position lies in between 25º 22´ 45" North and 68º 22´ 6" East (Korai, Mahar, & Uqaili, 2016). It is almost 150 km far apart from Karachi, capital of Sindh province (Korai, Mahar, & Uqaili, 2014). Its map is represented geographically in Fig 1.



*Figure 1.Geographical location of Hyderabad City (Korai et al., 2016)*

In urban centers, on-street parking makes traffic situation chaotic. Sometimes urban centers have narrow access roads with insufficient off-street parking services that may cause on-street parking. As Resham Gali is an urban center of Hyderabad city; thus, on-street parking may inevitable which cause the traffic congestion and travel time delay (Olorunfemi et al., 2014).

Keeping in mind the present situation of the study area, research aim was selected carefully to determine the on-street parking problems and its challenges lie in the eyes of travelers and common people. Hypothesis was developed by considering the descriptive nature of study.

H0 = There is no Parking problem leading to traffic congestion in study area

H1 = Parking problem exists and leads to the traffic congestion in study area

**METHODS**

In order to identify the presence of parking problem and traffic congestion, traffic enumeration exercise accompanied with questionnaire survey was carried out at some selected points (Osoba, 2012). Congestion points were identified through field observations in the study area. Field survey was done during the peak hours between 7am-10am and also between 4pm to 7pm as per the local area context where people go to work in morning and come back in evening (Ogundare & Ogunbodede, 2014).

The study adopted convenience sampling technique for collecting information from the respondents (Asiyanbola & Akinpelu A.A., 2012). Convenience sampling allows researchers to select a sample of convenience in which elements have been selected from the target population on the basis of their accessibility or convenience to the researcher (Ross, 2005).Questionnaire were developed with the helpful inputs from academia and face to face interviews were conducted to fill up the questionnaire. The area selected for the present study was commercial, and most of the people were not ready to give the answers because of their buys schedule and hurry to go to work/home. In order to cope up with this limitation, a number of 100 questionnaire were filled during questionnaire survey and this decision was made due to the fact that lowest number to be used in data analyses is 100-150 (Mahmoudi, Ahmad, & Abbasi, 2015). This small size of sample considered suitable as the homogenous surroundings of selected commercial area. The collected data were analyzed using descriptive statistical techniques. (Asiyanbola & Akinpelu A.A., 2012). In-out survey was also adopted for defining parking statistics effectively (Mathew, 2014).

**RESULTS AND DISCUSSION**

As the study area consists of various commercial activities. Therefore, it arise the need to understand the traffic situation of the area. Current research accepted the traffic enumeration exercise method for collecting data about traffic flow, Peak and off hours were defined through survey and traffic counts were presented in graphs.

**In-out Survey (1: 00 PM to 2:00 P.M)**

The researcher conducted the traffic count survey to take a view of the ongoing traffic condition. The time of (1: 00 PM to 2:00 P.M) was considered as off-hour by considering the traffic flow. According to the traffic count survey, 16 no. of Cars and rickshaw, 9 bikes and 5 Suzuki’s was observed to enter into the study area ‘’Hyderabad Market” (Resham Gali) at specific time period 01:00 pm to 02:00 pm as shown in Figure 2. Through the traffic count survey, it was also observed that 2 Cars, 9 rickshaws, 4 bikes and 2 Suzuki's exit from the study area (Resham Gali) at specific time period 01:00 pm to 02:00 pm as illustrates in Figure 3.

*Figure 2 Vehicles entered in selected area*

*Figure 3 Vehicles exit from selected area*

**In-out survey (05:00 pm to 07:00 pm)**

Traffic count survey at peak hour (05:00 pm to 07:00 pm) showed that 59 no. of Cars, 70 rickshaws, 21 bikes and 3 Suzuki’s, entered into the selected area as shown in Figure 4. But, 46 no. of Cars, 65 rickshaws, 3 bikes and 2 Suzuki leave the selected area at peak hours 06:00 pm to 07:00 pm. The difference in the vehicles entered and vehicles exit means that some vehicles were parked on the road which is already very narrow access space causing the traffic congestion and travel time delay.

