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A Comprehensive Traffic Volume Study of Qasim Chowk Hyderabad, Sindh, Pakistan

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Abstract: *Any unplanned town is likely to face multiple issues as the population rises; such as; traffic congestion problems vehicles increases with a rise in population, industrial development, business operations, etc. Hyderabad is a major jobs hub for nearly 5 million individuals from both Hyderabad and rural regions. Attracting individuals who are looking for a job. Therefore, during peak hours traffic congestion is evident. The study goal is to discover reasons and solutions for congestion. For them, we will conduct surveys, evaluate and attempt to provide the best alternatives to enhance effectiveness, customer comfort, and intersection and reduce accident danger. This study provides an assessment of paths beginning from the different directions of Qasim Chowk in terms of traffic quantity, traffic conditions at junctions, and people's traffic patterns. This type of case study can help enhance traffic conditions by implementing the easy alternatives and suggestions given in this report.*

Key Words: Traffic Count Survey, Traffic Volume Survey, Qasim Chowk, Hyderabad, Sindh

Introduction

Hyderabad is the headquarter of the Hyderabad Division in Pakistan's Sindh province. It is Sindh's second biggest city and Pakistan's seventh largest. Hyderabad, founded in 1768 by Mian Ghulam Shah Kalhoro of the Kalhora Dynasty, functioned as a province capital until 1840 when the British shifted the capital to the Bombay presidency. It lies roughly 150 kilometres (93 miles) inland from Karachi, Pakistan's largest metropolis, with which it is linked by a direct railway and the M-9 highway. Between 1947 to 1955, Hyderabad served as the capital of Sindh province. The Partition of India led to a large-scale migration of the city's Hindu population, albeit Hyderabad, like much of Sindh, did not see the severe riots that occurred in Punjab and Bengal. According to the 2017 Pakistan Census, the population of Hyderabad is 1,732,693. Since the 1998 Census, the city has acquired 565,799 people, marking a 48.5% rise – the lowest growth rate among Pakistan's ten major cities.

The industrial sector accounts for 25% of Pakistan's GDP, with a strong concentration of industry spanning from Karachi to Hyderabad. The Karachi-Hyderabad area is home to 75% of Sindh's industry. The Sindh Industrial Trading Estate, which had 439 industrial units, was created on the outskirts of Hyderabad in 1950 and thrived until the 1980s urban turmoil. Much of the city's industrial foundation was undermined in the 1980s by ethnic conflict in urban Sindh, while inadequate infrastructure and electrical supplies have also impeded expansion.

Traffic Engineering is a civil engineering industry, that uses engineering methods to ensure the safe and effective transportation of persons and products on roads(Memon et al., 2020; Memon, Sahito, et al., 2021; Shaikh et al., 2020; Soomro et al., 2021; Talpur et al., 2016). It primarily investigates the secure and helpful motion of transport, like the geometry of road or (road geometry) and crossover, cycling substructure, road surface designs(markings), traffic Marking, and traffic lights. Traffic engineering also plays a vital role in the transportation system,

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excluding the substructure provided (Ghaffar et al., 2021; Memon, 2010; Sahito et al., 2020; Shah et al., 2021; Sharma et al., 2011; Talpur, Chandio, et al., 2014). Distinctive traffic engineering tasks require designing facilities and changes in traffic control devices, including traffic signs, signals, and sidewalk markings, even so, traffic technicians are also cautious about traffic security by researching places with greater collision rates and creating countermeasures to reduce accidents (Shaikh & Chandak, 2014). This project is about traffic volume study, the survey of the essential route in Hyderabad city (MEMON, 2018; Memon, Kalwar, Sahito, & Napiah, 2021; Memon, Kalwar, Sahito, Talpur, et al., 2021; Memon, Napiah, Hussain, et al., 2016; Memon, Napiah, Talpur, et al., 2016). After completing all the surveys, observations, solutions, and recommendations are provided for improved traffic conditions and convenience of users (Brohi, Kalwar, et al., 2021; Brohi, Memon, et al., 2021; Gill et al., 2020; Kalwar et al., 2020; Kalwar et al., 2019; Memon et al., 2014; Talpur, Madzlan, et al., 2014).

