Vol. 2 No.4 2024 - FALL

RECOGNIZED IN "Y" CATEGORY BY

Research Consortium Archive
P(ISSN) : 3007-0031
E(ISSN) : 3007-004X
https://rc-archive.com/index.php/Journal/about

WILLINGNESS TO PAY FOR IMPROVED PUBLIC TRANSPORT SYSTEM: A CASE STUDY OF TEHSIL MARDAN

Hamza Feroz
MPhil Scholar, School of Economics, Quaid I Azam University, Islamabad.
Email ID: Hamzaferoz095@gmail.com
Nafees Ahmad
Department of Economics, University of Malakand, Pakistan
Email: Nafeesahmad@uom.edu.pk
Imad Khan
Department of Economics, University of Swat, Pakistan
Email: imad@uswat.edu.pk
Rabia Majeed
Department of Economics, Pakhtunkhwa Economic Policy Research Institute (PEPRI), Abdul Wali Khan University Mardan, Khyber Pakhtunkhwa, Pakistan, Email: rabiaattas@awkum.edu.pk

Publisher : EDUCATION GENIUS SOLUTIONS
Review Type: Double Blind Peer Review

ABSTRACT

Efficient and Rapid intra-city transport is the dire need of metropolitans. The rapid, clean and latest vehicles used for public transport not only facilitates the residents of the city but also significantly affect the environment via reduction in hazardous vehicle emissions. This study aims to investigate the people's maximum willingness to pay for improved public transport system in Mardan. A sample of 200 respondents were interviewed across tehsil Mardan. The findings of the study illustrates that income and age of the respondents positively and significantly affect their willingness to pay for Improved Transport System. The study further reveals that people's maximum willingness to pay is not affected by education level and gender. In light of the findings of the study it is recommended that the government must intervene and designs efficient transport policy. Furthermore, the obsolete vehicles must be examined frequently and must be replaced if required.

Keywords: *Willingness to Pay, Transport System, OLS, Improve*

Introduction

Transportation network of any country plays a vital role in its development and affects all sectors through economic linkages. Intra city transport facility is equally significant as that of inter-cities transportation system, as thousands and millions of commuters of diverse age group, belonging to different economic class travels daily within the city from one point to another(Khan et al. 2011) . Developed countries have already taken up the issue of the intra city transportation and focused on developing the rapid mass transit system in their respect metropolitans. In Pakistan, roads congestion has increased manifolds in the last decade which has culminated in the environmental pollutions. Along with that our public transit system is also not safe and is insufficient to meet the daily commuters demand.

In the past few years, efforts have been made to improve transportation in Pakistan and to minimize the transport problems in major cities, but much more is still required to be done. In Feb, 2013 the Government of Punjab started Mass Transit System creating almost 1500 jobs and is facilitating 12,000 passengers every day. About 64 buses operate in 27km radius (Source: Govt.pk). Recently the Govt. of Khyber Pakhtunkhwa took the initiative and launched a project Bus Rapid Transport (BRT) system in Peshawar. The BRT corridor is expected to improve the quality of life of the city's residents by offering safer, efficient, and affordable public transportation and improve land values along the BRT Corridor and promote economic development and enhance the city outlook and reputation.(Source: Govt.pk).

Mardan, the second largest city of KPK by population, is faced with severe transportation problems. Outdated vehicles on the rugged roads with high fares and regular time delays, violating the

traffic rules, compromising on passenger's dignity and safety is one of the biggest issue, the people of Mardan are facing.
As Mardan is one of the fastest emerging city of KPK, It is essential for the inhabitants of the city that they must be provided with the sustainable transportation system. Keeping in view the issue, this study aims to estimate the demand by using the people's maximum willingness to pay for improved public transport system in tehsil Mardan.

Literature Review

(Stjernborg and Mattisson 2016) conducted a study to find how government view the existing public transport system and to identify the strategic importance of public transport system in Sweden. Contingent Valuation Method was employed to elicit the respondent's willingness to pay. The results of the study show that public transport not only promote development in urban structure but also create alternatives for labor mobility which is vital for overall economic growth of the region.

Indonesia faces the rapid increase in the population which adversely affecting the transport system and causing problems to the commuters. (Anwar, Salehudin et al. 2015) studied the people's WTP for improvement and adaption of Mass Rapid transport system in Greater Jakarta, Indonesia. In 2013 a survey was conducted in 13 different locations and the data was collected from 400 respondents by using non-probabilistic Sampling method. The result shows that both private and Public transport users were ready to adapt the MRT project and were willing to pay higher for MRT system in Jakarta Indonesia.

Traffic is one of the major problems in populated cities which creating negative externalities. (Mahirah, Azlina et al. 2015) investigated willingness to pay to reduce traffic in klang valley, Malaysia. The study aimed to find the road users willingness to pay for reducing traffic problems. The result reveals that road users were willing to payRM1.95 in klang, valley Highway. The results further reveal that toll payment Bid price has significant effect on the willingness to pay to reduce traffic issues.

Francisco 2010 conducted a studied for cleaner public transportation in Metro Manila. The research aimed to find maximum WTP to adopt zero-emission electric vehicles. The author used Stated preference methodology and secret ballot technique to estimate WTP.. The result show that Aggregate household benefits from improved air quality was US $ 130 million per year. The study shows that Metro Manila households have a positive and significant willingness to pay for the benefits of improved air quality from the adoption of cleaner public transport to replace the current fleet of diesel jeepneys with zero emission electric vehicles.

Eboli and Mazzulla 2008 conducted a research on WTP for improved public transport system. Logit model was used to measure WTP for improving transport service quality. The result of the study showed that Users are willing to pay 1 euro for an

improvement of public transport service consider in the SP experiment.

