Non Motorized Transport- A Case Study of Bidar City

Mr.Sunilkumar Birkur[1]
Assistant Professor,
Department of Civil Engineering,
Guru Nanak Dev Engineering College
Bidar- Karnataka

Md Faizan Ali [3]
BE Student, Department of Civil engineering,
Guru Nanak Dev Engineering College
Bidar- Karnataka

Md Abdul Nadeem[2]
BE Student, Department of Civil engineering,
Guru Nanak Dev Engineering College
Bidar- Karnataka

Md Tajamul Hussain[4]
BE Student, Department of Civil engineering,
Guru Nanak Dev Engineering College
Bidar- Karnataka

Mohammed Arif [5]
BE Student, Department of Civil engineering,
Guru Nanak Dev Engineering College
Bidar- Karnataka

***Abstract*— Non-motorized transport is vital for sustainable living. The characteristics of sustainable transport are safe, comfortable and efficient in terms of economic and energy consumption and minimize environmental pollution. With changing urbanization pattern along with socio-economic growth, a transport demand in urban area of India is growing rapidly. A sustainable transport system must meet the mobility and accessibility needs of people by providing safe and environmentally friendly modes of transportation. Non-motorized transportation (NMT) meets these objectives of sustainability as it utilizes indigenously available human and animal energy which is non-polluting, safe, and affordable and user friendly and need only a small fraction of the capital required for motorized transport.**

This study aims to suggest sustainable transport in terms of non-motor vehicle for a city that promises a better world for future generations. It provides options to change the choice of transport modes to road users of motor vehicles to non-motor vehicles through integration of non-motorized transport with existing public transport. By improving pedestrian path and cycling zone to increase non-motorized travel and reduce motor vehicles travel. The use of non motorized transportation such as cycling and walking is not only to reduce carbon footprint and reduce environmental impacts but also to promote healthy lifestyle.

Keywords—Non motorized transport, Sustainable transport, Cycling, Walking.

INTRODUCTION

Non- motorized transport includes walking, cycling and variations of small- wheeled human-powered transportation modes. With the exception of walking, these utilize non-motorized vehicles such as bicycles, skate-board ,push scooters, wheel chairs, and rickshaws .This entry focuses on the to primary non-motorized or active modes- walking and cycling for transport.

Non-motorized transport is vital for sustainable living the characteristics of sustainable transport are safe, comfortable and efficient in terms of economic and energy consumption and minimize environmental pollution. It provides basic mobility, affordable transport, access to motorized modes, physical fitness and enjoyment.

Due to lack of natural material such as oil reserves increase in number of deaths and injuries by motor vehicle accidents and traffic congestion, many countries across the globe have chosen NMT as a solution to the above problem. In medium size cites in Japan, Germany and the Netherland,40-60% of all the trips are made by walking and cycling**.**

1.1 NEED FOR STUDY:

The concept of sustainable transportation is vital to ensure clean environment, healthy and high quality. The concept also emphasis on the human life and the environment, to meet current and future needs. Today, the transportation systems in major cities have shown a bad image because of have traffic congestion, accidents, lack of access to public transport and carbon emissions to the atmosphere of space contributes to environmental pollution and imbalance in terms of quality of life in general mobility. Along with the promising concept of sustainable transport services to consumers and at the same time ensure the safety of road users and also help towards the welfare and the environment

Each individual can also play a role in supporting sustainable transport system, the easiest way is to use bicycles or walk to work. Walking and cycling is the ultimate 'zero carbon' and environmentally friendly solution to pollution by motor vehicles that have been used continuously for more than 20 years

OBJECTIVE OF THE STUDY:

The objective of the project is to develop a formal plan based on a publicly-supported vision with specific recommendations and concepts to create a bicycle and pedestrian network within and around the town

LITRATURE REVIEW:

Many studies have been done with respect to the impact determination of different factors affecting walking and cycling mode choice. Ortuzar (2000) and Parkin (2008) found a negative relationship between increasing car ownership and bicycle mode choice.

Wardman et al (2007) determined a negative effect for age on cycling in Britain, while Plaut (2005) determined a positive influence for age on walking and cycling in United States. Noland and Kunreuther (1995) found a positive likeliness for male in using walk and cycle; on the other hand Agrawal and Schimek (2007) determined a negative likeliness for male to walk. An increase in the travel time using cycle was determined having a reducing impact on the probability of choosing a cycle (Wardman et al, 1997).

