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COMPARATIVE ANALYSIS OF KCR AND BRT: AN EXPLORATORY STUDY COVERING THE MASS TRANSIT NEEDS AND POLICIES IN KARACHI AS A MEGACITY

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Abstract

Karachi, the fastest growing megacity in the world, is a home to more than 22 million dwellers according to the independent sources. Since 1998, its population has increased by more than 100 percent from 11 million. Considering the population framework given by Karachi Strategic Development Plan 2020, the city is expected to have a population of 28.5 million which would exceed 30 million by 2030. The megacity in the developing countries has mega issues including energy, health, sanitation, education system, employment, environment, and transportation. In the last few decades, many developing cities have made huge investments to solve their traffic problems by building mass transit and intelligent traffic systems. One of the most challenging and complicated issues in most of the megacities is the need to provide a mass transit system for commuters and solve the issues related to traffic management. Karachi is the only Megacity in the world with no proper Mass Transit System. This study attempts to make comparison between the Sindh Government Karachi Mass Transit Plan 2030 containing six **Bus Rapid Transit (BRT)** corridors, particularly Green Line, and the revival of **Karachi Circular Railway (KCR)**. The Research Design is based on the secondary, exploratory, and observational data. Sampling and Survey data has been taken from The Karachi Megacity Survey KMCS-2016 and other secondary sources. This study explores the concerns of the commuters in making available the transport solution in the form of Mass Transit System. It, then, evaluates the features and issues related with the BRT and KCR. The study tries to find out the consequences which ultimately will occur as a result of adopting and implementing either of these or both of Mass Transit System in context of Karachi as a megacity. The final part of this study tries to identify the better solution for the masses of Karachi as a sustainable long term transit plan.

Keywords: Megacities, Transportation System, Mass Transit System, Bus Rapid Transit (BRT), Karachi Circular Railway (KCR).

Introduction

Karachi is the seventh largest Megacity in the world. It is often stated as the financial capital of Pakistan which generates 70 percent of revenue for the country. It holds a special place regarding geo-political and geo-economic aspects. 'The City of Lights' is one of the most prime cities of South Asia particularly Pakistan due to being home to spectacular ethnic diversity, languages, religions to sporting two harbours and an international airport. The city is said to have the top most literate people of Pakistan.

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Both educated and uneducated labour finds enormous commercial opportunities in this megacity of Karachi. This Metropolitan, being hub of economic activities, entices large number of people to come dwell in and find bread and butter which include not only the people from within the country but also from the neighbouring and other South Asian countries. The 2005 Earthquake brought huge destruction in the Northern areas of Pakistan causing people to migrate to different cities, particularly Karachi. Also there has been huge influx of Afghan refugees bringing an alarming increase in population exploiting the infrastructure and public amenities.

According to the 2011 Pre-house count, Karachi is a home to 22 million dwellers. Comparing the population of 11 million, according to the 1998 figure, there has been an increase of more than 100 percent. The population framework given by Strategic Development Plan 2020 shows that the city is anticipated to have a populace of 28.5 million exceeding 30 million by 2030.

This fact and the fast urban growth, missing urban planning and weak administrative management have led to give a low-quality life to its inhabitants. Despite being one of the largest metropolitans in the world, the city lags behind in providing ample transport facilities to its citizens. The transport policies have failed to provide an adequate and reliable means of public transport to its commuters. According to a data issued by KMTC, 42% of Karachiites are Public Transport Users for whom only 4.5% public transport is available to cater them. One can imagine the condition of buses, overloaded and proximate to traffic hazards.

Karachi is the only Megacity in the world with no proper Mass Transit System. One of the most challenging and complicated issues in the Megacity of Karachi is the need to provide a Mass Transit System for commuters and address the issues related to traffic management. The traffic congestion problem has come to a very dangerous arena and has already implicit agonizing extent. The rapid vertical growth is adding enormously to the travel and transport demand.

In the last twenty years, many Third World Cities have made huge investments for solving their traffic problems and in building Mass Transit Systems for their commuters. Karachi should benefit from the lessons of the aforesaid investments as the government is in the process of constructing large traffic engineering projects for the city and proposing Mass Transit Systems.

This study attempts to make comparison between the revival of Karachi Circular Railway (KCR) and the Bus Rapid Transit (BRT) corridors, particularly Green Line. An effort has been made to bring to limelight the elements of public transport that have placed a negative impact on the society, the potential characteristics the citizens of Karachi expect to have in a Mass Transit System and the various alternatives available. Comparative analysis responds to a concern for efficiency and a continual quest for rationality in the exercise of decision-making considering the different aspects of possible solutions, same has been tried to suggest in this research study.

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Research Questions

This study will examine the whole spectrum of providing a mass transit policy for the citizens of Karachi by responding to the following questions:

1. Which alternative, Expansion of the current Transit System or the KCR revival, is more likely considered by Karachiites to have a comprehensive Mass Transit System?
2. What aspects of the transportation system should be considered in a Mass Transit Plan for Karachi?
3. Which mass transit policy, either KCR or BRT, has an edge over another in terms of costs and benefits?

Research Objectives

This study has been undertaken with the following intents.

1. To explore the inclination of Karachiites either towards Expansion of the current Transit System or the KCR revival.
2. To bring to light the key features Karachiites as commuters want in the transit plan for the city.
3. To compare the various aspects of both the alternative Mass Transit Policies i.e. KCR and BRT.