The planned city is intended to be developed and expanded in the future, whereas the unplanned city is not easy to develop (Marvi et al., 2022; MEMON, 2018; Memon, Kalwar, Sahito, Talpur, et al., 2021; Memon, Napiah, Talpur, et al., 2016; Memon et al., 2022). The traffic volume survey was carried out in a very congested area (Qasim Chowk) in Hyderabad to resolve its traffic congestion-related problem.

Qasim chock as shown in Figure is the main intersection in Hyderabad city which connects almost four different routes of cities. almost half of the traffic in the city passes through it which creates the worst type of traffic congestion and causes difficulties for the citizens (Gill et al., 2020).

The following measures were taken to achieve these goals:

- A complete survey of concerned Routes
- Counting of traffic passing through routes
- Individual columns for each vehicle
- Taking permissions from Security agencies on Cantt:
- Shooting video of vehicles to reduce the chances of errors
- Comparison of manual and digital readings

Route Selection

The first route is coming from the Qasim Chock bus stop towards N5 City Gate. (from Jamshoro road towards City gate) . The second route goes from the Qasim Chowk bus stop towards National Highway 5, going towards Qasimabad (City Gate Road, Combined Military Hospital area, and Qasimabad Area). The third route goes Combined Military Hospital Road towards City Gate Road, Jamshor road, and Qasimabad. The fourth route from Qasimabad to City Gate Road, the Combined Military Hospital area, and Jamshoro road.

Figure 1. Qasim Chowk Intersection (Source: Google Map)

Figure 2. Live Traffic position at Qasim Chowk Hyderabad (Source: Google Map)

Traffic Survey/ Traffic Volume Study

The method primarily determines the quantity of traffic on the roads during a given moment. Intrusive Method: Counting stations where sensors are placed in or on the roadbed. Non-intrusive Method: counting systems that involve remote observational techniques.

A traffic survey is very essential because it can, increase the effectiveness and life of roads, reduces the quantity of traffic in a specific segment, provide better means of infrastructure growth, provide better means of using other roads for unique activities in the town Provide an estimate of no cars against no people. This study adopts a non-intrusive traffic survey method.

Manual Counting Method

- A very traditional technique involving the recording of car or pedestrian motions by observers at particular places.
- Observers use tally sheets in their easiest way to record.
- It can record traffic figures, traffic types, and travel instructions. Manual counts raise safety concerns.
- Video Image Detection Method
- Use of video cameras to record the number, type, and velocity of vehicles. Various software for analyzing video pictures is accessible. The weather may restrict precision.
- What was used?
- We have prepared tally sheets that include different kinds of cars and surveys have been performed by entering vehicle numbers.
- We used video recording in one study for cross-checking and precision of tally sheets.

TRAFFIC SURVEY RESULTS

Time of Survey

What is peak hour?

A rush hour or peak hour is a component of the day when road congestion and public transport crowding are at their highest.

- Traffic personnel at the town hall intersection told us that from 12 PM to 2 PM, traffic volume has been generally higher.
- 4 surveys between 12 PM to 1 PM 1 survey between 9 am to 11 am 1 survey between 5 PM to 6 PM

Tally Sheet for Manual Traffic Counting Survey

The Tally sheet as shown in Figure 3, for manual traffic counting is usually used and it has been adopted for this study as well.