Buys and Miller (2011) suggested that perceived transport convenience was modulated by journey destination and purpose, with subsequent impacts on travel mode choice. Supporting this notion Ortuzar (2000) found a positive impact for school purpose for bicycle mode. Other factors influencing NMT mode choice mentioned in studies were the population density and land-use.

Badoe and Miller (2000) pointed out the mixed results elicited by various studies on the effect of land-use and density. Cervero (1996) and Cervero and Kockelman (1997) respectively found out a positive correlation between NMT use and mixed land-use, and NMT use and high density.

Rodriguez and Joo (2004) arrived at a inconsistent relationship between non-motorized mode choice and increasing density. They also pointed to the necessity to include certain factors correlated with the environment factors, like vehicle ownership, so that the environmental factors are not over estimated.

In India only few studies has been done for identifying the impact of different factors on walk and cycle usage. One such study was done by Arasan et al (1996) in which the trip characteristics of travellers without vehicles was identified using a logit model. The authors in this study used a set of socio-economic variables and a travel related variable of trip distance in developing the logit model. Another was a segmentation analysis done by Rastogi and Rao (2009) for different modes including an NMT using socio-economic variables and travel related variables.

Jain et al (2010) evaluated the influence of bicyclist comfort and safety perception using a route choice model. Other NMT studies mainly pertained to analyzing, walking distance, walking speed, and wand walking flow (Arasan et al, 1994; Rastogi et al, 2011; Rastogi and Rao, 2003; Laxman et al, 2010). From the above literature review it is clear that there is a dearth of studies for understanding the impact of various factors influencing NMT mode choice in India.

METHODOLOGY:

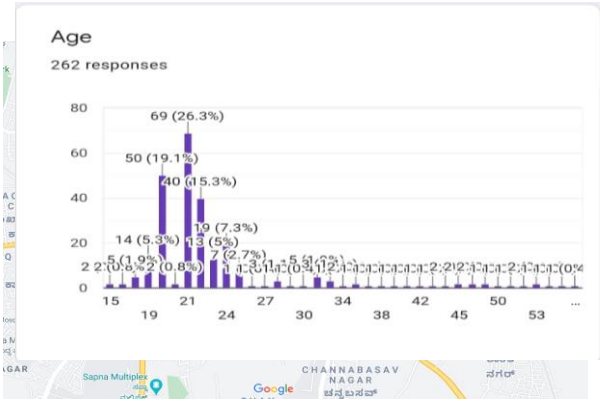
1. Collecting the primary data for the project
2. Collecting the opinion of the Bidar citizens to propose non motorized transport

- Data such as the growth of population of the city, the road lengths and the land usage distributions collected and analysed. The above-mentioned data of over span of 3 decades is collected from various government departments.
- The source of population data is collected from the Office of the Registrar General and Census Commissioner
- Analysing road network, vehicular growth, parking facilities and traffic safety factors.
- Roads of the city connects its different parts to one another, we analyse roads with hotspots of the city such as schools, institutes and shopping areas and the city bus stand to integrated the NMT with the existing network of city buses.
- Collecting data of the parking facilities and pattern along with the traffic safety factors to ensure the safety and comfort of the users
- The vehicular growth data is collected from Regional Transport Office

STRETCH 1: MADIWAL CIRCLE TO NAUBAD (ABOUT 4.5 KMS)

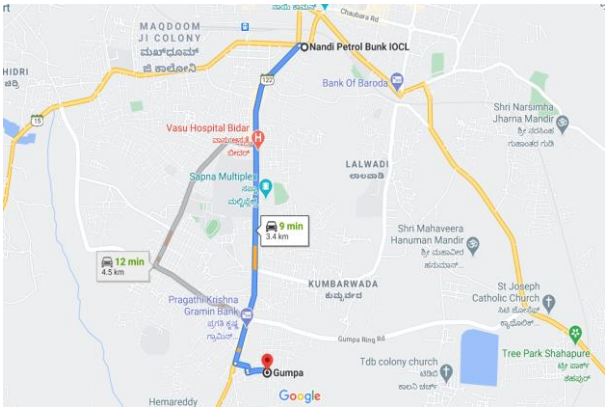
Travel time by:
Walk: 1 hour 17 min Cycle: 43 min Bike: 17min
Car: 14 min

