

Analysis of Road Infrastructure Problems in Urban City, Karachi

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Abstracts: Road infrastructure is a significant part of the economic development of countries. Better performance of road communication system is significant part of all over the world. Developed countries make a significant effort for designing a well-managed traffic arrangement for the individuals. Furthermore, an efficient transport system is the key element for improving the country's economic conditions. Sustainable and efficient traffic management system is the backbone for humanizing the economic growth of developing countries. In case of Pakistan, Karachi is the main industrial hub for whole country's economy and accommodates enormous number of migrants. Due to this reason the population of city is increasing day by day. This paper presents the current situation of road infrastructure troubles in Karachi. The urban city is facing several numbers of issues that were already documented by researchers such as traffic congestion and road safety problems. On an urgent basis an efficient mass transit system is required to reduce the traffic jam conditions. The transport system of Karachi requires instant proper management rules and designed transport facilities. The aim of the paper is to identify the main traffic problems of the large urban city, Karachi, which is faced by the people in their daily life and to suggest recommendations for reducing the current situation related to traffic management strategies. The research methodology for this paper will be based on qualitative analysis of the road infrastructure troubles that are identified by the individuals through interviews and detailed group meetings.

Keywords: Road Infrastructure, Traffic, Congestion, Economy, Traffic Management Strategies

1. INTRODUCTION

Infrastructure is significant part in an economic development. Infrastructure can play an important factor in raising the nature of mankind's capital, accomplishing high and efficient sustainable levels of development additionally increasing an economical level of growth. Improved transportation system has an apprehensively better impact on the poor; however, infrastructure assumes a key part of decreasing income disparity. A well-performing transport system is crucial to a country's improvement [1].

1.2 Overview of Karachi Road Infrastructure System

Karachi is the 8th largest city on the globe with its over 15 million individuals and an urban sprawl for 1,300 sq km, also is the main industrial hub for Pakistan's economy. Karachi is described by an accelerating rate of sub-urban Growth. However, the city road infrastructure problems are also increasing due to the expansion of urban growth and mismanagement of traffic system. The city needs to be seen a 35-fold expand its number and a 16-fold expansion over its spatial extension since those rises about Pakistan. Moreover, estimates would that by those quite a while 2015, the city might achieve a populace of about 19.2 million for a twelve-month development rate for through 5% [2].

In the case of Karachi, its fast populace and spatial development need to prompt a sharp expansion required for urban transport services and the city experiences a lack of essential facilities like housing units, water supply, electricity, in addition improved mass transit and public transport system[2].

The expanded urbanization and monetary growth in the city bring place an enormous weight ahead travel demand. The history of the city was clearly represented that vehicle force were overwhelmed by cars and motorcycles, which represent 92% of the vehicles, similarly as contrasted with 6% for para travel vehicles, and only 2% for public transport vehicles. This huge influx of cars and motorcycles on roads and roadside parking can play a key role in immense log jam particularly in the focal areas of the city which is increased travel time to reach one place to another place within the city [3]. as shown in figure:1

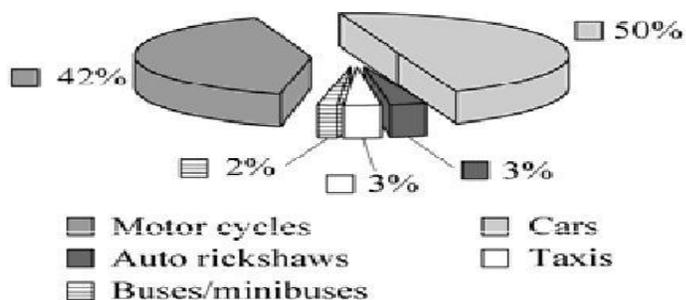


Figure:1 Average commute travel time [3]

The urban transport framework is principally road-based in Karachi. The largest urban area of Karachi supports a 7,400 km road network organized with a thickness about a 207km way for every 100 km² of territory. The road infrastructure of city is ignored, poor maintenance of primary, secondary and tertiary roads, exchange routes are not legitimately described in additionally, absences of movement administration strategies. These issues of the road infrastructure system of Karachi is increasing day by day due to negligence especially in regulating and monitoring of enforcement agencies[5].