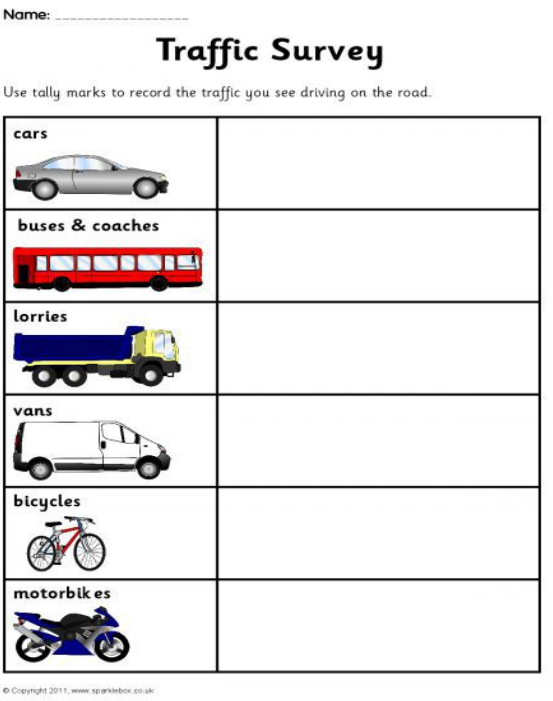

Figure 3: Tally Sheet for manual traffic count

Survey Results

Survey one from City gate towards Combined Military Hospital (Combined Military Hospital) was conducted on 5th August 2019. Survey time was 12.30 PM to 1 PM. The method of Survey: Manual Counting & Video Image Detection. The survey results for manual counting are as; vehicle density (City Gate to Combined Military Hospital): 1637 per hour. The average time between two vehicles: is 0.454 seconds. Video image detection for vehicle density (towards Qasim Chowk) was 1644 per hour. The average time between two vehicles: is 0.456 seconds. The accuracy was 99.75. Furthermore, other route results are described below.

The method primarily determines the quantity of traffic on the roads during a given moment. Intrusive Method: Counting stations where sensors are placed in

or on the roadbed. Non-intrusive Method: counting systems that involve remote observational techniques. A traffic survey is very essential because it can, increase the effectiveness and life of roads, reduces the quantity of traffic in a specific segment, provide better means of infrastructure growth, provide better means of using other roads for unique activities in the town Provide an estimate of no cars against no people. This study adopts a non-intrusive traffic survey method.

SURVEY 1-City Gate to Jamshoro (at Qasim Chowk) was conducted on 5th August 2019. Survey time was 12.30 PM to 1 PM. The method of Survey: Manual Counting & Video Image Detection. The survey results for manual counting are as; vehicle density (City Gate to Jamshoro): 1164 per hour. The average time between two vehicles: is 0.323 seconds. Video image detection for vehicle density (towards Qasim Chowk) was 1171 per hour. The average time between two vehicles: is 0.325 seconds. The accuracy was 99.75.

SURVEY 2-City Gate to Combined Military Hospital (at Qasim Chowk) was conducted on 5th August 2019. Survey time was 12.30 PM to 1 PM. The method of Survey: Manual Counting & Video Image Detection. The survey results for manual counting are as; vehicle density (City Gate to Combined Military Hospital): 653 per hour. The average time between two vehicles: is 0.181 seconds. Video image detection for vehicle density (towards Qasim Chowk) was 659 per hour. The average time between two vehicles: is 0.183 seconds. The accuracy was 99.75.

Survey 2 - Jamshoro to City Gate (at Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Jamshoro to City Gate): 1227 per hour
The average time between two vehicles: 0.340 s

Video Image Detection

Vehicle density (at Qasim Chowk): 1236 per hour
The average time between two vehicles: 0.343 s
ACCURACY: 99.75

Survey 2 - Jamshoro to Saddar (At Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Jamshoro to Saddar): 1721 per hour
The average time between two vehicles: 0.478 second

Video Image Detection

Vehicle density (At Qasim Chowk): 1729 per hour
The average time between two vehicles: 0.480 seconds
ACCURACY: 99.75 per cent

Survey 2 - Jamshoro to Combined Military Hospital: (at Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Jamshoro to Cantt:): 477 per hour
The average time between two vehicles: 0.132 seconds