Literature Review

Emergence of Megacities

The Asian Development Bank Report defines megacity as a large metropolitan area with a complex economy, a large and highly skilled labour force, and a transportation system capable of maintaining daily communications among all its residents. A threshold population of 10 million is used to define megacities for the determination of a set standard. On an approx., there are 37 megacities globally in 2017. The eight megacities other than Asian megacities are Buenos Aires, Cairo, London, Los Angeles, Mexico City, New York City, Rio de Janeiro, and Sao Paulo. (Asian Development Bank Report, 1996).

The report further elaborates a sharp rise in the number of megacities. Today, Asia has several Megacities-Beijing, Bombay, Calcutta, Jakarta, Osaka, Seoul, Shanghai, Tianjin, Tokyo, Bangkok, Dhaka, Karachi, and Manila. Comparatively, Asian countries and their respective megacities have a greater ratio of urban inhabitants than the developed countries. The Asian megacities have distinctive positive and negative features. They are a source of generating revenue which is more than average, are rich in research and innovation in science and arts, have rich lifestyles full of culture and heritage but on the other hand they face some major lacking in terms of availability of water, health and medical facilities, education, infrastructure, and the like.

The rise in globalization and industrialization of Asian economies, the megacities dwelling in it will grow at an enormous pace playing a significant role in the region's

development. But on the other hand, there are chances of exploitation of land, water, environment and other resources if not utilized and maintained properly.

Table1: Population of Existing and Future Asian Megacities, 1995, 5(million)

City	Country	1995	2010	2025	Growth rate 1995 – 2025
Bangalore	India	4.8	7.3	10.2	2.58
Bangkok	Thailand	9.7	14.0	22.5	2.83
Beijing	China	12.4	17.8	22.3	1.97
Bombay	India	15.1	24.3	33.2	2.66
Calcutta	India	11.7	15.6	21.4	2.03
Dhaka	Bangladesh	7.8	16.0	25.0	3.96
Hyderabad	India	5.3	9.4	13.2	3.08
Jakarta	Indonesia	11.5	19.2	24.9	2.60
Karachi	**Pakistan**	**9.8**	**17.6**	**26.5**	**3.37**
Lahore	Pakistan	5.1	9.1	14.2	3.48
Madras	India	5.9	8.3	11.8	2.34
Manila	Philippines	9.3	13.7	16.5	1.92
New Delhi	India	9.9	15.5	21.6	2.63
Osaka	Japan	10.6	10.6	10.6	0.00
Seoul	Korea	11.6	13.0	13.3	0.45
Shanghai	China	15.1	21.5	26.8	1.93
Shenyang	China	5.3	7.8	10.0	2.13
Tianjin	China	10.7	15.6	19.5	2.02
Tokyo	Japan	26.8	28.7	28.7	0.23
Yangon	Myanmar	3.9	6.3	10.0	3.19

Source: National Institute of Population and Social Security Research

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Karachi as a Megacity

Karachi with a population of above 22 million is the largest city of Pakistan or more precisely is documented as one of the largest megacities in the world. This one of the fastest growing cities is expected to have more than 27 million population by 2020 and more than 30 million by 2030 (JICA, 2010).

The JICA Study reports that in the last few decades, the trade and commerce in this particular region attracted a huge number of people from both within and outside regions of the country. The pressure of population has increased to an alarming extent due to indigenous growth and influxes.

Traveling is primary to any of human activity in order to survive the life. The transportation facilities of Karachi are not extensive, as per demand, reliable and of quality. The JICA Study, 2005 articulates that Karachi generates around 24.2 million person trips on a typical weekday, making around 60% public one. The data gathered by Karachi Mass Transit Cell reveals the shortage of public transport. 42% of Karachiites are public transport users and only 4.5% public transport is available to cater them so one can imagine the condition of buses, overloaded and proximate to traffic hazards. Private cars are 36.5% of total vehicular traffic and they carry only 21% passengers.

The existing public transport system has become a cause of increased mental and physical stress for the commuters along with the transit problems of air and noise pollution. This also creates significant economic and social demerits, a decline in the health and quality of life. These situations forced people to purchase personal vehicles among which motor bikes are increasing around 700 per day makes approx. 4 million motor bikes in the city, which gives birth to a huge traffic management problem itself.

A General Insight into BRT System; Features, Success and Failures

Patel demonstrates in his paper that the bus rapid transit (BRT) systems have been embraced with in numerous Latin American countries and other regions with great success. Curitiba, in Brazil was one of the first in line to have such a transit system. (Patel, 2006)

Reserved tracks are first; supposed to be one of the basic features these buses are meant to have. Second, the buses have wide doors, like a suburban train coach which help passengers to get on and off easily. Third, passengers get boarded from a platform that is level with the floor of the bus. This along with the wide doors; the dwell time is drastically reduced. These are altogether essential components of the total BRT system. The ticket purchases are made before you enter the platform (which, like the bus, is a "ticketed" area, and this further reduces dwell time (Patel, 2006).

The most successful BRT systems have been in the city of Curitiba, Bogota, and Quito according to Mr Patel. He further holds whole-hearted commitment, organizational and institutional frameworks the key to success. The BRT system has much flexibility due to which it is tempting to compromise, and start with a cautious implementation, a sort of step up from an existing bus system.