Today urban areas depend upon there transport framework to improving economic conditions, infrastructure, socio-environmental manageability. The transport framework of Karachi needs an immediate policy and making decisions for improving socioeconomic conditions through better infrastructure system. The effects of improper road infrastructure system are traffic congestion, accidents, air and noise pollutions, movement crashes, wastes time delay, declines productivity in addition, imposes a cost for the public arena. The research is based on these negative effects minimized after recognizing the fundamental variables for road infrastructure issues in the large urban area of Karachi, however, neutralizing measurement could be made to deal with these elements [6].

2. PROBLEM IDENTIFICATION

Extensive work has been done in the related field, but due to ever growing population rate and changes in the structure of Karachi has required to analyze main road's infrastructure problems such as inadequate parking spaces and facilities for vehicles, difficulties of traffic management flow, absence of traffic management techniques, lack of workable traffic signals, and especially inadequate public transport and traffic congestion are highlighted troubles. However, it requires a careful planning and an efficient management system.

The above main factors which are selected as variables in this research are responsible for "major disputes of road network system in Karachi" and have been investigated and analyzed through different angles.

3. OBJECTIVE

The main aim of the paper is to explore the problems faced by the people regarding the road network system in Karachi and to provide suitable suggestions to improve the current situation of the road traffic system.

Sub objectives are as under:

- To analysis the critical issues of road infrastructure system in Karachi.
- To identify the basic problems of citizens are faced during the daily routine life regarding the road network system.
- To propose recommendations to resolve the road communication system disputes.

4. MATERIEL AND METHODS

- 4.1** Secondary information was gathered through research papers and other survey reports related to transportation crises in Karachi.

Primary data have been gathered through field survey, and interviews of different respondents. Throughout gathering for first-hand data, the field survey was done. The meetings were done with different drivers about general population transport, and personage vehicle holders about overall population, moreover group interviews were also done randomly.

- 4.2** There are preferably 3-4 people in one group with the similar type of people (similar on certain characteristics that are relevant to the research problem) and are guided by a moderator into haring their ideas, experiences, observations, feelings etc. regarding the topic.

- 4.4** Keys to obtaining satisfactory results from unstructured interviews are to ask open-ended questions, avoidance of yes-no questions, using of questions that can encourage participants to share their experiences and problems are facing regarding the traffic management and road problems.

- 4.5** Study design is based on the cross-sectional study, and it aimed at finding out the prevalence problems of the road network system in Karachi by taking the unstructured interviews from the three categories participants such as private transport users, public transport users, both public and private users. The cross-sectional study design would be used to assess people's attitudes towards road and traffic conditions in the city. The study involves one contact with the study inhabitants due to the limited time. The cross-sectional study design is more useful in obtaining the objectives of the study.

- 4.6** In this study, data were collected at different areas of Karachi through primary sources for stance interviews and author personal observations. It should be kept in mind that all the interviewed people lived in the different areas of Karachi and also commuted to different areas, so the common factors found was not branded for one specific location. The randomly selected people belonged from different backgrounds in terms of income level, the area of Karachi and age group. The author also tried to focus on those people who used only private transportation and public means to commute within the city. This was done to understand the mindsets, behavioral, problem facing regarding the road and demands of different people.

The study is limited to the record of major problems faced by the people regarding the road infrastructure system of Karachi and mainly information is recorded using survey reports, interviews also personal observations, in addition, the existing condition of traffic congestions and mismanagement system is documented through pictorially analyzed.

The possible recommendations are included as a part of the research proposal. These suggestions comprehend the challenging situation of monitoring and implementation of traffic control strategies in minimizing major disputes of road infrastructure system.

5. ANALYSIS AND DISCUSSION

- 5.1** This section analyzes the user's perspectives regarding the major road traffic problems of the metropolitan city Karachi. As previously described in the research method, unstructured interviews were taken from 100 individuals that were randomly selected and group interviews also conducted. The groups are alienated by the income classes to recognize the main troubles of each class independently to get the similar problems. However, the interviews with different respondents were highly descriptive to obtain the different type of problems.

