



Evaluating Public and Private Transport of Lahore

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ABSTRACT

Increase in population is a dominant problem that is taking place throughout the whole world and its main cause is rapid urbanizations. Urbanized growth, consequently, has led to a higher number of motorized vehicles, because of which there has been a considerable increase in the number of traffic volume in the recent years. The existing road capacity and level of service does not fully cater the present traffic and transportation needs of commuters. Urban transportation concerns are hampering the growth of sustainable transportation system across the country. Along with the provision of fixed route service, an integrated transit system with this service is the need of a community. The design of the research includes the selection of case study area that is Lahore. The systemized means that has been adopted for accomplishing the objectives of the study conducted include topic selection, comprehensive literature review in context of local along with international scenario, data collection which includes both primary and secondary, data analysis using Excel and SPSS software, data interpretation and laying down suitable proposals. Report writing is being carried out side by side with all other tasks. The major outcomes of the study is by improving the security of public transport and management of public transport the preference of people to use public transport will increase. Also the cleanliness and level of service of public transport will improve then the preference to use public transport will increase. The solution that research recommended for Lahore city is one that has been locally designed to meet the majority's problems, as the solution should be low-cost, environmentally sustainable, and responsive to the social demands of the local people.



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INTRODUCTION

Transport and mobility are the two constituents of cities which need to be planned in a sustainable manner. Urbanized growth, consequently, has led to a higher number of motorized vehicles, because of which there has been a considerable increase in the number of traffic volume in the recent years. The existing road capacity and level of service does not fully cater the present traffic and transportation needs of commuters. Urban transportation concerns are hampering the growth of sustainable transportation system across the country. Along with the provision of fixed route service, an integrated transit system with this service is the need of a community.

The failure of public transportation to encourage carpooling has led to a decline in transit use and an increase in car ownership in urban areas. The need for public transportation in Lahore, the country's second-largest metropolis, has been met with the construction of Bus Rapid Transit. However, the inability of this mass rapid transit to cope up the travel demand and to ensure a demand-responsive service has led to increased motorization. What is more important is the provision of a door to door service, well synchronized with the fixed route network. Presently, the informal private transport and para-transit modes are hampering the flexibility of public transport and are incapable of carrying large number of passengers, with increased travel cost, an inefficient traffic-transportation network and unsustainable mobility.

Lahore being the provincial capital of Punjab is a populous city, having a population of more than 9 million. The growing population has led to an increased transportation demand which amounts to around 13.5 million daily multi-purposed motorized trips other than walking. With a population predicted to raise to over 15 Million by 2015 and with this the travel demand is expected to rise which would stimulate the growth of private cars and a higher Para-transit dependency.

This research is design to highlight people perception and satisfaction regarding public transport in Lahore. There is an increased passenger flow, traffic congestion. There is need for intervention to improve traffic congestion in some areas of Lahore with the provision of a decent yet reliable mode of travel. Although, the area links to BRT route but does not provide efficient accessibility to it. The use of public transport has become minimal because of the low quality service being provided with increased travel time and high fare structure. However, where Bus rapid Transit is gaining ridership, people using the service have limited access to this fixed transit service.

Alleviating traffic congestion in the area with the deployment of a efficient and identifying all those key indicators which will help access and deduce the need of such a service, ensuring a decent travel, an efficient traffic-transportation network and a sustainable mobility.

The feasibility of introducing such a service is thus checked. Moreover, willingness of people to shift from inefficient para-transit public transport modes is brought into consideration. Replacing the existing public transport modes with decent transport, would thus ensure a decent passenger service which would help people shift from other unreliable travel modes. The study mainly focuses on minimizing congestion and providing people with a decent mode of travel. Thus the replacement of existing para transit modes i.e. auto and qinqui rickshaws and the provision of a decent passenger service will provide people with a reliable travel option with a quality service. It will, then reduce traffic congestion and will lead towards a sustainable traffic-transportation

network. This study includes the following objectives. To review the existing literature regarding sustainable urban transport and its implementation throughout the world, to study the residents perception regarding availability of public transport, to detect the factors responsible for sustainable transport in Lahore city. And to highlight the possible remedies for improved and reliable urban transport service in Lahore.

METHODOLOGY

This study discusses the statistical analysis technique used to interpret the data. According to Shampoo and Resnik (2003) various analytic procedures “provide a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data”. Questionnaires have been made to address the research questions. This have been designed to evaluate the travel pattern of residents of Lahore on the bases of their preference to travel on either public or private mood of transport .open ended and close ended questions included to describes the various indicators of the travelers related to their preferred mood to travel .major indicator that have been used in the questionnaire are security, affordability, level of services, management, congestion and efficiency etc. The questionnaire showing the satisfaction level regarding to their preferred transport also included that also show their travel pattern.

Every study is based on some research technique and methods. This research study includes the different techniques for the evaluation of the mainly root causes and also identification o potential impact and devices the ways to reduce the marvel. For this purpose, we have performed the regression analysis.

RESULTS

The vehicles used for public transportation are multi-occupant vehicles. Different modes of transportation have different schedules due to the fact that they only pass certain routes at certain times of the day. This mode of transportation is usually operated by the city, and its only benefit is that it is inexpensive and charges the same fare for everyone. Unfortunately, they tend to be overcrowded and stuffy, especially in the warmer months. In addition, motorists will not wait for late passengers, and buses frequently continue on their routes even if they are completely full. Rickshaws and taxis, bus services, and metro trains are the mainstays of Lahore's public transportation system.