To get a successful BRT system it has to be introduced and implemented with the same ruthlessness that characterizes a rail system no compromise regarding right-of-way, no question of sharing it with VVIP motorcades or taxis or high-occupancy vehicles says Mr Patel. The BRT system must be a separate, autonomous rapid transit system. It should be made fast, comfortable, and attractive enough to persuade a car owner to use it. It is the car owners who must prefer to leave their cars at home and use the BRT for their routine journeys. If we cannot achieve this set target our cities will be dazed, such as Bangalore, and brought to a traffic disaster by the rapid increase in private vehicle ownership. (Patel, 2006)

Tiwari and Jain are of the view that the CBRT sets forth seven major and basic elements of BRT. These include running ways; stations; vehicles; fare collection; intelligent transportation systems technology; service and operations plan; and branding. (Tiwari & Jain, 2010)

According to the narration in their paper, the success of a BRT project depends on these three factors: institutional structure; concepts related to the operation of buses and integration of the system with other modes of transport to provide easy and safe inter change; and reduction of conflict between different modes (Tiwari; Jain, 2010).

Lindau, Hidalgo and Facchini in their research paper named “Curitiba, the Cradle of Bus Rapid Transit,2010” highlights that Curitiba is the only city in Brazil that has directed its growth by integrating urban transportation, land-use development and environmental preservation. Since 1970s Curitiba's administrators have continually succeeded in bringing innovations with the city's bus-based transit system through performance and capacity improvements. Originally, the bus system evolved from conventional buses in mixed traffic to bus ways, which were later fitted with at-level boarding, prepayment and articulated buses, creating the first full bus rapid transit system in the world. Later, the city familiarized its commuters with high capacity bi-articulated buses and electronic fare ticketing systems. In 2009, the integrated bus system was upgraded, again, with the introduction of the Green Line, its sixth BRT corridor which includes the operation of 100 per cent bio-diesel articulated buses. In 2010, Curitiba retrofitted one of the existing corridors, improving its performance to levels that are typical of metro systems. System operation will be further enhanced with advanced traffic management and user information systems. (Curitiba, the Cradle of Bus Rapid Transit, 2010)

According to the American Public Transport Association BRT infrastructure should cost US $2-18 million/km, the Lahore Metro bus infrastructure capital cost is more expensive as compared to international benchmarks. As per published figures, the infrastructure costs in US$ per Kilometer (all costs escalated to 2014) for BRT for various cities are:

- Ahmedabad, India $3 million/km
- Dalian, China $4.5m/km
- Guangzhou, China $6.5m/km
- Istanbul, Turkey $10m/km

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- Bogota, Columbia (new phase) $13.3m/km
- Lima, Peru $10m/km
- Los Angeles, USA $ 14.4m/km

Considering cheap labour costs in Pakistan and averaging the above figures, a fair approximation for infrastructure costs should be $5-7m/km, says Arif Hasan, the Architect, it is the expensive design and accelerated delivery that may have led to the price escalation.

Once major projects are completed, a "lessons learnt" exercise is normally held so that future projects learn from and improve upon the previous one. The lessons learnt exercise should have included why earlier bus services such as the Lahore Volvo bus and the Pindi Varan bus are no longer running; was it due to a non-sustainable business model, high fuel costs, lack of spare parts and replacement of the fleet, poor governance, or road congestion? Unfortunately, this was not done and the newly started Rs. 50 billion Pindi Metro bus project repeats the same mistakes as the earlier Lahore one, reports Arif Hassan.

A Brief Insight into Karachi Circular Railway

The Karachi Circular Railway (KCR) was made operative in 1964, for the carriage of goods. It was extended to a full circle of 44 kilometers in 1970 to connect the four important work areas of the city (the Port, the Sindh Industrial Trading Estate (SITE), the Central Business District (CBD) and the Landhi Industrial Area). As it also passed through a few dense residential areas, it soon started to serve commuters as well. In the 80s, it operated 24 trains per day for the full circle. The operation from the CBD to the Landhi Industrial Area consisted of80 trips per day. Approximately 6 million passengers used this facility per year. In the mid-80s, the service started to decline because of a lack of maintenance and replacement of rolling stock and maintenance of tracks and stations. By 1998, the KCR was making only 12 trips a day and was losing 6 million Rupees annually. In December 1999, the operation was stopped. Attempts to restart it were made in March 2005. At present, one section from the CBD to the Landhi-Korangi Industrial Area still functions with two trips a day. Apart from the reasons given above, there are other reasons for the failure of the KCR. One is that Karachi expanded well beyond the KCR. As a result, a new network of minibuses and motor rickshaws started serving the commuters which the persons living within reach of the KCR also started to use. There are also allegations that the transport "mafia" also informally pressurized the government not to upgrade the KCR. This was done by developing bus routes that were parallel to the KCR corridor. Also, no attempt was made to integrate the KCR in a larger transport plan for Karachi. Although officialdom abandoned the KCR, civil society has constantly fought for its revival. Mr. Arif Hasan, in his study 'Karachi: The Transport Crisis', states that due to the internal government circle pressure and the pressure from external sides, a revival plan for KCR, the rehabilitation and financing has been developed by the concerned authorities (Karachi: The Transport Crisis, 2015).

The JICA Study: A brief overview

To formulate an urban transportation improvement project with high priority, the Government of Islamic Republic of Pakistan requested the Study for Karachi Transportation Improvement Project to Japan International Cooperation Agency (JICA). The Scope of Work of the Study was agreed between the Provincial Government of Sindh, City District Government of Karachi, and JICA on 7th October 2009. The Joint Venture of Nippon Koei Co., Ltd., Yachiyo Engineering Co., Ltd, and Oriental Consultants Co., Ltd. headed by Minoru Shibuya, was selected as the Study Team.