- 5.2** The different income cases were selected for interview, and they belonged to Gulshan-e-Iqbal, Federal.B.Area, Gulshan-e-Johor and Sadder areas of Karachi but they were travel in all around the city.

Therefore, the respondents identified the problems that were generally faced in daily time of traveling in different areas of the city. The age of 18-50 years was selected for the study. The interviews were divided into three income levels such as low income, middle income, and high income.

- The low-income class uses communal transport for long distances while for short distance, either motorcycle, bicycle or walk.
- The middle-income class varies between the genders, now many males have started to switch to the option of motorcycles, but this class is mostly dependent upon public transport. Some of them were used private cars.
- The high-income class uses cars for both shorter and longer distances.

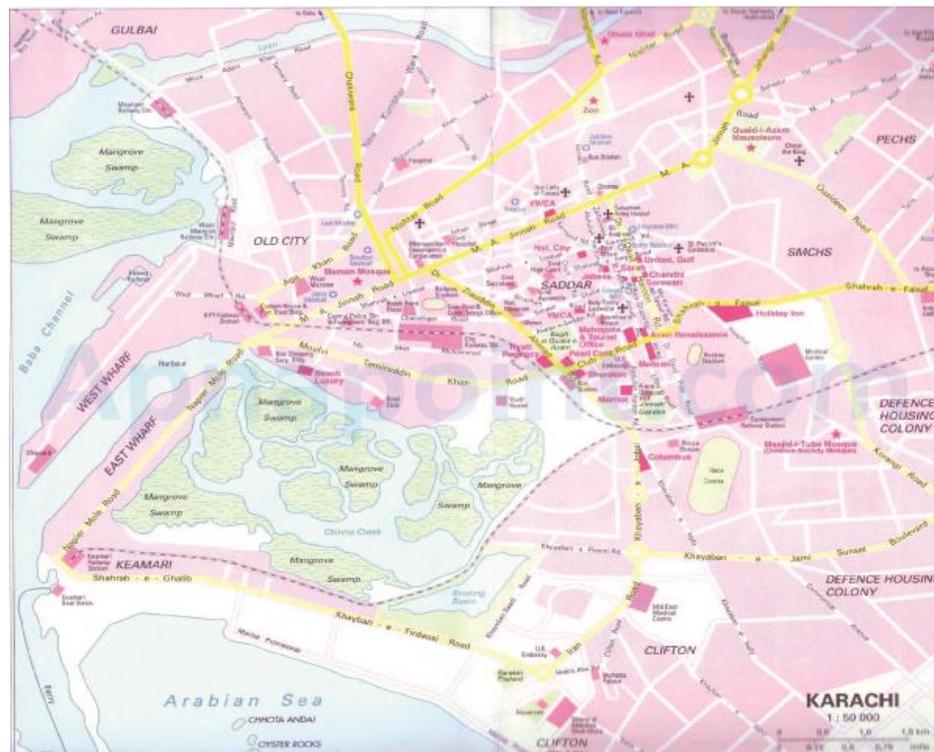


Fig:2 Karachi Map (Source: www.CDGK.com)

6. FINDINGS OF UNSTRUCTURED INTERVIEWS

6.1 Traffic Congestion

The key problems are highlighted by the 50% respondents like pedestrian and motorcycle traffic accidents were increased due to lack of safety rules and regulations, day by day weakening conditions for pedestrians and communal transport facilities this factor goes towards the traffic congestion.

And 30% of individuals have said that commercialization along the major road networks are increased day by day, and encroach the road land for parking caused by more congestion and unsatisfactory environment are produced for the users. Furthermore, 20% is conveyed that construction of signal-free corridors, underpass, and completion of many road construction projects inside inner-city areas and outskirts have improved traffic flow and reduced congestion during peak hour but remain the problem of the traffic jam.



Fig:3 Traffic congestion



Fig 4: Urban City Road Infrastructure is not viable

6.2 Key Problems of Traffic Jams

- **Rush Hour**

The individuals of the group interview were highlighted that there are three different time slots like morning between 8 am to 9:30 am, afternoon 1:00 pm to 2:00 pm this is the schools closing time also the lunch break time in offices in these time slots most of the persons travel in around the city, therefore, the roads become congested. In addition, the cause for the traffic-packed throughout this moment is the lack of parking facility near to the schools and restaurants. Sometimes way of the road is fully covered by parked cars and other encroachments play a main part in the traffic congestion.