STRETCH 2: AMBEDKAR CIRCLE TO KARNATAKA DEGREE COLLEGE (ABOUT 2 KMS)



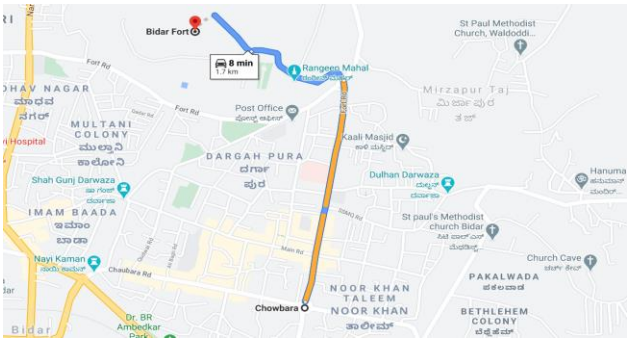
Travel time by:
Walk: 15 min Cycle: 6 min Bike: 3 min
Car: 2 min

STRETCH 3: NANDI PETROL PUMP TO GUMPA (ABOUT 3.4 KMS)



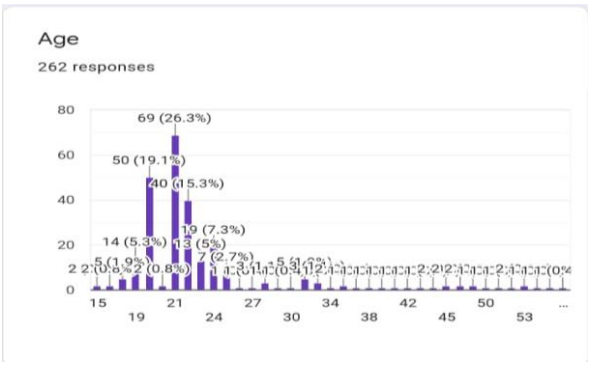
Travel time by:
Walk: 44 min Cycle: 27 min Bike: 15 min
Car: 11 min

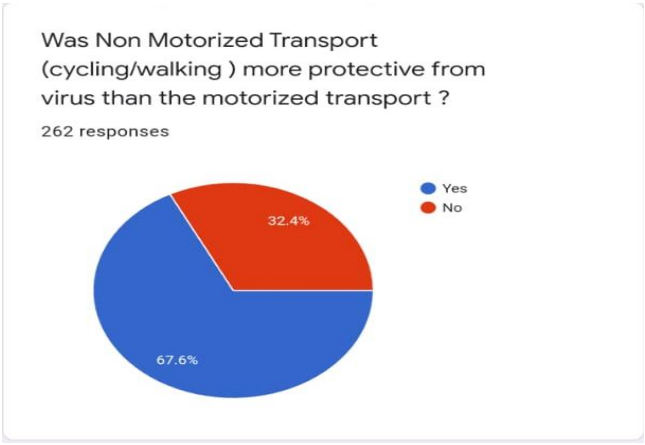
STRETCH 4: CHAUBARA TO BIDAR FORT (ABOUT 1.7 KMS)