Video Image Detection

Vehicle density (At Qasim Chowk): 479 per hour
The average time between two vehicles: 0.133 seconds
ACCURACY: 99.75 per cent

SURVEY 3 - Saddar to Jamshoro (At Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 01:00 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Saddar to Jamshoro): 1488 per hour
The average time between two vehicles: 0.413 seconds

Video Image Dectection

Vehicle density (At Qasim Chowk): 1492 per hour
The average time between two vehicles: 0.414 seconds
ACCURACY: 99.75 per cent

Survey 3 - Saddar to City Gate (at qasim chowk)

Date: 5th of August 2019
Survey Time: 12.30 pm to 1 pm
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Saddar to City Gate): 691 per hour
The average time between two vehicles: 0.191 seconds

Video image Detection

Vehicle density (At Qasim Chowk): 695 per hour
The average time between two vehicles: 0.193 seconds
ACCURACY: 99.75 per cent

Survey 3 - Saddar to Cantonment: (At Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Saddar to Cantt:): 749 per hour
The average time between two vehicles: 0.208 seconds

Video Image Detection

Vehicle density (At Qasim Chowk): 784 per hour
The average time between two vehicles: 0.217 seconds
ACCURACY: 99.75 per cent

SURVEY 4 Cantt to Saddar (at Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Cantt: to Saddar): 587 per hour
The average time between two vehicles: 0.163 seconds

Video Image Detection

Vehicle density (At Qasim Chock): 591 per hour
The average time between two vehicles: 0.164 seconds
ACCURACY: 99.75 per cent

Survey 4 - Cantt: to City Gate (At Qasim Chowk)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Cantt: to City Gate): 489 per hour
The average time between two vehicles: 0.135 seconds

Video Image Detection

Vehicle density (at Qasim Chowk): 495 per hour
The average time between two vehicles: 0.137 seconds
ACCURACY: 99.75 per cent

Survey 4 - Cantt: to Jamshoro (at Qasim Chow)

Date: 5th of August 2019
Survey Time: 12.30 PM to 1 PM
Method of Survey: Manual Counting & Video Image Detection

Survey Results

Manual Counting

Vehicle density (Cantt: to Jamshoro): 466 per hour
The average time between two vehicles: 0.129 seconds

Video Image Detection

Vehicle density (At Qasim Chowk): 498 per hour
The average time between two vehicles: 0.138 seconds
ACCURACY: 99.75 per cent

Route Observations

Table 1. Qasim Chowk Intersection

Name/Location Of Intersection	Qasim Chowk
Type Of Intersection	4 - Way Intersection
Signalized/Unsignalized	Signalized
Traffic Personal For Traffic Control	Yes
Traffic Islands	
Road Marking For Safety Of Pedestrians	Yes
Peak Traffic Hours	12 PM to 2 PM
Road Way Light	

Conclusion

After conducting manual counting and video picture detection traffic surveys, we came to the following conclusions.

Manual Traffic Survey

Manual counting is a nice way to study the quantity of traffic, which requires no machine. • However, preci sion is impacted by o Peak hour traffic o Number of s urveyors o Point monitoring position • Maximum of two kinds of cars should be monitored for greater pre cision.

Video Image Detection

- The video picture detection technique is precise; the camera is positioned at the correct place and the correct height.
- But it is a time-consuming job to rewind recording and counting cars.8.2: Suggestions

City Gate to Saddar Road Suggestion

- Road marks for the safety of pedestrians.
- Road extension to enable smooth, non-turning traffic flow.
- It should be limited to stopping cars, particularly car rickshaws close to the junction.
- Staff during peak hours: 12 PM to 2 PM
- Entry of heavy cars during peak hours of the d ay should not be permitted.
- Auto rickshaws and 2-wheelers can use one highway as well as anoth er for buses and 4-wheelers.To limit auto rickshaw parking between the two lanes, lane dividers should also be built.
- The use of bikes among learners should be enc ouraged.
- Bus service can be started at Hyderabad's major pick-up points from 3 PM to 4 PM.
- During peak hours, the alternative route should be used

Reference

Brohi, S., Kalwar, S., Memon, I. A., & Ghaffar, A. (2021). Using the theory of planned behaviour to identify the behavioural intention to use public transportation service: the case study of Karachi circular railway. *International Journal on Emerging Technologies, 12*(6), 317-322.