*Figure 5. Vehicles exit from selected area*

*Figure 4. Vehicles entered in selected area*

**Respondent’s perceptions:**

Respondent’s perception regarding on-street parking was recorded through questionnaire survey and data were analyzed to get desired results. In respondent’s view, only 17% considered that there was no unfair parking the selected area but the majority of them claims of facing unfair parking as 83% of them say yes for it as shown in figure 6. Another attribute of the major cause of congestion, nearly 33% of respondents recorded their answer in favor of poor road infrastructure but 67% are those who consider on-site parking as a reason of major cause of traffic congestion as illustrates in Figure 7.

*Figure 7-Cause of congestion in respondent's opinion*

*Figure 6. Presence of unfair parking on road*

The study investigates that the root cause of the time delays has been observed due to the traffic congestion which may result in on-street parking. Figure 8. indicates that mainly 40% of the respondent faces 05-10 min time delay, 35% of the respondent answered of 10-15 min time delay and 25% of the respondent suffer from delay of 15-20 min. Responses were also recorded for the public satisfaction with current parking situation which presented in Figure 8. It can be seen that approximately 74% of respondents were those who faced difficult parking situation while only 26% do not face any difficult parking situation as they satisfied with this parameter. It is observed that majority of respondents were dissatisfied with present parking conditions as described in Figure 9

*Figure 9. Public satisfaction about the present parking situation*

*Figure 8. Traffic time delays due to traffic congestion*

Respondents were also asked about the difficulty of finding a parking place. It is indicated in Figure 10. that 90% of respondents usually face difficulty in finding a parking place and only 10% easily found a parking place. It shows the miserable parking conditions of the selected area. Respondents were also asked about their observed time of facing maximum parking problems, as the all of the respondents were native citizens of the selected area. Figure 11. shows that 60% respondents observed maximum parking problem in evening time as it was considered as peak hour, only 3% observed parking problems in morning, 24% observed parking problems in Afternoon and 13% also observed parking problems in the night. From these observed statistics, it can say that the selected area has insufficient space to park vehicle which yields into the traffic congestion and parking management problems. The findings of present study replicate the situation discussed by Asiyanbola & Akinpelu A.A., (2012) at some extent and highlight the need to look at this issue. Meanwhile, this research findings showed the parking issue at the local context of Hyderabad City which was neglected in past studies.

*Figure 11. Observed time in which you face maximum parking problems?*

*Figure 10. Have you been facing difficulty in finding parking place?*

**CONCLUSION**

Research addresses the on-street parking problems in urban center. Results indicated that on-street parking has been considered as the major cause of traffic congestion and time delays by the respondents. In-out survey results provide the better understandings of current traffic situation in study area. At the same time, the public perception about the parking facility in CBD of Hyderabad city indicated that, existing roads are not enough wide to entertain on-street parking. Most of the residents feels difficulty in finding the space to park their vehicles which results in dissatisfaction of public towards the Parking situation. As the study analyzed the existing condition of parking at the urban center that’s why it is imperative to provide an information base for parking management authorities and concerned agencies. This study may also help the policymakers in order to understand the parking requirement and management during peak hours. By considering the parking situation of the city center and analytical results, it can be recommended to shift on-street parking to off-street parking to allow the public to park their vehicles more safely. A proper site should be designed for off-street parking nearby city centers. Moreover, to curb on-street parking, the taxes should be increase and efforts should be taken to promote pedestrian movement in the city centers. Alternate routes should be designed to stop allowing vehicles to go through the city center. In future, a detail study should be conducted eradicate the traffic and parking problems from the city centers to expand the present study findings. A detail survey should be conducted from experts (academia and professionals) and their suggestions should be incorporate in the policy documents to improve the overall parking of the CBD.

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**REFERENCES**

Aderamo, A. J., & Salau, K. A. (2013). Parking patterns and problems in developing countries : A case from Ilorin , Nigeria. *African Journal of Engineering Research*, *1*(2), 40–48.

Asiyanbola, R. A., & Akinpelu A.A. (2012). The challenges of on-street parking in Nigerian Cities’ transportation routes. *International Journal of Development and Sustainability*, *1*(2), 476–489. Retrieved from http://isdsnet.com/ijds-v1n2-32.pdf

Institute for Transportation and Development Policy. (2015). The Role of Transport in the Sustainable Development Goals - Institute for Transportation and Development Policy. Retrieved September 4, 2016, from https://www.itdp.org/the-role-of-transport-in-the-sustainable-development-goals/

Korai, M. S., Mahar, R. B. U. X., & Uqaili, M. A. (2016). Estimation of Energy Potential from Organic Fractions of Municipal Solid Waste by Using Empirical Models at Hyderabad, Pakistan. *Mehran University Research Journal of Engineering & Technology,* *35*(1), 129–138.

