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# Analysis for need of Non-Motorised Transport (NMT) facilities in Khamgaon city

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***Abstract:*** ***In our day to day life we have seen the emission from transport sector is increasing. Along with carbon emissions, the transport sector is also responsible for road congestion, local air pollution, noise and accidents. In urban areas, the share of both public transport and NMT has been decreasing, resulting in increasing negative impacts. Therefore development of NMT in the cities is very important. NMT comprises of walking, Cycling, wheel chair travel and small wheeled transport etc. This transport facilities fulfill transportation as well as recreational objectives as these are ecofriendly modes. Previous planning only focus on movement of MT and there is no planning for NMT but the scenario is most of the short trips upto 5km in our country are carried out by walking and cycling.. NMT promotes health as well as social equality and is free from pollution which makes it ecofriendly. NMT are affordable to all classes which maintains social equality among citizens. Present Indian scenario shows undermining of importance and safety of NMVs in Indian cities. In India it should be taken seriously to priorities the use of NMT and focus on implementation of this facilities, maintenance and operation of this system. The governments should run the programs to encourage the people to move towards the use of NMT.***

***This study aims to determine the need of NMT facilities within the city and people views regarding existing traffic conditions along main streets within the city. The city is divided in different parts as per wards and quessionnaire survey is carried out to know people views. The overall study shows the need for the provision of NMT facilities like footpaths, cycle ways, croos points at main streets within the city.***

***Keywords: NMT- Non Motorised Transport, NMV- Non Motorised Vehicles, MT- Motorised Transport***

## I. INTRODUCTION

Non-motorised modes include walking, bicycle and cycle rickshaw. In many Indian cities, cycle rickshaw is major mode of transport for short trips. These modes are independent of conventional fuels and don't have carbon emissions.. Thereby, they are truly low carbon modes. Low-income groups are dependent on these modes to reach their working places, educational institutes and other essential services. The NMT is beneficial for health but due to high income and no provision of NMT facilities its use is negligible. Also its users are limited , as they cannot afford other modes of transport. Even for longer distance the lower income families uses NMT. In 1980, the use of NMT is correlated with the individual income. But as the income goes on increasing the NMT use further goes on decreasing.. The state governments and city administration have not developed NMT facilities, this causes in decreasing service level and increasing danger to pedestrians and bicyclists. This results in least use of NMT with increase in income. Until and unless the share of NMT in major cities is increased the problem of carbon emission can not be treated. NMT is commuter of transportation to access the public transport system, especially by walking, cycling and cycle rickshaws. Typically, a public transport user is a pedestrian for at least one part of the trip – either during the access or egress part of the trip.

## II. METHODOLOGY

### *A. Introduction of City*

Khamgaon is city in Buldana district with largest landscape area and population.. It is well connected to all other big cities of India as well as Maharashtra with a National Highway 6. Khamgaon is also connected through railway network. It has small single lane network connected to nearest station Jalamb Junction. The city is the biggest market hub in the district from where large amount of goods is transported daily. Khamgaon is also an important educational hub in the district as most of the higher education institutes are situated here.

Khamgaon is known ast he hottest cities in Maharashtra with temperature ranging from 47–48$^0$C in summer. The rainfall in the city is low which results in draught conditions in this region.

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*1)* Existing Vehicle Scenario

| Type of vehicle | No. of vehicles |
|---|---|
| Two wheelers | 15761 |
| Cars | 1119 |
| Auto rikshaws | 1127 |

*2)* Air Quality Index 49

*3)* Population of city

As per the census record of 2011, the city has population around 94191. As per 2001 census it was 88687.

Population of city

By Arithmetic mean method

| Census year | Population | Decadal growth |
|---|---|---|
| 2001 | 88687 | 5504 |
| 2011 | 94191 | |
| 2021 | ? | ? |

*4)* Population forecast

Pn = Po + (n x i)

= 94191+ (1x 5504)

= 99695

Sample size

By Krejcie and Morgan"s formula

$$n = \frac{Z^2 NP(1-P)}{d^2\,(N-1) + Z^2 P(1-P)}$$

Where z = 1.96 for 95% Confidence Level and 5% Margin of Error

Populaton proportion P = 0.50

N = population size = 99695

d = ME = 0.05

$$n = \frac{1.96^2 \times 99695 \times 0.50(1-0.5)}{0.05^2(99695-1) + 1.96^2 \times 0.5(1-0.5)}$$