You won't have to split the cost of the ride with anyone else on a private transfer, unlike public transportation. It's just you, the driver, and your closest companions or business associates. The term "private transport" refers to modes of travel that are not open to the general public, and which can be reserved for exclusive use by a single passenger. In today's society, the automobile has surpassed all other private modes of transportation in terms of popularity, and this is largely due to people's preference for not using public transportation.

Public Opinion regarding Public and Private Transport

There has been a long-standing debate about the relative sustainability of private and public modes of transportation. Use of public transportation has been shown to reduce emissions of atmospheric pollutants from the transportation sector, and many studies have found that reliance on private automobiles is the primary cause of these emissions. However, population density is

crucial to the financial viability of public transportation. In terms of population and urbanisation, Pakistan leads South Asia.

Urban land use and the transportation system, for example, have been revitalised by Pakistan's rapid urbanisation and automobile use, despite being socially, economically, and environmentally unsustainable. Lahore, with its 11.13 million residents, is Pakistan's second-largest metropolis (2017). There is an annual growth rate of 3.5%, according to census data. A well-coordinated system of public transportation is required to navigate this massive population.

Many people believe they lack access to public transportation because of this. The stations for the metro bus and the orange line are too far from their homes, and thus they refuse to use them. Women have voiced their displeasure with a policy implemented by the government that gives men preferential treatment when it comes to reserving seats. It could be a contributing factor to the relatively low number of women in the field.

The cost savings from taking the bus or train instead of driving your own car to work can be as much as four times higher. Parking fees, emission tickets, and speeding fines are just some of the hidden costs that come with driving your own car on a regular basis. If you take public transportation, you won't have to worry about paying for parking, gas, insurance, maintenance, or anything else associated with driving. Regular bus riders are more likely to have favourable views of the service and to perceive fewer obstacles to riding the bus than non-riders. Users who rely on the bus on a regular basis are more likely to have a positive outlook on the industry as a whole. Buses have a very negative reputation among those who either never use them or last rode one quite some time ago. This may have occurred because of a lack of factual knowledge or information about the accessibility of bus routes. Thus, it appears necessary to alter unfavourable perceptions of the bus while also requiring bus companies to implement solutions to remove obstacles to ridership.

When getting around the city was a hassle before the Metro Bus Service, many residents opted for motorbikes. They avoided regular buses due to the inconvenient and unreliable service they provided. Furthermore, they can't afford the expensive Daewoo, the Lahore area's preferred mode of public transportation. A bus trip allows for social interaction, while the confines of a car make it difficult to talk to strangers. Travelers in cars may experience anxiety if they view driving as a stressful occupation. However, there are motorists who form strong emotional attachments to their vehicles. Certain motorists have an extreme bias against using public transportation and demonstrate an almost pathological need for their personal vehicle.