The problems of urban transport system in Karachi have been reiterated as: traffic congestion, poor road maintenance, many traffic accidents, air pollution from vehicle exhaust gas, overcrowded and uncomfortable bus ride, insufficient and poor bus services, lack of traffic management. The mega size of Karachi, the magnitude of its investment necessities, and the measure of the needs for urban policy and institutional reforms suggest that the challenges of this mega city cannot be addressed in such a manner, traffic chaos by flood in rainy season, and so on (JICA, 2010).

The JICA Study reviewed these problems by the result of traffic survey, site visits, and other existing studies, and summarize as issues to solve the problems, especially focusing on interoperability

The mega size of Karachi, the magnitude of its investment requirements, and the scale of the needs for urban policy and institutional reforms suggest that the challenges of this mega city cannot be addressed with a traditional approach of one-off projects. There is need for a series of appropriately sequenced and assimilated interventions whose collective effect will act as a catalyst to speed up the development process in the mega city. (Karachi Mass Transit Program, 2012)

The crux of the issue can be that the state of present transport system in Karachi is a matter of general inconvenience and disadvantage to the public overall in socio-economic – cum environmental terms with respect to extra time consumption & mental distress.

At the cost of being repetitive, the changes required to put Karachi on a more sustainable development trajectory cannot be achieved through a one-off project intervention. Previous external assistance has been in piece meal and has not been based upon an integrated approach to improve urban transport on a sustainable basis. A set of sequenced reform actions and sector investments are needed to bring about lasting improvements in service delivery.

The proposed Investment Program is intended to address Karachi's development needs through the adoption of a long-term and holistic approach which can (i) build institutions, capacities and systems at the local level to provide effective urban transport & infrastructure system to improve service delivery, (ii) move towards the adoption and implementation of commercial principles in the provision and operation of infrastructure and services, and (iii) support the execution of priority bankable urban infrastructure and

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service subprojects identified and based upon detailed transport sector analysis and prepared in accordance with city plans and sub-sector roadmaps.

The anticipated benefit and impact of the Mass Transit System for Karachi is the initiation of a long-term transport system that will enable Karachi to make even more contribution to national development, while improving the quality of life for Karachiites especially the poor.

The Mass Transit System (Karachi Mass Transit Program, 2012) is expected to:

- Increase commercial and residential development
- Minimize duplication and overlap on public transport routes
- Maximize ridership through an integrated multi-model system
- Offer high service in terms of speed, frequency and easy accessibility
- Reduce car and motorcycle dependency
- Provide safe, secure, environmentally sustainable, reliable and dependable transport that meets the needs and aspirations of the mega city.
- Link the CBD with the town centers and peripheral areas of Karachi.
- Relief from psychological pressure

The priority Mass transit Projects proposed by JICA study team in the Karachi Urban Transport Master Plan Report of Karachi Transport Improvement Project are given below (Karachi Mass Transit Program, 2012).

Circular Railway

- KCR (43.1km) and Extension (14.5 km)

Railway (Elevated LRT)

- Blue Line (Superhighway- Tower): 22.4km
- Brown Line (Nagan Chowk - Landhi): 18.5km

BRT (Surface)

- Green Line (Surjani to Saddar)
- Red Line (Safoora to Saddar)
- Yellow Line (Korangi Industrial Area to Saddar/ Numaish)
- Aqua Line (Hawks Bay to Gulbai)
- Purple Line (Baldia to Shershah)
- Orange Line (Orangi Town to Board Office)

Research Methodology

This research analyses the cause, extent and technique which have been used in developed and developing countries in terms of providing BRT system as a transport solution. This has been done in order to see the trend and experiences which can be of

guide particularly for Karachi for the measures being taken and to be taken. In this way, we could get to know better as to how transport solution can be provided to the Karachiites.

The way of the study is exploratory and judgmental which expects to determine reasons, degree and answers for transport problems in Pakistan. The quantitative research design is adopted in order to apply judgmental and meaningful techniques and the Karachi Megacity Survey 2016[1] data was used for this purpose.

Qualitative pattern is utilized for gathering immaculate and inward perspectives of the people who commute via public transport in the city. Explanation behind embracing judgmental and meaningful design is because of considering respondents holding diverse educational fields to address this issue in a scholastically illustrative way. Two arrangements of polls were intended to gather data. Interviews, individual communication, observations and additionally web; telephonic devices were likewise used for encouraging non-respondents to the surveys.

The data, both from survey and reviews, has been analysed with the intent of extracting useful information for making recommendations, and coming up with effective conclusions. In this research, we analysed the data by way of longitudinal and transversal study. Statistical tools were used for analysing the qualitative and quantitative data. SPSS techniques were applied for having a clearer picture of the results. From the survey data, patterns were drawn out of the concepts and insights which will bring about a better understanding for the reader in reading the research.

[1] https://cssr.gmu.edu/research-projects/university-of-karachi-partnership/megacities2016-karachimegacitiesdata

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Analysis and Findings

Phase 1: Revival of KCR or the Expansion of the current transport system; a preferential analysis

Table 2: HH13- Main mode of transport usually used to commute by the Household member * T41-Are you in favour of reviving the Karachi Circular Railway? Cross-tabulation

		T41-Are you in favour of reviving the Karachi Circular Railway?			
		Yes	No	Don't Know	Total
HH13- Main mode of transport usually used to commute by the Household member	Stay at Home	9.0%	0.9%	2.9%	12.7%
	Personal Car	9.2%	1.6%	1.8%	12.5%
	Motor Cycle	24.2%	2.2%	4.8%	31.2%
	Taxi	0.8%	0.0%	0.2%	1.0%
	Rickshaw	8.0%	0.6%	2.3%	10.8%
	Mini Van	2.0%	0.2%	0.5%	2.7%
	Bus	21.5%	2.3%	4.0%	27.8%
	On foot	1.0%	0.0%	0.2%	1.2%
Total		75.7%	7.6%	16.6%	100.0%

The modes of transport have been selected as the independent variable and the opinion in favour or against the revival of the KCR as the dependent variable. It is observed in the Karachi city that the citizens, as commuters, are in favour of the KCR revival which has been tested through cross tabulation by using the mentioned variables.