n = 382.68

n = 383

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*B. Quessionnaire Method*

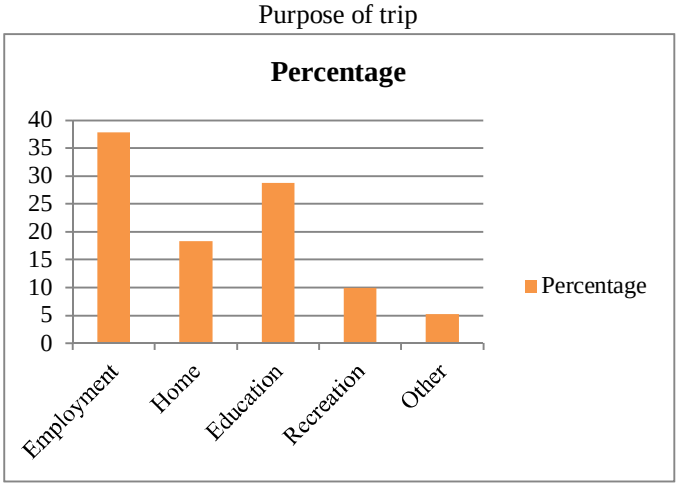
The quessionnaire is the method of survey which consist of a series of questions for the purpose of gathering information from viewers. It is not necessary that the quessionnaire is always used for stastical analysis, it may be used in different ways.

Questionnaires has its own merits over other types of surveys as these are less costly , it does not require lots of effort from the questioner as there is verbal or telephone surveys. It has standard set of answers which make it easy for survey. However, these standard answers may frustrate the respondent. Questionnaire must be limited to the fact so that respondents can easily read and understand the questions.

*C. Quessionnaire Format*

| Trip purpose | Employment | Home | Education | Recreation | Other | |
|---|---|---|---|---|---|---|
| Gender | Male | Female | | | | |
| Age Group | 10-20 | 21-35 | 36-50 | >50 | | |
| Make the trip | Daily | Weekly | Monthly | Ocassionally | | |
| Which mode did you use to reach the trip ? | Bus | Auto | Shared auto | 2 wheeler | Car | Cycle |
| Origin of trip | | | | | | |
| Destination(distance) | | | | | | |
| Quality of walking facilities | Excellent | Very Good | Good | Bad | Very Bad | |
| Quality of traffic | Comfortable | Moderate | Risky | Dangerous | | |
| Husehold income | <10000 | 10000-25000 | 25000-50000 | >50000 | | |

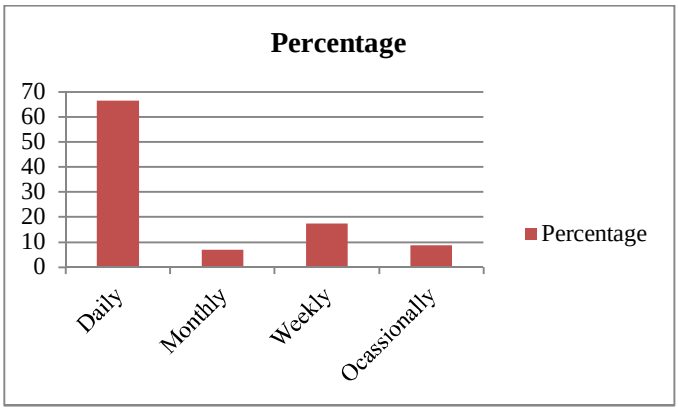
## III. RESULT AND DISCUSSION




The survey is carried to know the purpose of trip, which shows that the employee, workers and students are the road users maximum percentage . They have to tackle the traffic situation within the city.

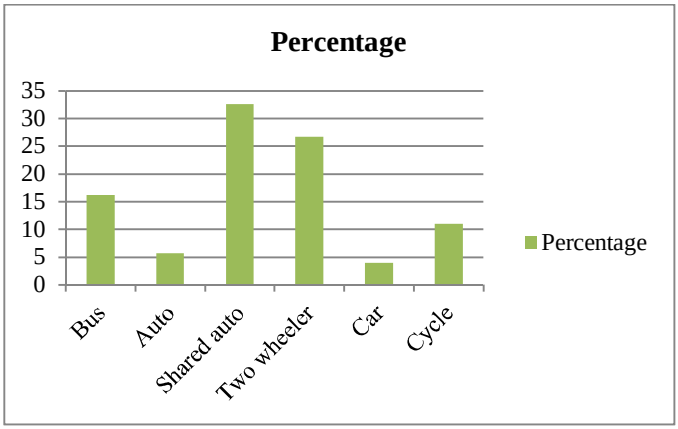
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Make the trip