The main peak hour slot is between 5:00 pm to 7:00 pm described by the respondents are they get back from the offices when they stuck in traffic jam. This situation is mostly seen at main road networks which connect Karachi's center to other parts of the city.

- **Buses**

The minivans and buses are not in appropriate condition. During the peak hours individuals are sitting on the roof top of buses and cannot refuse because of little number of buses and lack of public transit facilities.

Throughout these movement jams, black fumes and air pollution are effect on the health of individuals.

The car owners said that they intentionally get off from their jobs, they must go through the pain of traffic congestion.



6.3 Pedestrians

There are no walking ways at the sides of the streets and footpaths are encroach with hawkers and parking of vehicles.

Since the development of sign free corridors becomes challenging for pedestrians for crossing the roads. Furthermore, these scaffolds would not be helpful to any individual particularly for elderly people, ladies children and handicapped.

6.4 Main Road Conditions

Most of the respondents were reported that the main road networks of the central city have encroached with illegally parking facilities near offices, shopping malls, and restaurants, also temporary hawkers encroach the roads, furthermore, most of the shops are extending on footpaths due to which more traffic congestion is creating for the public.

6.5 Road User Safety Problems

The major respondents reported that road safety issues are overcrowded travel buses, different vehicles (minivans and buses, unreasonable vehicle speed, over-burden and expedient cargo trucks, absence of security restraints also the implementation of relevant laws, moreover, absence of active control devices and roadway plan.

6.6 Lack of Traffic Signals and Monitoring Devices

On most road networks in city the main problem there is no active traffic signal system, and no manual traffic police for controlling the traffic and people are managed by themselves due to inadequate functionality of system more traffic congestion and accident are occurred.

6.7 Public Transport and Transit Problems

Many vehicles are age broken brakes, worn tires, and secondary productions, moreover, an absence of legislature project for public transport infrastructure.

6.8 Road Construction and Maintenance

There is no appropriate maintenance of roads and streets in the city on a regular basis caused by an effect on the efficiency of the vehicle. And sub standardized materials are used for the construction of roads due to which roads are not able for long life conditions.

6.9 RESULTS OF INTERVIEWS

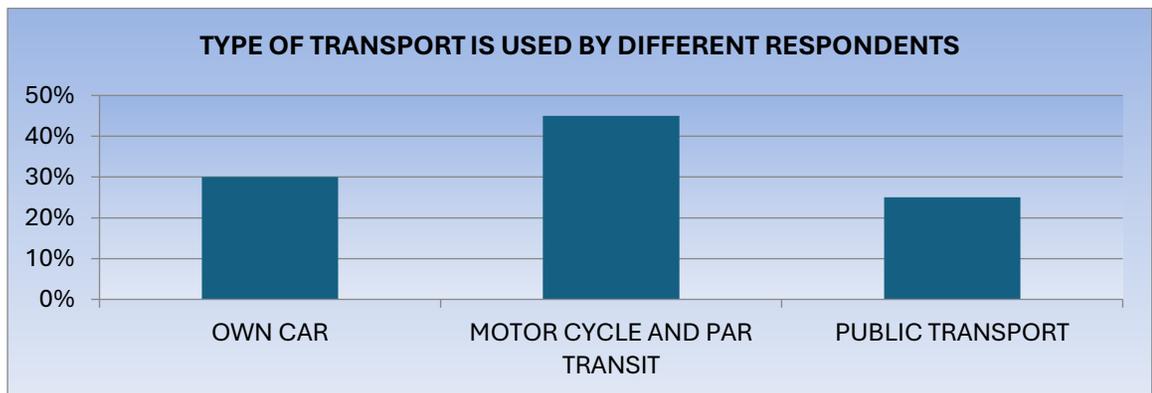


Fig5: Type of transport is used by different respondents.