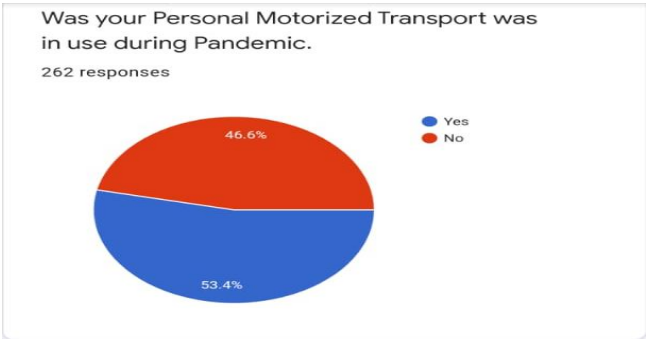


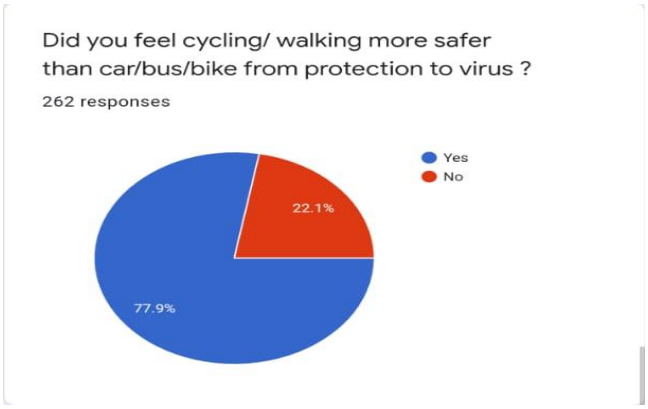
Travel time by:
Walk: 18 min Cycle: 11 min Bike: 6 min
Car: 8 min

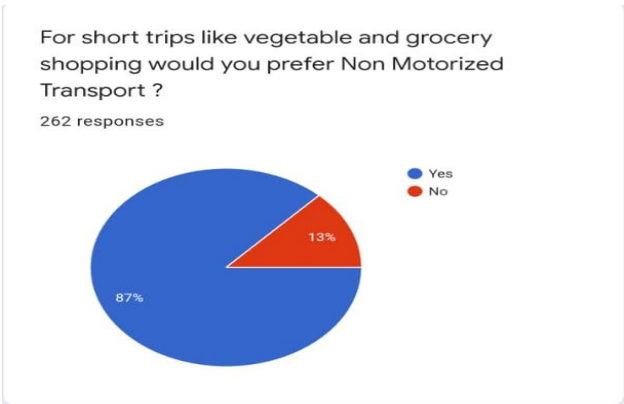
Collected opinions of peoples through Google form because it was the time of lock down due to Covid-19 pandemic.