Brohi, S., Memon, I. A., Kalwar, S., & Sahito, N. (2021). Predicting The Use Of Public Transportation Service: The Case Study Of Karachi Circular Railway. PalArch's *Journal of Archaeology of Egypt / Egyptology, 18*(03), 4736-4748. https://archives.palarch.nl/index.php/jae/article/view/7575

Ghaffar, A., Kalwar, S., Memon, I. A., Brohi, S., & Sahito, N. (2021). Evaluating accessibility of public parks through gis: a case study of tando allahyar city. *Palarch's journal of archaeology of egypt/egyptology, 18*(2), 758-771.

Gill, R., Kalwar, S., & Memon, I. A. (2020). Yeh's Satisfaction Index Modelling of Tenants in Rental Appartments (A Case Study of Latifabad Hyderabad). Sukkur IBA Journal of Computing and Mathematical Sciences, 4(2), 1-10. https://doi.org/10.30537/sjcms.v4i2.654

Kalwar, S., Memon, I. A., & Qureshi, S. (2020). Significance of National Spatial Planning for Economic Development of Secondary Cities in India: Critical Analysis of JNNURM Programme. *Sukkur IBA Journal of Computing and Mathematical Sciences, 4*(2), 49-60. https://doi.org/10.30537/sjcms.v4i2.658

Kalwar, S., Sahito, N., Memon, I. A., Hwang, J., Mangi, M. Y., & Lashari, Z. A. (2019). National Planning Strategies for Agro-based Industrial Development in Secondary Cities of Sindh Province, Pakistan. *Sustainability, 11*(24), 70-66. https://doi.org/10.3390/su11247066

Marvi, H., Soomro, M., & Memon, I. A. (2022, June 2022). Influence of Socio-economic Factors on Mode Choice of Employees in Karachi City. *Global Economics Review 7*(2), 13. https://doi.org/http://dx.doi.org/10.31703/ger.2022(VII-II).11

Memon, I. A. (2010). *Factors influencing travel behaviour and mode choice among Universiti Teknologi Malaysia employees*. Universiti Teknologi Malaysia.

Memon, I. A. (2018). *Mode Choice Modelling to Shift Car Travelers Towards Park and Ride Service in the CBD of Putrajaya and Karachi Universiti Teknologi PETRONAS*.

Memon, I. A., Kalwar, S., Sahito, N., & Napiah, M. B. (2021). Factors That Influence Travelers Willingness To Use Or Not Park-And-Ride Service In Putrajaya And Karachi CBD. *PalArch's Journal of Archaeology of Egypt/Egyptology, 18*(2), 720-734.

Memon, I. A., Kalwar, S., Sahito, N., Qureshi, S., & Memon, N. (2020). Average Index Modelling of Campus Safety and Walkability: The Case Study of University of Sindh. *Sukkur IBA Journal of Computing and Mathematical Sciences, 4*(1), 37-44. http://orcid.org/0000-0002-4305-8662

Memon, I. A., Kalwar, S., Sahito, N., Talpur, M. A. H., Chandio, I. A., Napiah, M., & Tayyeb, H. (2021). Mode choice modelling to shift car travelers towards park and ride service in the city centre of Karachi. *Sustainability, 13*(10), 5638. https://doi.org/10.3390/su13105638

Memon, I. A., Madzlan, N., Talpur, M. A. H., Hakro, M. R., & Chandio, I. A. (2014). *A Review on the Factors Influencing the Park-and-Ride Traffic Management Method.* Applied Mechanics and Materials.