Korai, M. S., Mahar, R. B., & Uqaili, M. A. (2014). Assessment of Power Generation Potential from Municipal Solid Wastes : A Case Study of Hyderabad City , Sindh , Pakistan. *Pak.J.Anal.Environ.Chem*, *15*(1), 18–27.

Litman, T. (2015). *Well Measured: Developing Indicators for Sustainable and Livable Transport Planning*. Retrieved from http://www.worldcat.org/title/well-measured-developing-indicators-for-sustainable-and-livable-transport-planning/oclc/776812630

Liu, Y., Wang, W., Ding, C., Guo, H., Guo, W., Yao, L., … Tan, H. (2012). Metropolis Parking Problems and Management Planning Solutions for Traffic Operation Effectiveness. *Mathematical Problems in Engineering*, *2012*, 1–6. https://doi.org/10.1155/2012/678952

Mahmoudi, M., Ahmad, F., & Abbasi, B. (2015). Livable streets: The effects of physical problems on the quality and livability of Kuala Lumpur streets. *Cities*, *43*, 104–114. https://doi.org/10.1016/j.cities.2014.11.016

Mathew, T. V. (2014). LectureSeries (10) - Transportation Systems Engineering 41. Parking Studies. Retrieved September 19, 2016, from https://www.coursehero.com/file/10879962/LectureSeries-10/

Ogundare, B. A., & Ogunbodede, E. F. (2014). Traffic Congestion and Parking Difficulties in Akure Metropolis, Nigeria. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, *19*(8), 01–07. Retrieved from http://www.iosrjournals.org/iosr-jhss/papers/Vol19-issue8/Version-2/A019820107.pdf

Olorunfemi, S. O., Adebola, O., Edwin, K. A., .E, O. E., & Stephen, M. (2014). Examination of On-Street Parking and Traffic Congestion Problem in Lokoja. *Civil Engineering and Environmental Research*, *6*(4), 95–104.

Organisation for Economic Co-operation and Development (OECD), & European Conference of Ministers of Transport (ECMT). (2007). *Managing Urban Traffic Congestion*. *OECD/ECMT*.

Osoba, S. B. (2012). Appraisal of Parking Problems and Traffic Management Measures in Central Business District in Lagos, Nigeria. *Journal of Sustainable Development*, *5*(8), 105–116. https://doi.org/10.5539/jsd.v5n8p105

Pakistan Bureau of Statistics. Goverment of Pakistan. (2017). *Population of major cities census - 2017 population top 10 cities*. Retrieved from http://www.pbscensus.gov.pk/

Parmar, V., & Jalbani, A. A. (2005). Investment Trends in Hyderabad , Pakistan. *Journal of Independent Studies and Research (JISR)*, *3*(2), 29–32. Retrieved from The investment trend in Pakistan fluctuated from province

Rehman, Z. (2016). The story of Hyderabad, Sindh. Retrieved September 18, 2016, from http://blogs.tribune.com.pk/story/32552/the-story-of-hyderabad-sindh/

Ross, K. N. (2005). *Sample design for educational survey research*. *Quantitative research methods in educational Planning* (Module 3). UNESCO International Institute for Educational Planning. Retrieved from http://www.unesco.org/iiep/PDF/TR\_Mods/Qu\_Mod3.pdf

Steiner, R. L. (2012). *Impact of Parking Supply and Demand Management on Central Business District (CBD) Traffic Congestion , Transit Performance and Sustainable Land Use*. Florida.

Thwala, W. D., Eluwa, S. E., Akintunde, M., Ojo, K. A., Duncan, E. E., & Gafar, Y. O. (2012). Traffic Congestion, Causes and Effect on Residents of Urban Cities in Nigeria. In *The Asian Conference on the Social Science* (pp. 213–225). Osaka, Japan.

Transportation Planning Capacity Building Program. (2007). *The Transportation Planning Process: Key Issues A Briefing Book for Transportation Decisionmakers, Officials, and Staff*. Retrieved from http://www.planning.dot.gov/documents/briefingbook/bbook.htm

Yan-ling, W., Xin, W., & Ming-chun, Z. (2016). Current Situation and Analysis of Parking Problem in Beijing. *Procedia Engineering*, *137*, 777–785. https://doi.org/10.1016/j.proeng.2016.01.316