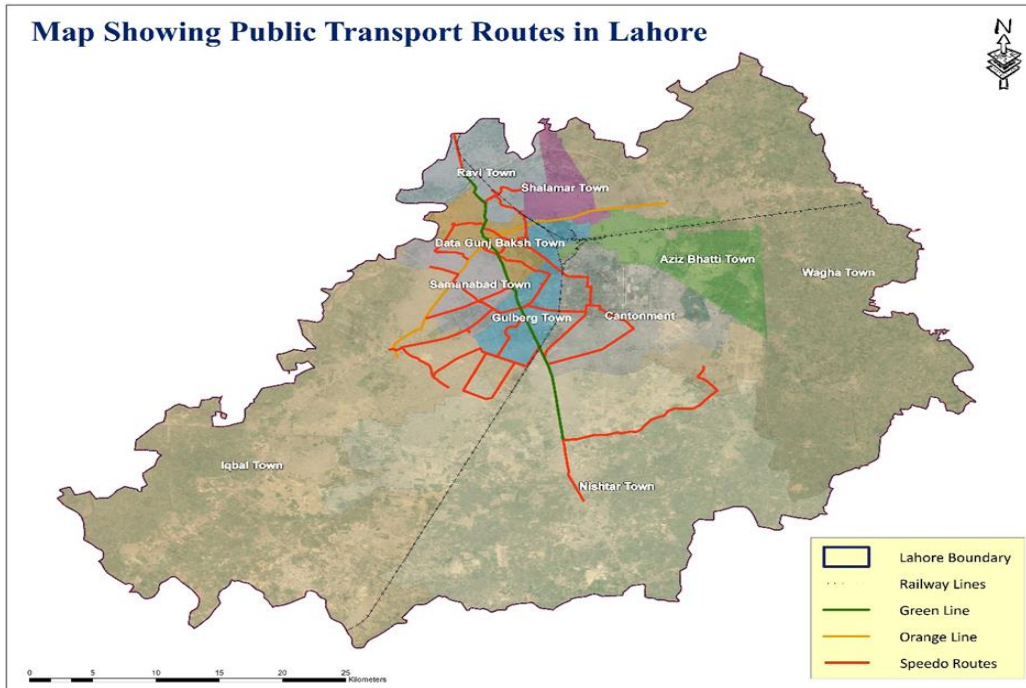


FIG 1: Existing Map Showing Public Transport Route in Lahore

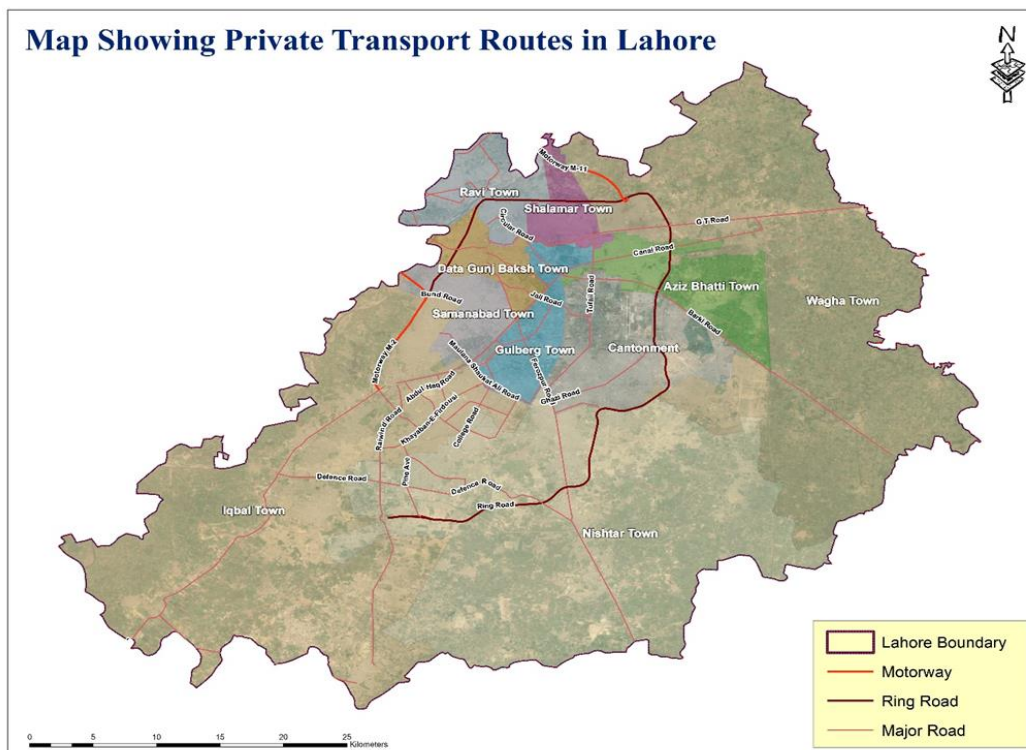


FIG 2: Existing Map Showing private Transport Route in Lahore

ANALYSIS OF RESPONDENTS VIEWS IN CONCERNED CASE STUDY AREA:

The data was collected from the residents and officials of the concerned Case Study Area and the data without Analysis is of no Use and Cannot make sense if not presented Visually because the visual representation develop clear understanding about the situation. The responses recorded from the Respondents are following.

Public transportation and respondents view at concerned case study area.

Preference of Public Transport over Private Transport

This response helps to indicate the preference of people in regard to choose public transport in their respective case study areas. It represents that about 118.25% respondents wants public transport as the consider private transport is considerably expensive one.

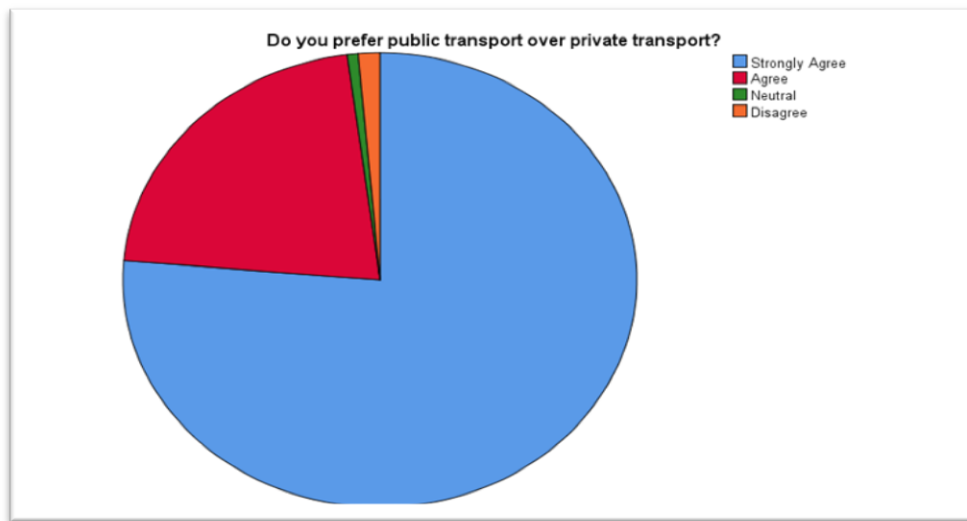


Figure 3

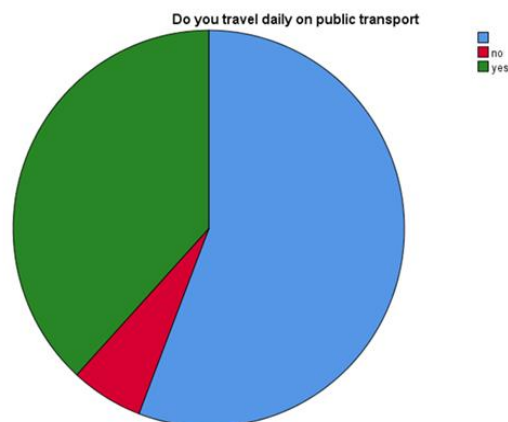


Figure 4

The above response shows that most of the people travel on public transport that 115.28% respondent travel on public transport while 30% respondent said that they don't travel on public transport.