Memon, I. A., Napiah, M., Hussain, M. A., & Hakro, M. R. (2016). *Influence of factors to shift private transport users to Park-and-Ride service in Putrajaya. In Engineering Challenges for Sustainable Future*: Proceedings of the 3rd International Conference on Civil, Offshore and Environmental Engineering (ICCOEE 2016, Malaysia, 15-17 Aug 2016),

Memon, I. A., Napiah, M., Talpur, M. A. H., & Hakro, M. R. (2016). Mode choice modelling method to shift car travellers towards Park and Ride service. *ARPN Journal of Engineering and Applied Sciences, 11*(6), 3677-3683.

Memon, I. A., Sahito, N., Kalwar, S., Hwang, J., Napiah, M., & Zaly Shah, M. (2021). Choice Modelling of a Car Traveler towards Park-and-Ride Services in Putrajaya to Create Green Development. *Sustainability, 13*(14), 7869. https://www.mdpi.com/2071-1050/13/14/7869

Memon, I. A., Soomro, U., Qureshi, S., Chandio, I. A., Talpur, M. A. H., & Napiah, M. (2022). *Multilayer Perceptron Modelling of Travelers Towards*

Park-and-Ride Service in Karachi. In A. Akhnoukh, K. Kaloush, M. Elabyad, B. Halleman, N. Erian, S. Enmon Ii, & C. Henry, Advances in Road Infrastructure and Mobility Cham.

Sahito, N., Kalwar, S., Memon, I. A., Mangi, M. Y., & Hussain, A. (2020). Examining rapid land-use variation using multicriteria decision analysis (mcda) method. *International Journal, 76*(7/1). https://doi.org/10.21506/j.ponte.2020.7.7

Shah, M. H., Memon, I. A., Talpur, A. H., Sethar, W. A., & Das, G. (2021, 22 March 2021). Factors Influencing Private Transport Users to Shift Towards Public Transport In Karachi. *Engineering Science And Technology International Research Journal (Estirj), 5*(1), 61-66.

Shaikh, F., & Chandak, M. (2014). An approach towards traffic management system using density calculation and emergency vehicle alert. *IOSR Journal of Computer Science (IOSR-JCE),* 24-27.

Shaikh, K., Memon, A., Memon, I. A., Laghari, Z. A., & Memon, A. M. (2020). Awareness regarding Coronavirus pandemic among the population of Sindh, Pakistan: A cross-sectional study. *Sukkur IBA Journal of Computing and Mathematical Sciences, 4*(1), 28-36.

Sharma, D., Singh, U. S., & Mukherjee, S. (2011). A study on road traffic accidents in Anand-Gujarat. *Health line, 2*(2), 12-15.

Soomro, F., Kalwar, S., Memon, I. A., & Kalwar, A. B. (2021). Accessibility Factor for Boulevard Shopping Mall, Hyderabad City, Pakistan. *International Research Journal of Innovations in Engineering and Technology, 5*(10), 19-22. https://doi.org/10.47001/IRJIET/2021.510004

Talpur, M. A. H., Chandio, I. A., Memon, I. A., Napiah, M., & Jafri, K. H. (2016). A brief review on the role of regional transport accessibility in the development process of distant sub-regions. *Indian Journal of Science and Technology, 9*(13), 1-9. https://doi.org/10.17485/ijst/2016/v9i13/62116

Talpur, M. A. H., Chandio, I. A., Memon, I. A., & Qureshi, T. A. (2014). Computer-based database system: rapid response for rural planning agencies to devise transport policies. *Indian Journal of Science and Technology, 7*(10), 1603-1612. https://doi.org/10.17485/ijst/2014/v7i10.29

Talpur, M. A. H., Madzlan, N., Irfan, A., Chandio, I. A., & Hussain, S. (2014). Time-Space Geography: A Creditable Transport Accessibility Measure for Rural Dwellers. *Applied Mechanics and Materials, 567*, 763-768. https://doi.org/10.4028/www.scientific.net/AMM.567.763