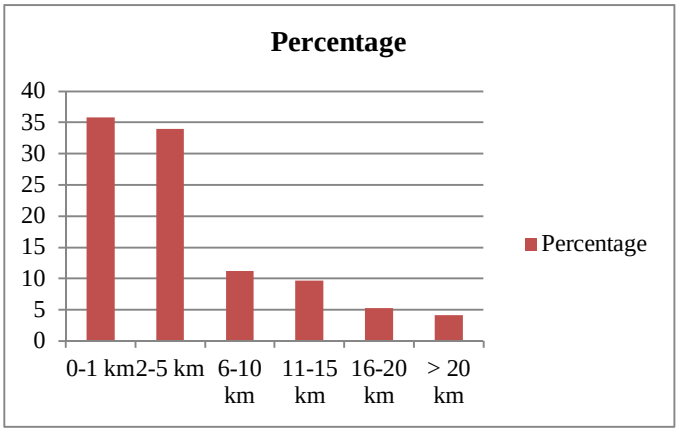

The survey for making the trip shows the daily users with maximum percentage among the others. The daily users faces the need for the special provision for cycle ways, walkways for the students within the city main streets.

Mode of transportation




As the maximum population belongs to middle class and lower middle class group, the use of shared auto and two wheelers is more as compared to other modes of transportation for short trips within the city.

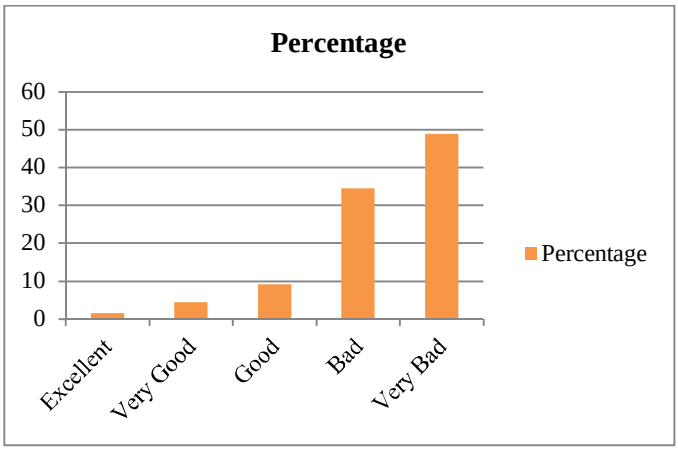
Origin and Destination distance




As every individual is pedestrian, the study also shows the maximum walking for the trips upto 1km and second largest with trips ranging from 2 to 5km.

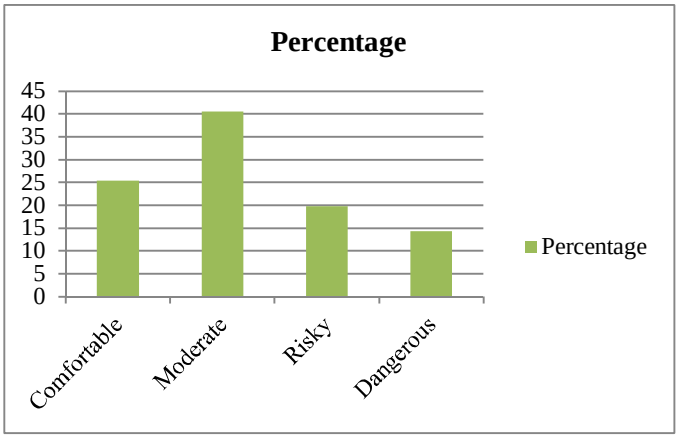
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Quality of walking facility



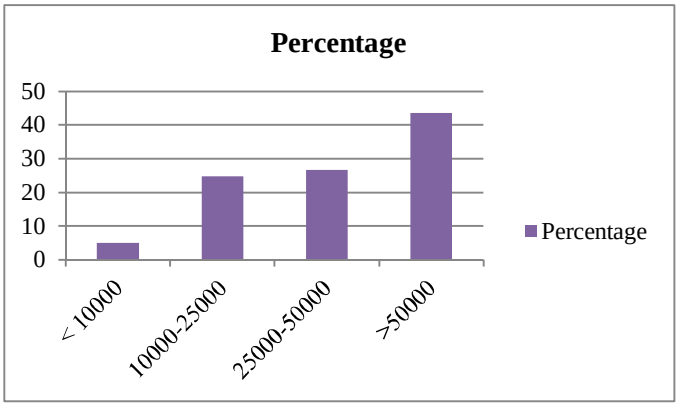

The quality of the walking facilities within the city is very bad as per people views. Threre is no proper provision of walkways and at places where footpaths are provide are seen to be broken and used for parking the vehicles.

Quality of traffic




The traffic quality is moderate but threre is no traffic regulatory measures for motorised as well as non motorized vehicles. So traffic regulation is not done properly.

Household income




The study for household income shows the maximum population having income more than 50 thousands. The middle income group shows the use of NMV is more and if the provisions are provided the traffic conditions can be handled in proper way.