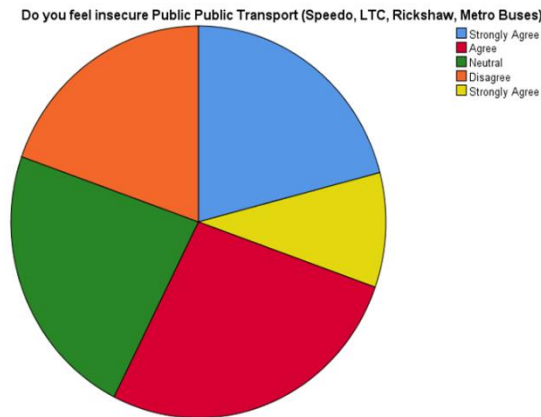


FIG 5: *Is public transport safe/Insecure*

The above responses show that maximum 43% people considered that the public transport terminals are unsafe and they feel insecure at there. about minimum 11.2% people feel that public transport terminals are insecure.

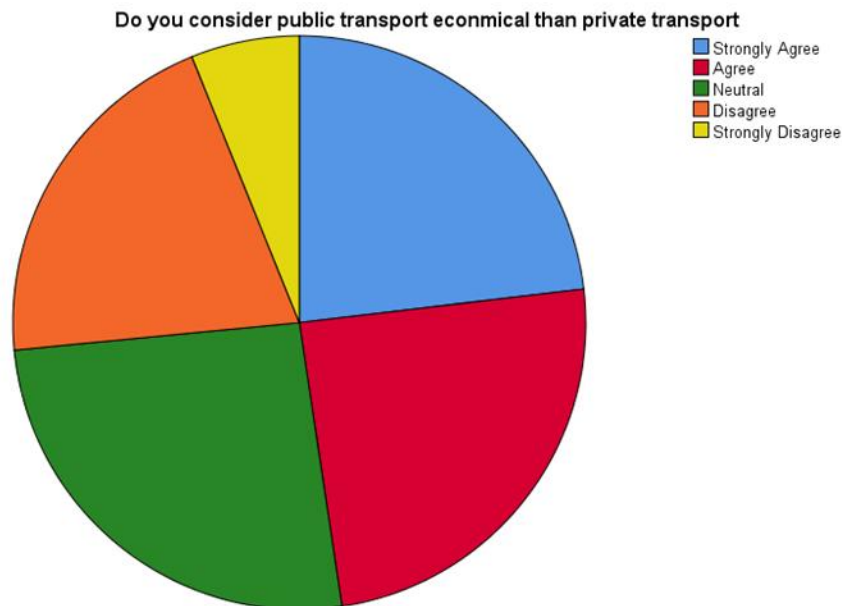


FIG 6: *Is public Transport Economical /Not Economical*

The graph indicates that 40% of people contemplate that public transport is affordable as it is economical as compared to private transport .as the cost to travel on private transport is greater than public transport

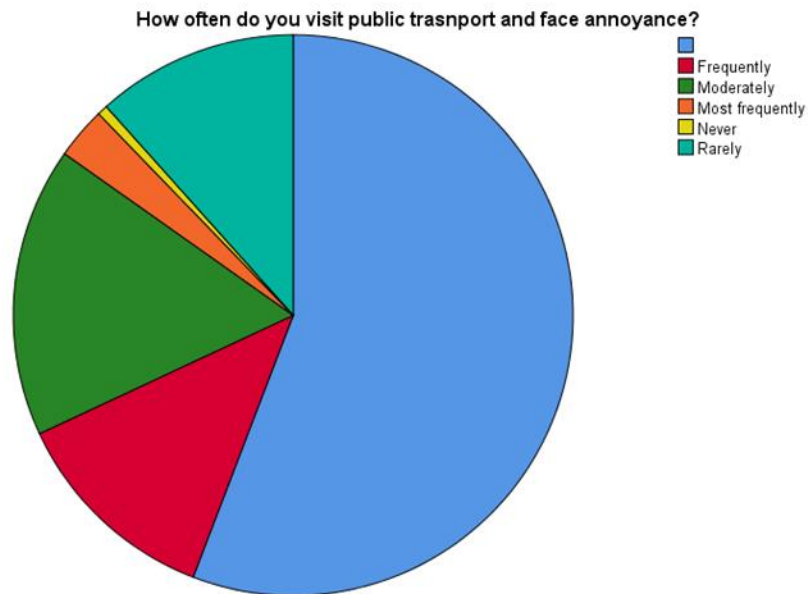


FIG 7: How often do you visit public transport and face annoyance

The above simple bar count shows the response of people about the annoyance they face while visiting public transport. about maximum 57.25% people and minimum 3% people considered that they face annoyance when visit public transport.

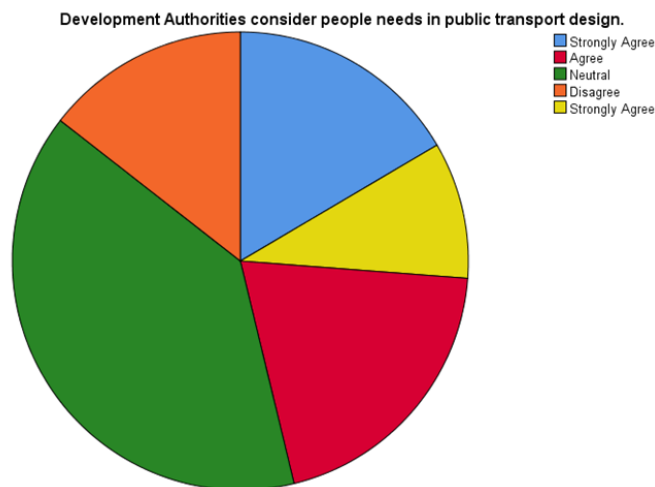


FIG 8: Do development authorities consider people needs in public transport design

The responses show that 58% people think that the development authorities should consider people needs while designing public transport as it become user friendly. And minimum 13% people consider that authorities incorporate pubic needs in designing of public transport.