Table 3: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.042a	14	0.000
Likelihood Ratio	72.472	14	0.000
Linear-by-Linear Association	8.131	1	0.004
N of Valid Cases	5898		

a. 1 cells (4.2%) have expected count less than 5. The minimum expected count is 4.50.

The relationship between the variables selected may or may not exist and vary from case to case. To analyse the relationship between the mode of transport used by the commuters of Karachi and the revival of KCR, Chi-Square test has been used. The result indicates existence of a significant relationship between the two ($p<0.05$).

75.7% of the total commuters are of the opinion that the Karachi Circular Railway should be revived as a permanent and comprehensive mass transit system. This shows that the majority of Karachiites look toward KCR as the mass transit which they can shift and rely on.

The major congestion on road is due to motorcycles and personal cars which make up the 43.7% of the total transport users in the sample data. Out of this 43.70%, 33.4% straight away responded positively for the revival of the Karachi Circular Railway. This shows a major inclination towards the usage of KCR as mass transit system if restored for the citizens which will help reduce the road congestion to a momentous level.

Any mass transit system to be successful should attract at least 20% of the total commuters. In this case the Karachi Circular Railway has greater probability to do well in appealing the commuters to use the public transport instead of their private vehicles, be it motorcycles or cars which will help reduce traffic on the roads and lessen the traffic jams.

Upon asking about the expansion of the current transport system, 15.20% replied in favour out of the same 43.70% making up the motorcycle and personal car users which is illustrated in the table.

Table 4: HH13- Main mode of transport usually used to commute by the Household member * T46-In considering Transportation Plan for Karachi how important is: Expansion of Current System Cross-tabulation

		T46-In considering Transportation Plan for Karachi how important is: Expansion of Current System					
		Least Important	Somewhat Important	Very Important	Most Important	Don't Know	Total
HH13- Main mode of transport usually used to commute by the Household member	Stay at Home	0.9%	3.2%	1.8%	2.5%	4.3%	12.7%
	Personal Car	1.3%	4.3%	2.1%	1.4%	3.4%	12.5%
	Motor Cycle	2.1%	10.3%	5.3%	6.4%	7.0%	31.2%
	Taxi	0.1%	0.3%	0.1%	0.1%	0.4%	1.0%
	Rickshaw	0.8%	2.6%	1.8%	1.2%	4.5%	10.8%
	Mini Van	0.2%	0.6%	0.3%	0.6%	1.0%	2.7%
	Bus	2.8%	9.2%	3.0%	3.2%	9.6%	27.8%
	On foot	0.0%	0.1%	0.5%	0.4%	0.3%	1.2%
Total		8.2%	30.6%	15.0%	15.9%	30.4%	100.0%

Analysis in the given table 5 reveals that both the variables are, here too, not independent, and that much dependence is observed between the transport the commuters used and the inclination towards the expansion or non-expansion of the current transport system ($p<0.05$).

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Table 5: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	297.772[a]	28	0.000
Likelihood Ratio	301.499	28	0.000
Linear-by-Linear Association	1.587	1	0.208
N of Valid Cases	5898		

a. 1 cells (2.5%) have expected count less than 5. The minimum expected count is 4.85.

Comparing the responses for the revival of KCR and the expansion of the current public transport system, 33.40% for KCR against 15.20% for expansion and maintenance of the current system, major inclination observed is in the favour of Karachi Circular Railway.

Phase 2: Features of a Mass Transit Plan

One of the objectives of this study is to bring to light the characteristics of the public transit plan which the citizens of the Karachi who use public transport give preference and considers important. The aspects of the transportation system which have been asked about and analysed in the study are listed below.

- Physical condition of road network
- Maintenance of the existing system
- Expansion of the current public transport system
- Improvement of bicycle network
- Improved footpath for pedestrians
- Reduction in travel time
- Improvement in Traffic Safety Programs
- Improvement in Driver Licensing Program
- Improvement in quality of Cars
- Improvement in quality of Public Buses
- Establishment of Vehicle Inspection System for Public Transport
- Safety Awareness Program for Motorcyclist
- Improvement in Pedestrian Bridges

For the above-mentioned features, the responses analysed are of 53% respondents while the remaining 47% remained unavailable or didn’t reply to the questions asked.

Following findings were made after analyses of the responses,

Physical Condition of Road Network

Considering Transportation Plan for Karachi, the Physical condition of road network is one of the major aspects to be considered. The roads are the backbone of any transport system and of the economy. Karachi is the largest city of Pakistan and one of the megacities of the world. The physical condition of the road is going from bad to worst. It has reached an alarming stage and needs to be checked at once

The responses in the chart depict a major inclination towards the improvement and construction of a sound road network.

Maintenance and Expansion of the Existing Public Transport System

The maintenance and expansion of the current public transport system is significant. The transport system needs to be integrated which has a substantial relation with the efficient working. Chart 2 depicts the responses for the maintenance and chart 3 depicts the responses for the expansion.

Both the charts illustrate the perception of the Karachiites for the current transport system. People are not satisfied with the functioning of the existing system. They are of the view that it has to be improved. 30 percent of the respondents remained caught up whether the prevailing system can be utilized well if maintained or expanded, which is something truly needs to be considered.