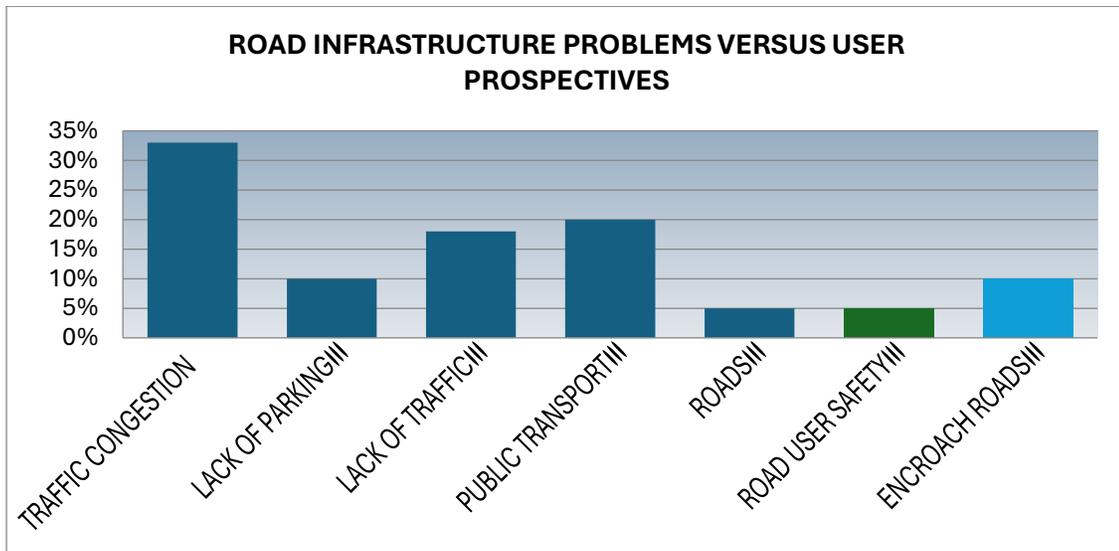


Fig 6: Road infrastructure problems versus user perspective

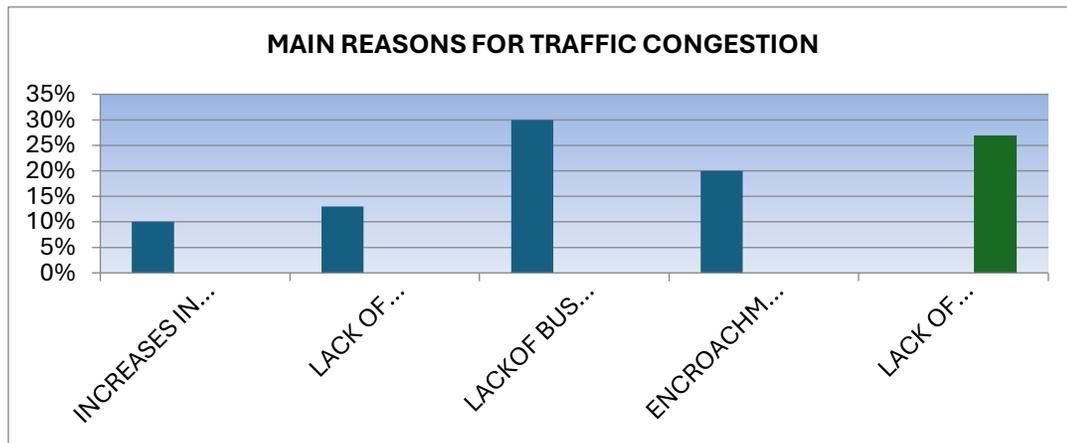
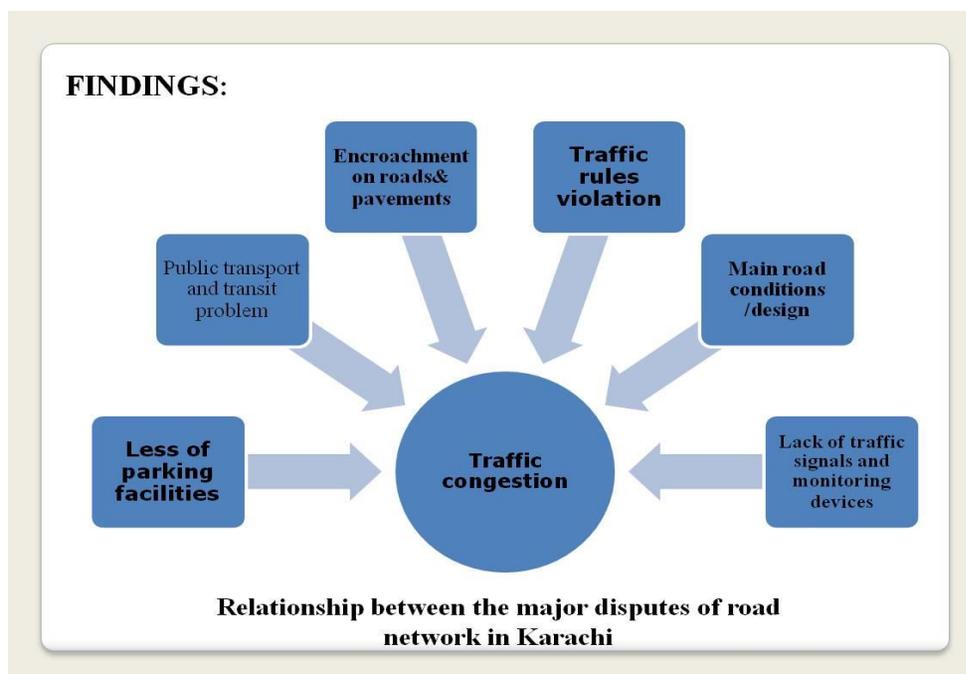