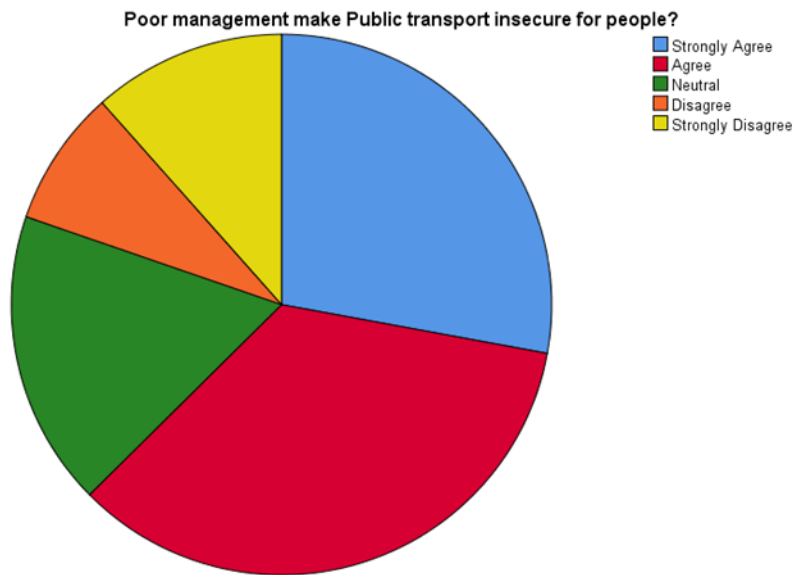


FIG 9: Poor Management Cause Public Transport Insecure for people

The figure shows that 52% respondent considered that public transport is insecure due to poor management of the staff and managing authority. This question helps to indicate the reason of insecurity of public transport.

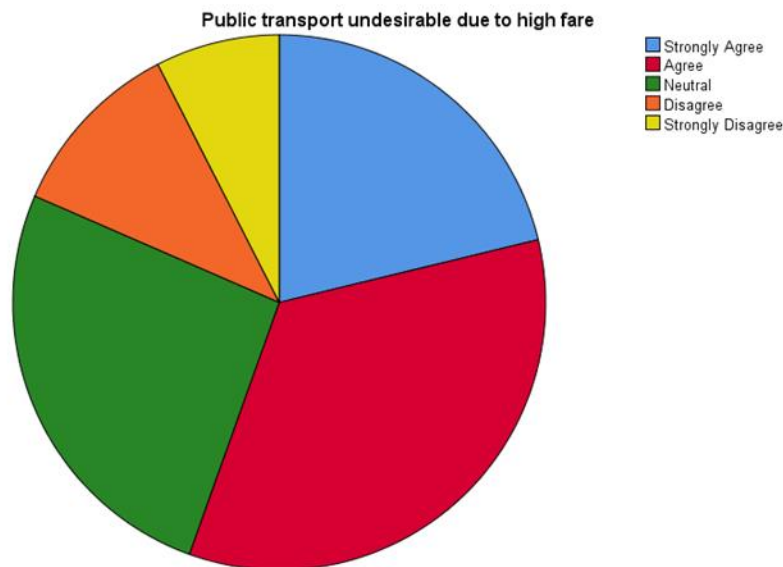


FIG 10: Rent of Public Transportation

The responses show that high fare is the reason of the people that they are not using public transport. maximum 50% people and minimum 11.09% people considered that they fare of public transport is high therefore it is undesirable for them

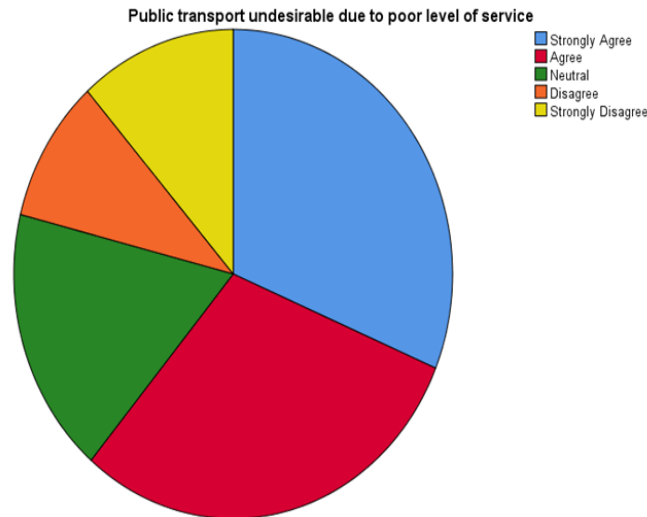


FIG 11: *Checking Undesirability of Public Transportation*

The graph shows the unitability of people in the context of level of service of public transport. About maximum 48% and minimum 12% people not considered that the dislike the public transport due to poor level of service.