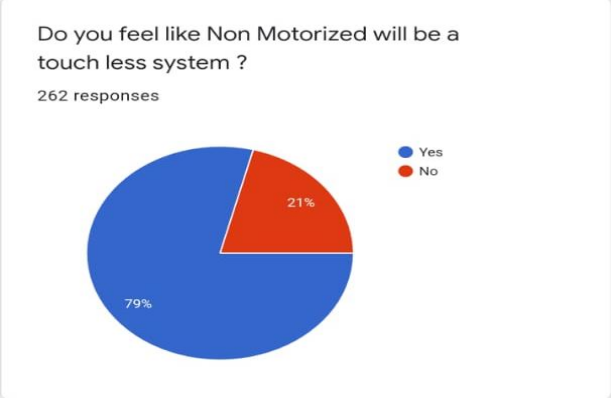


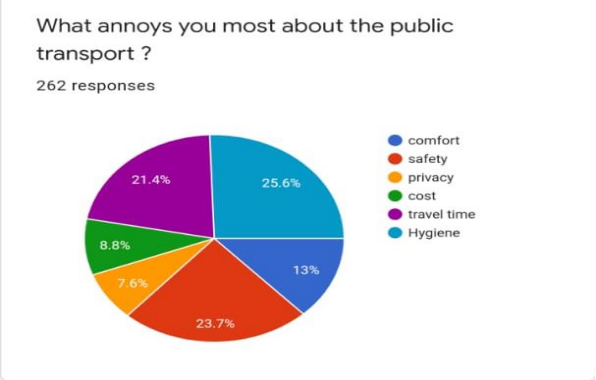


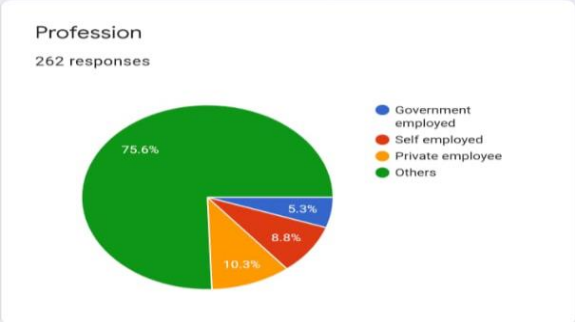


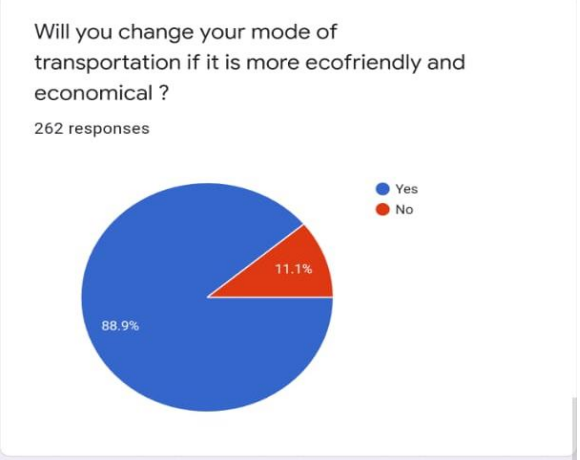


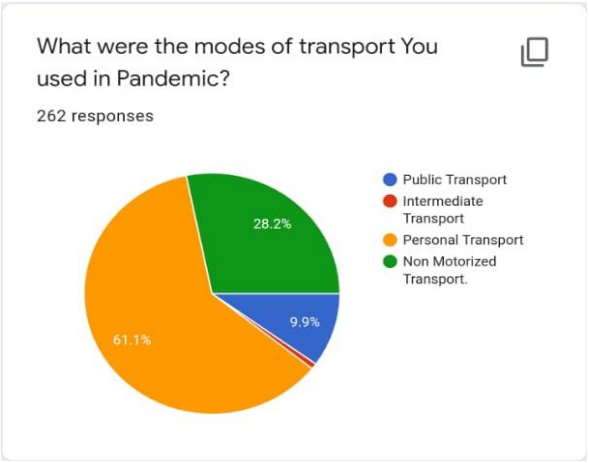


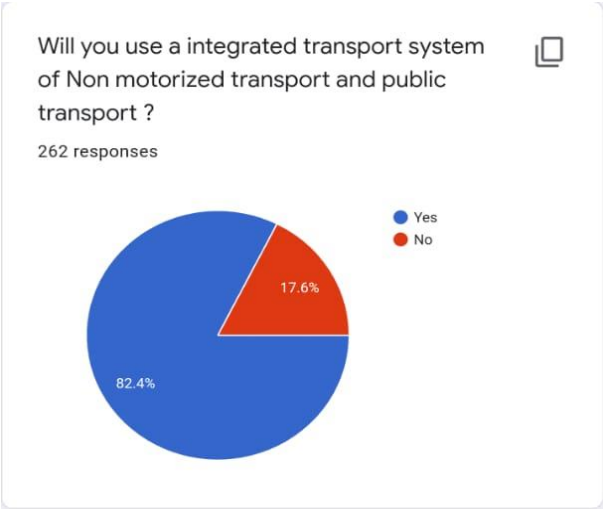












The above survey was performed to note the vehicular use of people in Bidar city during initial pandemic and also their future interested in NMT. The collected data shows a positive response towards NMT.

The people think walking and cycling is health beneficial and economical from motorized transport. The people are interested to shift to an integrated network of NMT and public transport nodes.

RESULT AND DISCUSSION

- Over the past three decades it was observed that there is an increase in the vehicle registration in BIDAR city. This increase in vehicular growth has increased pollution and traffic congestions.

- According to the survey conducted by us 90.8% of the people think that cycling and walking are more health beneficial for them, 88.9% of the people think that NMT

is more eco friendly and economical in comparison with motorized transport.

- 82.4% of people have agreed to use an integrated transport system of NMT and public transport whereas 87% of the people preferred to use NMT for short trips such as grocery shopping, vegetables and other necessary needs.

SUGGESTIONS PROVIDED

The analysis indicates that the role of non-motorized modes in catering to the sustainable urban planning and fulfilling the transport demand for the city is quite significant. With growing economic affluence and fascination for auto vehicles acquisition in urban areas, the dependence on NMT modes will be persisting a foreseeable future. The transportation planning studies conducted so far in this city have not paid needed attention towards providing adequate infrastructural facilities for NMT. Also, the poorer sections of the urban population dependent on no motorized modes are exposed to greater road accidents risks as majority of the road users killed and injured in road accidents in city are pedestrians and cyclists. To improve the present situation of NMT modes following measures are suggested:

1. Official policy acceptance of the role of NMT as universal modes in urban planning.

2. Protection of their due share in planning and making provision of road space and network, parking and ancillary facilities.
3. Treating these modes as preferred transport options in traffic and transport management, no area barred to them.