Fig:7 Main reasons for traffic congestion



Traffic congestion is one of the worse problems of the urban city, Karachi, which can be required to resolved on immediate basis with proper traffic management strategies.

CONCLUSION

The conclusion of the study is based on the identification of major road infrastructure problems in urban city Karachi through detailed interviews of different respondents. Most respondents have clearly described the main trouble of road transport for instance lack of traffic signals and monitoring devices, encroachments on the main roads and pavements in addition lack of parking facilities in especially commercial areas of Karachi. Furthermore, lacking an efficient mass transit system in the big city however these problems play a significant role in traffic congestion which can be adversely affected on the environment of the city and created serious problems for the habitats.

The issues depicted in this paper are not limited but can be measured as most of the common. The only way to rectify and cure these concerns is to take charge and implement some stringent rules and regulations, which can only be forced by the government and legal authorities. However, the local public can also take part in educating and practicing these necessary rules which will not only improve our traffic problems but also protect our lives from any major road accident.

Recommendations

- To improve and control traffic in real-time scenarios, we should implement RADAR (Radio Detection and Ranging) Cameras to control the speed of the vehicle. This will not only limit the drivers to exceed the speed limit but also provide safety to travelers.
- Also to ensure the flow of traffic, there must be real-time long-range cameras which can be monitored by the Central Command Control Center where they can take appropriate action on any traffic congestion or incidents.
- To manage the traffic here author suggests an enhanced version of the overall level is the Integration Traffic Simulation.
- Allocation of 'pedestrian provisions' should be budgeted to make walking easier in the City. Within this budget, there should be specific allocation towards safety around schools and markets. Footpaths in the municipality should be scheduled for maintenance or replacement through regular inspection.
- While standard road traffic signs provide routing guidance, dynamic rerouting by road authorities on major interurban corridors is primarily done by Variable Message Signs (VMS), often coordinated according to different scenarios so that a series of coherent messages on different signs can be displayed according to the location and nature of any incident. Broadcasting, websites, text messaging services (SMS) and in-vehicle systems are also important telemetric tools in this respect.
- The registration of cars policy is necessary for the improvement of the country's economy and automatically resolves the problem of traffic congestion.
- The allotted underground area for parking in commercial buildings to solve the encroachment problem on roads.
- To introduce more public transport such as the bus transit system due to which improved the buses condition in the city.
- Traffic control in urban areas principally involves traffic signal management and coordination, congestion reduction, prioritization, and improvements to public transport.
- Traffic congestion on major overland road corridors and in urban areas, the need to improve the balance between different transport modes, and needs to improve safety, and mitigate the impact of transport on the environment.

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