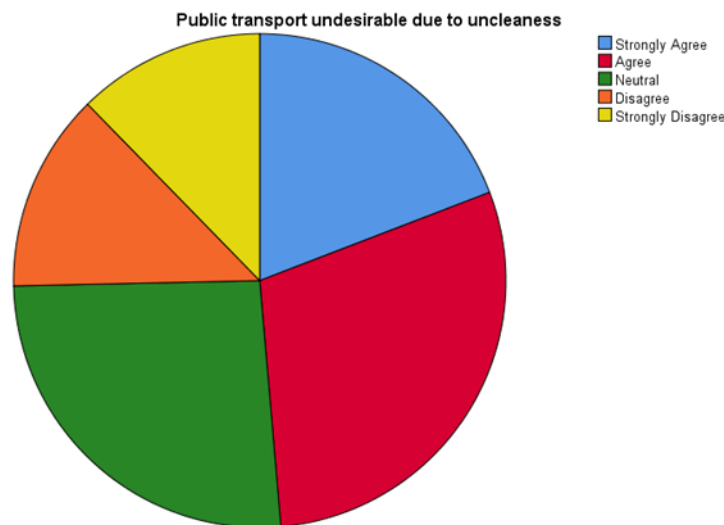


FIG 12: *Checking Undesirability of Public Transportation due to uncleanness*

The bar count shows that 43 % of people feels that public transport is undesirable due to dirty environment in it as it is not clean as the private transport.

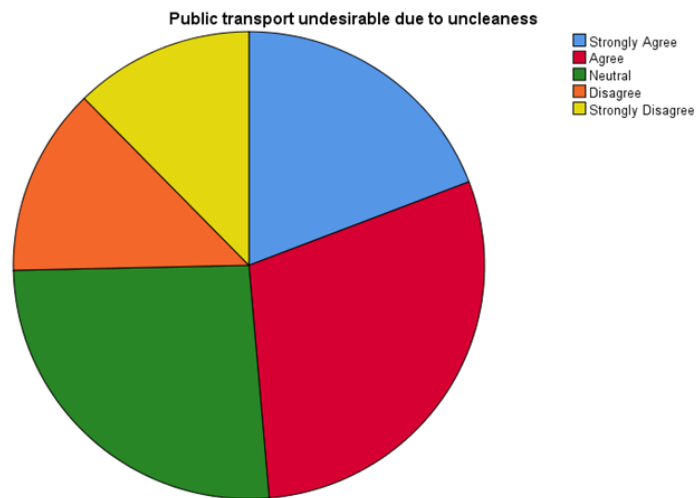


FIG 13: *Checking Undesirability of Public Transportation due to Inefficiency*

The responses showed that maximum 54% and minimum 11% people considered that public transport is undesirable due to inefficiency. Lack of innovation and facilities make the public transport inefficient as compared to private transport.

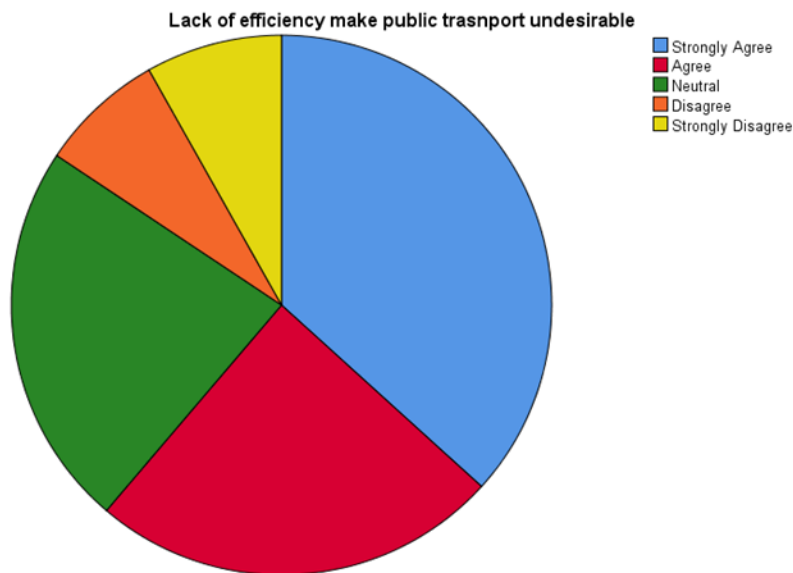


FIG 14: *Role of congestion in undesirability of Public Transportation*

The question indicates the reason of undesirability of people that they don't like public transport. maximum 48% and minimum 12% respondent considered that congesting is the reason behind that they unlike public transport.

ANALYSIS

To assess the value of dependent variables based on the values of independent variables (Multiple linear Regressions)

Research Question: why people prefer private transport over public transport?

Outcome variable=Dependent variable

Predictor variables=Independent variables

Hypothesis Testing:

The table below shows that the value of p is less than 0.05 so the analysis is significant, furthermore it indicates that regression analysis is possible for critical evaluation of dependant variable (preference of private transport over public transport) and its relationship with independent variables (Poor time management make public transport undesirable, People feel unsafe in public transport, Do you consider public transport economical than private transport, Development Authorities consider people needs in public transport design., Do you feel insecure Public Transport (Speedo, LTC, Rickshaw, Metro Buses), Public transport undesirable due to uncleanliness, Public transport undesirable due to high fare, Congestion make public transport undesirable, Public transport undesirable due to poor level of service, Lack of efficiency make public transport undesirable, Poor management make Public transport insecure for people?).