Improvement of Bicycle Network

Despite being one of the most modern and biggest cities, the society of the Karachi city is not receptive to bicycle riding and doesn't consider it to be important.

37 percent of the respondents, upon asking, considered the maintenance and improvement of the bicycle network to be least important which shows that the bicycle cannot be a major part of transport plan although it will add to the physical fitness, fuel efficiency, environment friendly and reduce transport congestion.

Improved Footpath for Pedestrians

Footpaths for Pedestrians play a major role in reducing accident ratio, easing the access to public transport, and making people comfortable to walk on foot to nearby places. This leads to reduction in use of private vehicles and leads to a drop in traffic congestion.

The citizens of Karachi face a lot of trouble due to absence of good construction footpaths. A major percentage of the commuters are affected adversely hence this needs to be checked positively at the earliest.

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The chart shows that improved footpath for pedestrians is of much significance considering Transportation Plan for Karachi. 30 percent of the respondents considered the improvement of footpaths for pedestrians to be 'most important'. The results depict that the footpaths are to be improved on priority basis.

Reduction in Travel Time

In view of the Transport Strategy for the megacity of Karachi, the reduction in Travel time is of foremost concern.

Karachi is the hub of economic events. Since this city is the centre of commercial and business activities therefore the traveling has to be efficient and effective in order to increase the revenue generation capacity ratio for the national economy.

The respondents are of the opinion that the mobility of the goods and the travel time for commuters should be reduced by way of introducing and implementing a transportation strategy which is well-organized, integrated, economical and effectual.

Out of the valid responses received, 32% ranked the reduction in travel time to be the most important and 35% to be vry important which makes up a significantly major fraction.

Traffic Safety Program

Considering Transportation Plan for Karachi, the Improvement in Traffic Safety Program should without a doubt be on top priority. These kinds of programs ensure safe and sound travel for the citizens as commuters and help reduce traffic hazards for the drivers, passengers and pedestrians.

The respondents responded in favour upon asking about the need to properly design, implement, and execute traffic safety programs.

Out of the 64 percent of the total respondents which make up a significantly good proportion, 34% ranked the traffic safety programs as the 'most important' and 34% ranked as 'very important'.

Driver Licensing Program

The megacity of Karachi lacks a safe and sound mass transit system. Be it a private transport driver or a public transport driver, the driving method is not secure or harmless.

There are a large number of drivers who are not eligible for driving and don't even have a driving license. Under age people also drive recklessly on the road.

In vision of a Transportation Plan for Karachi, there is a dire need of an ample and comprehensive Driver Licensing Program. The inclination of the need to improve such licensing programs can be clearly seen through the responses on the chart.

Quality of Cars and Public buses

The quality of vehicles has a lot to do with the flow of traffic on the roads. The type of cars running on the roads of Pakistan particularly Karachi city is not up to date. Downgraded and rotten vehicles from other countries and regions are being used in the megacity of Karachi. The public buses are in their worst condition but still are overcrowded with passengers even on the roof top. This makes the condition even horrible.

Vehicle Inspection System

In view of the transport plan for Karachi, there has to be a properly established vehicle inspection system especially for public transport. This will help ensure safe and smooth traffic flow all over this megacity of Karachi.

Majority of the respondents are of the view that the government should work on this aspect of the transport strategy as illustrated in the chart. Only 9% ranked it to be least important which shows that only a small proportion of the sample size consider it to be less value.

Safety Awareness Program for Motorcyclist

Motorcyclists form a huge proportion of the total commuters in the city. Majority of them neither follow any driving ethics nor do they attend any safety awareness programs. This leads to major traffic hazards. Safety Awareness Program for Motorcyclist

Considering Transportation Plan for Karachi, Safety Awareness Program for Motorcyclist is of utmost value. 29% respondents ranked such programs to be ‘most important’ and 29% ranked it to be ‘very important’.

should be planned in a proper and timely manner and the execution should then be assured in a systematic approach.

This shows that people have concern for such issues but non availability leads to traffic issues which have now become permanent part of the travelling in Karachi city.

The current pedestrian bridges are not sufficient in number and are also not in such condition which could add to the comfort of the pedestrians. They need to be properly constructed.

Pedestrian Bridges

Pedestrian bridges are of primary concern in any transport plan. The society in which Karachiites live consists of many people who walk on foot, take lifts, and use public transport and the like. Pedestrian bridges are something which people look for as a facility which is their basic and obvious right to have in their city.

35% respondents talked about the improvement in construction and design of the pedestrian bridges as one of the most important elements of the Karachi Transport Plan.

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KCR vs. BRT: An Evaluation

Strategic Planning

In terms of long-term sustainable planning, the kind of BRT System that is being implemented in Karachi today and the citizens of Karachi are supposed to have is not a sound and complete plan. This is, in fact, a part of the master plan proposed by JICA study. Thus, there can be some serious implications as adopting part of a whole without making it complete in itself is not a good deal in terms of strategic and long-term sustainable planning. On the other side the KCR, since its inception, has always been a complete plan that once was very profitable and worthy transit system for the commuters of the Karachi city. It used to cater a huge amount of population and used to be a sound mass transit system initially meant for goods transportation only.

Here, it is also worth mentioning that The Green Line was to meet the Blue Line at Gurumandir and then go on to Tower in the Master Plan but because work was delayed on the Blue Line, the policy makers announced the Green Line to be extended to the central business district at the time of inauguration ceremony as reported by Dawn.