4. Transport and traffic management should ensure easy and convenient walk or use a bicycle. The key requirements are segregation of road space into footpaths, cycle paths and motor paths and adequate provision for movement of NMT over road crossing and junctions. Traffic signalling and other measures should ensure direct, safe and comfortable mobility for NMT.

5. Traffic calming measures are necessary wherever pedestrians and slow traffic have to cross the fast motor traffic.

6. Suitable transport model that can provide a planning for mix of mass transit and NMT together can produce a better city. This can also help in land use planning, controlling city size and slum development.

7. Compared with NMT, motorized transport imposes heavy external, social and strategic costs, which borne by the society but not charged. These include not only the obvious costs of pollution and environmental damage, accidents, congestion, infrastructure and land, but also strategic cost of rising petroleum imports, traffic and transport management cost.

8. Pedestrian zones should be identified such as pedestrian malls, a street lined with storefronts and closed off to most automobile traffic. Emergency vehicles have access at all times and delivery vehicles are restricted to either limited delivery hours or entrances on the back streets.

9. The City should adopt a two-part pedestrian improvement plan: Part One outlining the policies and plans for improving conditions for walking and Part Two giving detailed design manual for pedestrian facilities on the road side.

10. We also recommend free City-cycle stand should be planned and designed around the city at train and subway stations, parking lots and large housing blocks. These stands may also be stationed around common final destinations, such as office buildings, shopping districts, parks and other tourist attractions. By depositing money anyone can take a bicycle and cycle wherever they want, within downtown (restricted area). When the bicycle is returned to any bicycle stand within the area, the user gets their deposit back.

CONCLUSIONS

The traffic and transportation problems in BIDAR are aggravating due to numerous causative factors. The growth and usages of motorized vehicles need to be curbed with the development of alternative transportation modes.

Non-motorized vehicles can bridge the gap between walking and motorized transport. NMT is economical for user and facilitator as well as it can serve as an alternative for solving the problem of urban mobility. It is high time that planners should accept them as part of formal transport planning.

The usages of non-motorized modes particularly the cycles need to be encouraged with the provision of appropriate facilities for its safe and efficient movement on high–density corridors.

The pedestrians are the most neglected class of road user in the city. Appropriate pedestrian facilities need to be planned and developed. The traffic police of the city may launch a vigorous “pedestrian education programme” to curb the high incidence of road fatalities among the pedestrians.

The district administration or district urban development cell (DUDC) should show interest in educating or making aware of benefits of non motorized transport and encourage for the usage of non motorized transport.

REFERENCES:

[1] Matt Biggar (2020), Non-Motorized Transport; Walking and Cycling.
[2] NijatValiyey, Henrik Grenn and World Bank team (2019), Development of Non-Motorized Transportation in Baku city.
[3] Dr. Rakesh Kumar Jain (2015): non-motorized transport and sustainable urban planning: a case study of pune metropolitan region

[4] Dr. Marianne Vanderschuren (2012), non-motorized transport in Africa.
[5] Bibie Sara Salleh, RizaAtiq Abdullah O. K Rehmat and Amiruddin Ismail (2014), A study on non-motorize (NMT) Activities for urban environment.
[6] Directorate of Urban Land Transport (2014) Non-Motorized Transit infrastructure facility near proposed PBS locations in Mysore.
[7] Bristow, A. L., May, A. D. and Shepherd, S. P. Land use-transport integration Models: the role of environment and accessibility in location choice. Selected Proceedings of 8th WCTR, held in Yokohama, Japan. Vol. III, 1997, pp. 277–240, Delhi Pedestrian Design Guidelines. 2009,
[8] Karathiya, M. B., Patel, D. J. and Shukla, P. C. Application of Artificial Neural Network In Metropolitan Landscape Water Eminence Assessment. International journal of Computer Engineering & Technology, 3(2), 2012, pp. 12–18.
[9] Luthra, A. Sustainable transport policy for medium and small cities of India, Proceedings of National Conference on Transportation Systems, I. I. T., New Delhi, 2002, pp. 152–161.