Table 1: Anova Analysis

Anova						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.327	7	6.618	78.530	.000 ^b
	Residual	11.714	139	.084		
	Total	58.041	146			

a. Dependent Variable: Do you prefer public transport over private transport?

b. Predictors: (Constant), Public transport undesirable due to uncleanliness, Congestion make public transport undesirable, do you consider public transport economical than private transport, public transport in Lahore is safe, public transport undesirable due to poor level of service, Poor management make public transport insecure for people? Lack of efficiency make public transport undesirable

Analysis is significant since the p value is less than 0.05

1.1.1. EXCLAMATION

ANOVA Purpose

If ANOVA is significant then you can go to the other boxes otherwise your regression analysis is not significant.

Model Summary

Table 4.2: Model summary for regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.893 ^a	.798	.788	.290

a. Predictors: (Constant), Public transport undesirable due to uncleanness, Congestion make public transport undesirable, do you consider public transport economical than private transport, public transport in Lahore is safe, public transport undesirable due to poor level of service, Poor management make public transport insecure for people? Lack of efficiency make public transport undesirable

R Square: 79.8% of the variance is accounted for preference of private transport over public transport

Coefficient box

Table 3: Coefficient box

Correlations							
		Do you prefer public transport over private transport?	Public transport in Lahore is safe	Do you consider public transport economical than private transport	Poor management make public transport insecure for people?	Public transport undesirable due to poor level of service	Congestion makes public transport undesirable
Pearson Correlation	Do you prefer public transport over private transport?	1.000	.812	.776	.792	.773	.686
	Public transport in Lahore is safe	.812	1.000	.860	.911	.916	.725
	Do you consider public transport economical	.776	.860	1.000	.937	.891	.726

	than private transport						
	Poor management make public transport insecure for people?	.792	.911	.937	1.000	.930	.717
	Public transport undesirable due to poor level of service	.773	.916	.891	.930	1.000	.764
	Congestion makes public transport undesirable	.686	.725	.726	.717	.764	1.000
	Lack of efficiency make public transport undesirable	.741	.947	.908	.946	.967	.746
	Public transport undesirable due to uncleanness	.719	.916	.889	.930	.934	.739

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.332	.100		3.330	.001	.135	.529
	Public transport in Lahore is safe	.965	.113	1.044	8.536	.000	.741	1.188
	Do you consider public transport economical than private transport	.351	.114	.351	3.073	.003	.125	.577

Poor management make public transport insecure for people?	.435	.142	.464	3.062	.003	.154	.716
Public transport undesirable due to poor level of service	.669	.156	.684	4.291	.000	.361	.977
Congestion makes public transport undesirable	.197	.069	.173	2.852	.005	.061	.334
Lack of efficiency make public transport undesirable	-1.370	.206	-1.409	-6.645	.000	-1.777	-.962
Public transport undesirable due to uncleanness	-.404	.130	-.409	-3.108	.002	-.661	-.147

REGRESSION EQUATION

$$Y = 0.332 + 0.965X_1 + 0.351X_2 + 0.435X_3 + 0.669X_4 + 0.197X_5$$

REGRESSION RESULTS

1. The dependent variable that preference to choose public transport is most effect by the independent variable security and level of services as their significant values are least that is 0.000.
2. The second most effected independent variable is cleanliness which have significant value is 0.002.
3. The third most effected independent variable are management and cost which have significant values are 0.003.
4. The fourth effected independent variable is congestion which have significant values is 0.005.

CONCLUSIONS

1. Although many cities, including Lahore, have adopted transportation policies influenced by the United States model of promoting private vehicles or the European and Japanese model of high-tech rail-based urban transportation, neither of these models is particularly well suited for city because in both cases, society and the environment bear the costs of individual mobility, and both the benefits and the costs are shared by society and the environment.
2. Since a result, the only solution acceptable for Lahore city is one that has been locally designed to meet the majority's problems, as the solution should be low-cost, environmentally sustainable, and responsive to the social demands of the local people.

3. However, locally designed development programs, particularly in urban transportation, raise questions about local institutions' institutional and human resource capacity.
4. In the case of Lahore, international agencies' technical and financial assistance has failed to focus on building the capacity of existing institutions, which could then design local solutions on their own. As a result of this discussion, a more in-depth examination of the role of institutional relationships and capacities in transportation planning among different levels of government, as well as their relationships with global agencies, is needed to explain urban transportation decision-making in Pakistan.
5. However, there has been no consideration given to 60 percent of the trips are made by pedestrians and other non-motorized modes of transportation. Although urban rail projects are being considered for various cities in Pakistan like Karachi, Islamabad etc., this is first effort in Lahore to solve urban transport problems through rail based technology.
6. However, there are some areas in Lahore where the city is fast expanding. It's unlikely that putting LRT in one corridor will alleviate traffic concerns while also improving environmental sustainability.
7. As a result, institutions in Lahore must design transportation policies that take into account particular demands and goals, as well as the city skills and resources. To achieve low-cost, safe, and resilient policy outcomes, financial restrictions must be overcome (Imran, 2003).
8. According to the Lahore Urban Development and Traffic Study (1981) conducted with World Bank/IDA assistance, the Lahore District had only 39,205 licensed and "on road" automobiles in 1974. With an annual growth rate of 6.31 percent, this number increased to 74,742 in 1979 and 652,082 in 1996. Motorcycles (53 percent), Motor Cars (29 percent), Trucks (1 percent), Delivery Vans (5 percent), Tractors (3 percent), Buses (3 percent), Taxis (2 percent), Rickshaw (3 percent), and others made up the percentage of total registered vehicles in Lahore in 1996. (1 percent) (NESPAK, 1997).