O'Gara, Mourato et al. 2007 studied Public Willingness to pay for hydrogen busses in Berlin, London, Luxembourg and Perth. The author used Contingent valuation method and estimated Hicksian Demand curve. The results, show that overall there is a positive response to accept the Hydrogen busses transport and willing to pay 0.32pound extra per single bus fare. And, both bus users and non-users are supported to introduce the Hydrogen busses transport system.

(McFadden 1998) argued that the question of revealed-preference or stated-preference experiments are likely to reveal center choices, and the real or hypothetical market conditions and stated-preference experimental designs which arise to be necessary to obtain reliable data on choices.

Research Methodolgy

The data from 200 randomly selected respondents of Tehsil Mardan was collected through a well-defined questionnaire which comprised of both open and close ended questions on the demographics, socio-economic factors and the maximum willingness

This study employs the Classical Linear Regression Model to estimate the impact of various variables which include Age of the Respondents in Years, Monthly Income of the Respondents, Education, and Gender. The parameters were estimated through Ordinary Least Square Method (OLS). The functional form of the model is given below:

$$Max_{WTP} = \alpha + \beta_{1Age} + \beta_{2Income} + \beta_{3Edu} + \beta_{4Gender} + \mu i \ldots\ldots\ldots\ldots\ldots \text{ eq (i)}$$

Where:

Max_{WTP} = Maximum Willingness to Pay of the respondents for Improved Transport System in Tehsil Mardan

Age = Age of the Respondents in Years

Education = Education Level of the Respondents

Gender = Gender of the Respondents

Data Analysis

Table: 1 Regression of WTP on Gender, Education, Age and Income

Maximum	Coefficient	Std. Err.	t	P>|t|
Gender	.8782759	3.7652	0.23	0.816
Education	1.895421	1.8550	1.02	0.308
Age	.3839332	.18319	2.10	0.031
Income	.0001481	.00003	3.75	0.000
_cons	9.089437	6.8873	1.32	0.188

The results presented in Table.1 indicates that there exists a positive and significant relationship between Respondents age and Willingness to Pay for Improved Public Transport System in tehsil Mardan. The result further reveals that the respondent's income (PKR per month) is positively affecting the WTP for improved Transport system in Tehsil Mardan. It is established that if there is an increase in the respondent's income (PKR per month), the willingness-to-pay for improved public transport system increases by PKR. 1.06. The results further reveals that the respondent's education level (in Years) and gender has no effect on their maximum willingness to pay for improved public transport system in study area.

Post Regression Diagnostics

The post estimations tests (VIF) used for the detection of multicollinarity and Heteroscedasticity shows that problem of multicollinarity is negligible. However, to account for heteroscedasticity the robust white standard errors were incorporated. The results of the post regression diagnostics are presented in table 2 and table 3 respectively

Table :2 VIF

Variables	VIF	1/VIF
Gender	1.09	0.921
Age	1.08	0.924
Income	1.06	0.941
Education	1.04	0.960

Table:3 Cameron and Trived's decomposition of IM-Test

Source	Chi2	Df	P
Heteroskedasticity	4.35	13	0.9868
Skewness	12.35	4	0.0150
Kurtosis	9.47	1	0.0021
Total	26.17	18	0.0960

Conclusion and Recommendations

In this research study, different aspects of willingness to pay for improved public transport system in tehsil Mardan have been examined. The data was collected through questionnaire from the study area i.e Tehsil Mardan. The results of the analysis revealed that that income and age of the respondent are positively and significantly related to the WTP for improved public transport system, thus any step towards improvement of these factors will positively affect the WTP for transport system in the study area. Furthermore, the age and the education level of the respondent are insignificant and hence no impact on people's maximum willingness to pay. The post regression diagnostics revealed that the problem of Multicollinarity was negligible and Heteroscedasticity was dealt by incorporating the robust standard errors.

In light of the findings of the study it is recommended that the people of the study area are using obsolete transport system

over the decades and are willing to pay extra amount for improvement in transport system. Hence, government must consider the projects directed towards improvement in transport system of the city. Better roads are key element for transport improvement. A paved road can reduce the congestion issue and hence contribute to the improvement of transport system. There is no proper regulation system on transport. Government must direct the concerned departments to frame the rules and the regulations i.e proper fare and timing system in order to increase the efficiency of the transport system. It was observed during the study that the outdated vehicles are used which contribute to the pollution and hence adversely affect the local environment. It is strongly recommended that Government must interfere by directing the concerned departments to frequently check the outdated vehicles and ban them for commuters.

References

Anwar, R., et al. (2015). "Intention to Adopt and Willingness to Pay: Mass Rapid Transport System in Greater Jakarta, Indonesia."

Mahirah, K., et al. (2015). "Valuing Road User's Willingness to Pay to Reduce Traffic Congestion in Klang Valley, Malaysia." *Asian Social Science* ***11****(25): 48.*

Stjernborg, V. and O. Mattisson (2016). "The Role of Public Transport in Society—A Case Study of General Policy Documents in Sweden." *Sustainability* ***8****(11): 1120.*

O'Garra, T., et al. (2007). "Is the public willing to pay for hydrogen buses? A comparative study of preferences in four cities." *Energy Policy* ***35****(7): 3630-3642.*

Eboli, L. and G. Mazzulla (2008). "Willingness-to-pay of public transport users for improvement in service quality."

McFadden, D. (1998). "Measuring willingness-to-pay for transportation improvements." *Theoretical Foundations of Travel Choice Modeling* ***339****: 364.*

Francisco, J. P. S. (2010). Are Metro Manila households willing to pay for cleaner public transport?,

https://www.siasat.pk/forum/showthread.php?525847-Peshawar-Rapid-Bus-Service

https://blogs.tribune.com.pk/.../lahore-metro-bus-system-a-major-step-in-pakistans-