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## IV. CONCLUSION

*A.* From the results of questionnaire survey it is observed that mostly people travel for their working place and education centres as compare to other purpose. The working people and students travel for their work with maximum 37.85% and 28.72% respectively.

*B.* The maximum trip from 0 to 1 km and 2 to 5 km areas is 35.77% and 33.94% respectively. From this it is concluded that most of the people prefer walking and cycling for short distances.

*C.* The quality of walking facilities is very bad as per people view with maximum of 48.82%. There is no provision of footpaths, crossing points for pedestrians in the city.

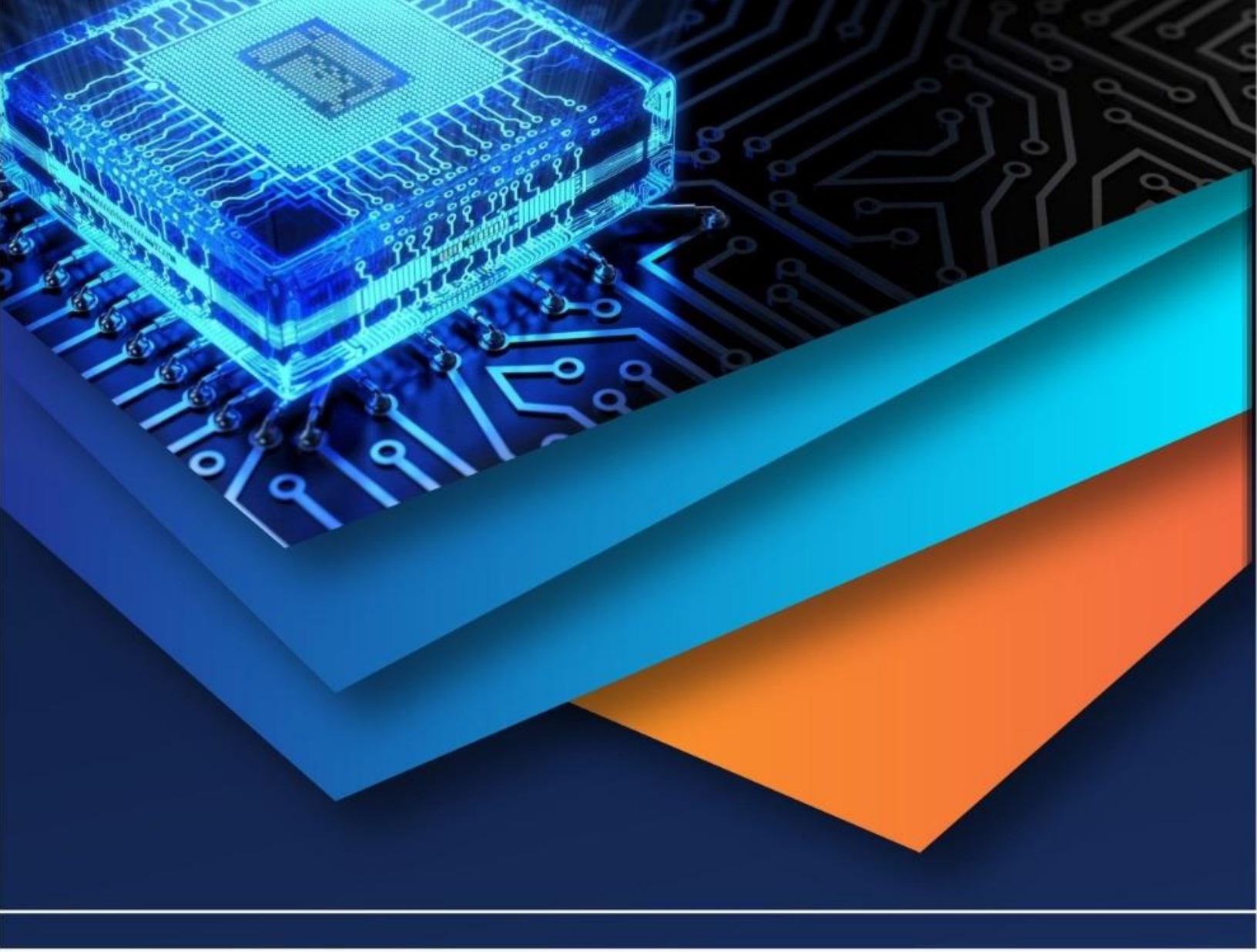
*D.* From the moderate traffic quality with 40.46 %, it is concluded that the traffic regulation should be done along the main streets so that it will not enter in risky and dangerous traffic conditions.There should be provision of walking facilities for pedestrians within the city.

*E.* With daily 66.65% road users and household income with 43.60% people need the proper NMT facilities for safe and secure travel within the city and fulfill the future upcoming demands.

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