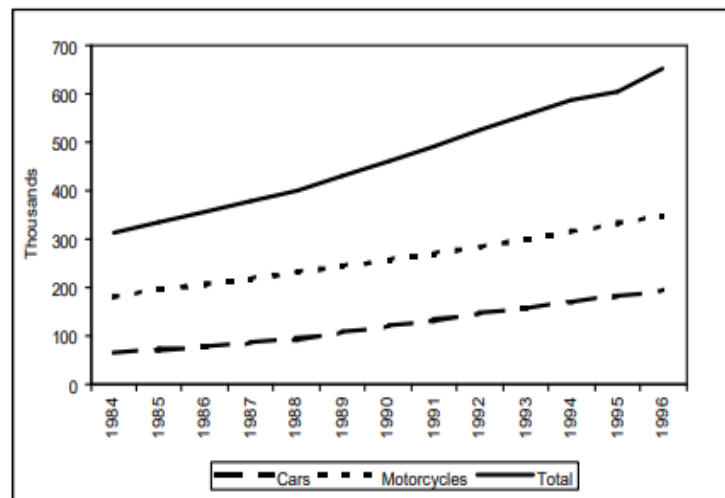


Figure 27: Growth of Registered Vehicles in Lahore District (1984-1996)

Source:(Nespak,1997)

The introduction of the Lahore Transport System (LTS) in 1997 marked a considerable improvement in the bus system. CNG (Compressed Natural Gas) and air-conditioned franchised

buses operated by multinational and national businesses have been launched as part of this program. However, this program has not been successful in garnering investment in the urban transportation sector from international agencies, which are more interested in investing in Lahore's Light Rail Project and Ring Road. Furthermore, the Lahore transportation systems, particularly public transportation, have completely overlooked the needs of women, the poor, and the elderly in urban transportation (Low, 2003).

RECOMMENDATION

1. By going through the in-depth study of the literature it has been found that the international countries like California, Singapore, Hong Kong and Delhi make the initiatives that make their transport sustainable .So it is recommended that to introduce smart shuttle/bus in Lahore to provide access to people on fixed route transit. It is the alternative method to personal vehicle or bus transit for short-haul feeders. The concept of shuttle bus service to ensure a sustainable public transportation system. The concept of shuttle bus service to ensure a sustainable public transportation system. Also recommended that to promote the use of environmental friendly fuel to reduce the vehicular emissions that create the pollution in Lahoere .The introduction of intelligent signals can effectively reduce the travel time by which the delays can be overcome.
2. To make the public transport sustainable and user friendly the security, travel time, cleanliness and the level of services should be effectively and efficiently manage so that the preference to use public transport can increase.
3. As the sustainability in the transport sector can be achieve by economic viability, environmental protection and social equity so measures such as making the fare at suitable rate that all needed passenger can afford to travel, use of less carbon combustion fuel should be use and the gender equality should be focused priority basis so that not only men but also the women can feel safe and comfortable to travel on the mood of transport.
4. The only option to efficiently meet transportation demand in large metropolitan areas like Lahore is to equip the city with a high-quality public transportation infrastructure that must be developed in tandem with urban expansion. Urban rail (RMTS) and Bus Rapid Transit (BRT) will make up the main network (BRT).it should be affordable ,operate fairly and efficiently and support a competitive economy as well as regional development .also operate on the techniques that reduces the emission rate and minimize the adverse effects on use of land and generation of noise.
5. Secondary and feeder services will be provided by buses of various sizes and types. Mass transit networks serve as the backbone of urban transportation infrastructure and are integrated with urban land use and development, according to the experiences of successful cities. In Lahore, the bus, including wagons, is and will continue to be the most essential method of public transportation.
6. The gap between the available road and the demand for travel has been revealed by the travel demand study. The supply and demand. The conclusion is clear: with a population growth rate of more than 2% and a GRDP growth rate of roughly 6%, the current network will be unable to meet future road traffic demand. The basic strategy for road network expansion is to increase road capacity to fill up the gaps.
7. Infrastructure is costly, and it must be managed and operated properly. As a result, traffic management is critical not only for traffic efficiency but also for safety, comfort, and the

urban environment. The current deterioration of the situation, particularly in terms of traffic safety, is intolerable.

8. Because the number of cars on the road is likely to rise sharply in the future, regulating the demand for private transportation will become a greater challenge.
9. The traffic conditions in Lahore's core district is the most important problem in the research area. The majority of intercity and intracity traffic congregates there Using radial arterial roadways is a good idea. Inadequate road infrastructure and haphazard traffic management Infrastructure exacerbates the problem. Defects in traffic management must be urgently addressed.

Developed and developing countries are prioritizing the development of pedestrian and cycling facilities in their designs, with the goal of eventually replacing their current reliance on automobiles. Pedestrian and cycling facilities are built into the modern urban fabric as a necessary component. There is currently no pedestrian policy or strategy in place in Lahore to help the city transition to a more sustainable transportation system. It's crucial to remember that while many people prefer to walk rather than drive as their single or major form of transportation, many others do not have that option. This includes children under the age of 16, as well as a large number of older and physically challenged individuals. This segment of the population should not be denied access to safe and reasonable walking possibilities. People should be able to walk securely in a culture that values choice and freedom, whether for joy and pleasure, errands, travelling to work or school, shopping, or other purposes. For the situation to significantly improve, pedestrian safety and mobility must be elevated to a high priority. Engineers, planners, and other state

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