This is also point of question that is why the policies are not made with a strategic vision and why the policy makers have to go to make emergency amendments. These are some serious concerns with the BRT system.

Beneficiary Percentage

Since providing mass transit system is a public expenditure and a responsibility of government so public welfare needs to be optimized. Social welfare must be the priority.

The Karachi Circular Railway, if repaired and run, would manage 30% commuters of KHI reducing road congestion against 3% by BRTs as reported by Daily Times. The building of Karachi Circular Railway is expected to mitigate sufferings of millions of commuters in the port city, which has a huge demand for urban transport says a newspaper agency.

We also need to consider seriously the rapid vertical growth happening in Karachi which will add enormously to the future needs and demand of the megacity of Karachi. The question on the life of the buses remains in its place.

Integrity within a system

Any Mass Transit System introduced, to be successful, is to be integrated with existing transport system so that they complement each other because we live in a developing country and here we cannot demolish fully one system and adopt the innovation policy. We need to follow what you can say ‘Kaizen’.

One point of question lies in the fact that the BRTs are being developed under various authorities who will be funding the projects accordingly. So the major

apprehension is about the final product of BRT. All BRTs should have same features and facilities to provide to the public at same rates. You can't have a coin-operated system in one line and a card system on another. In case of KCR being one full project, there lie no such issues of integration.

Incorporation with existing Public Transport System

The current Public Transport System has been designed in a fairly good manner. It should be integrated with any mass transit policy which policy makers come up with for the commuters of Karachi. The design of the BRTs needs to be moulded in a way that it utilizes, after maintenance, all the public transport currently available for use.

Feeder Services and Parking Zones

The design of BRT System being implemented in the megacity of Karachi doesn't assimilate local traffic and the mass transit. The public who wants to come from beyond the 500-metre catchment area will have to face trouble. The architects are of the view that there should be added park-and-ride component to the project around the bus stations so people could leave their private vehicles and use the BRT. In case of KCR there is an integration of feeder routes and existing buses if maintained and managed properly can complement quite well.

Considering Lahore BRT only a minor percentage of the citizens use it and there has been no significant change in the traffic. Same goes with the Islamabad case. Any mass transit system to be successful, there should be such designed structure and facilities that encourage them to use it.

Road Services and Recent Influx of Motorcycles

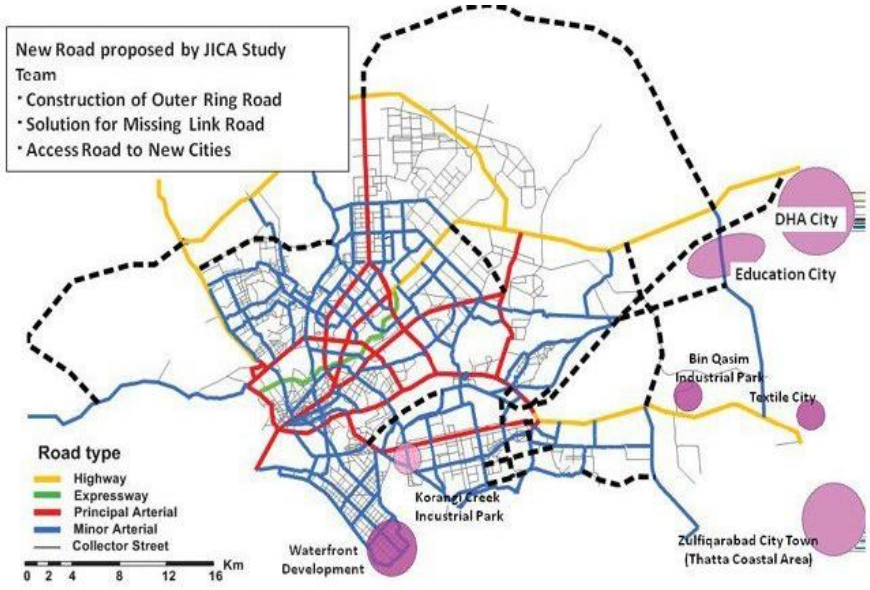
Road network are the backbone of infrastructure of any country. Road development policies should be taken into consideration seriously because the condition is alarming. During the last decade there has been a huge influx of motorcycles. The Nooriabad industrial zone, Korangi industrial zone all these are now having industries that are providing bulk of motorcycles at cheaper rates. Previously, there were only few brands but now there are many. This has added enormously to the total vehicular traffic.

Connectivity with new Industrial Zones and Education Cities

In terms of integration, we also need to connect the new industrial zones and cities that are being built in Karachi. The population trend in these areas is also to be increased rapidly in coming years. This will add enormously to the transit demand. With BRT there seems no such thing in plans. On the other hand, as reported by Express, KCR will connect industrial zones of the city creating employment opportunities ultimately improving living standard as illustrated in the following map.

Note: This JICA map was courtesy Environmental Management Consultants Managing Consultant Syed Nadeem Arif

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Source: https://tribune.com.pk/story/124800/in-a-city-where-40-people-fight-for-1-seat-mass-transit-is-the-solution/

Environmental Factors

The BRT System has energy efficient engines which are environment friendly. The buses which are being used in Lahore and Islamabad Metro are fitted with energy efficient Euro II engines. However, the fuel these vehicles run on is still not of European standards so the buses will not be eco-friendly. Same will be the case with Karachi BRT system.

As reported by Express News, on the routes of the Green Line Bus Rapid Transit scheme 16,637 trees will be wiped out to construct the pathway. This will add dangerously to climatic changes which Karachiites are already facing, the heat wave is just one example.

Encroachment Issue with KCR Routes

With KCR two issues are always raised. One is of Finance and the other of Encroachment. Encroachment issue is not of that extreme as it is being portrayed. The government has to clear only 20% of the area around the Karachi Circular Railway (KCR) lines. Ministry of Railways had allocated 250 acres of land to shift all encroachments and relocate the displaced people as reported by Business Recorder.

The government had previously formed an Anti-encroachment Task Force AETF. In the areas nearby Juma Goth demolition of encroachments was in progress and other areas were also being granted to serve for this purpose.

Conclusions and Policy Recommendations

The research study can be concluded with furnishing a few important recommendations to bring into notice of the policy makers; the need to consider some major aspects of the transit policies. This will also prevent adopting any inefficient and ineffective Mass Transit System for the megacity of Karachi.

Considering the responses, the commuters of the Karachi city look towards KCR as a major solution to the transportation woes. The framework, cost and benefits analysis and the feasibility of future demand shows that there has to be a transit system which is designed strategically. The life of the vehicles and infrastructure of the Mass Transit System should be such that it caters not only the present but also the future transit needs. Besides, it should also be eco-friendly. Considering all these features, KCR is a better alternative.

As Karachi is the megacity of a developing country, the policymakers, and the authorities responsible should keep in their plans the need to adopt Kaizen strategy. One cannot shift entirely on a new transit system. For any transit system to be successful in Karachi there has to be integration both with the current transport system and with the areas expected to have more travel demand in future. The BRT system which is being currently implemented lacks integration from both the aspects which KCR can cater if revived for the commuters.

Improved physical condition of road network, footpath and pedestrian bridges should be ensured at the earliest. Maintenance and expansion of the existing system along with integrating it with the new transit systems being adopted are some of the key findings of the analysis of the responses. Traffic Safety Programs, Driver Licensing Program, and Vehicle Inspection System are the key components which the citizens of Karachi look into the transport policy for their city.

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Annexure

Chart 1: Physical Condition of Road Network

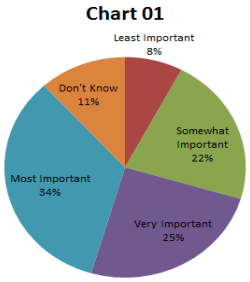


Chart 2: Maintenance of Existing Transport System

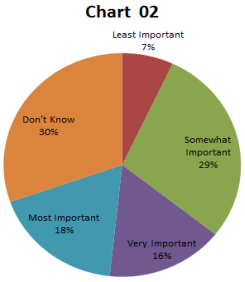


Chart 3: Expansion for Existing Transport System

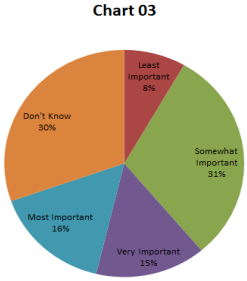


Chart 4: Improvement of Bicycle Network

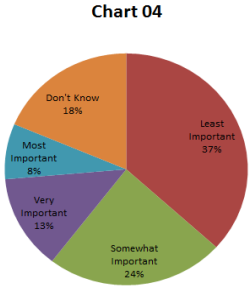


Chart 5: Improved Footpath for Pedestrians

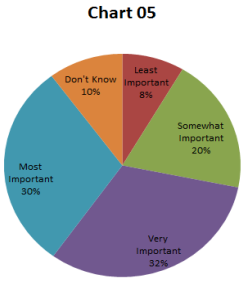
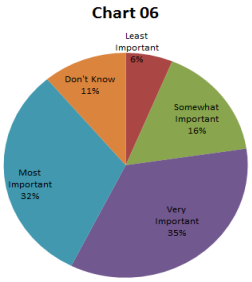


Chart 6: Reduction in Travel Time



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Chart 7: Traffic Safety Programs

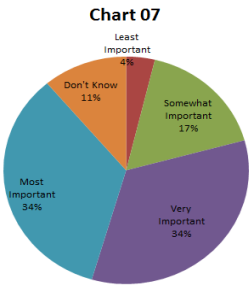


Chart 8: Driver Licensing Program

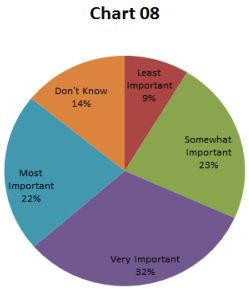


Chart 9: Improvement Needed in Cars Quality

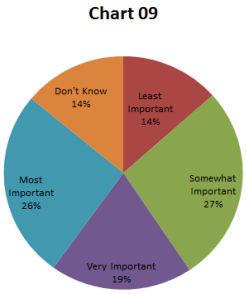


Chart 10: Improvement Needed in Bus Quality

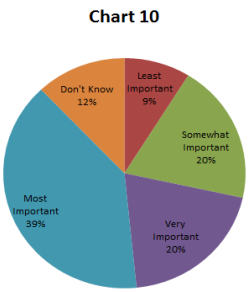


Chart 11: Vehicle Inspection System

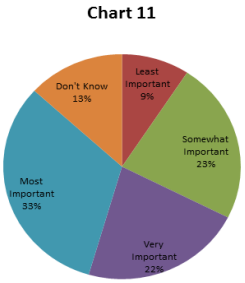


Chart 12: Safety Awareness Programs

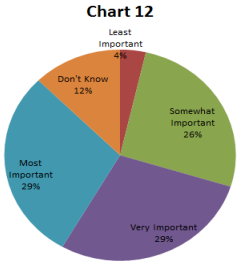


Chart 13: Pedestrian Bridges

