

A study on NMT Activities in Urban Area

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Abstract— This paper provides an overview of the current use of non-motorized vehicles (NMVs) In Asia, the characteristics of NMVs and facilities that serve them, and policies that influence their use, Including all modes of NMV Pedestrians, Bicycle, Bullock cart and Horse cart etc. The paper identifies conditions under which NMV use should be encouraged for urban transport, obstacles to the development of NMVs, and identifies desirable steps that might be taken to develop a Non-Motorized Transport Strategy for a city or region, in Asia and other parts of the world. The NMV network in a city should consist of continuous NMV routes that are consistent with the origin-destination pairs of NMV operators and users. The routes should be direct and continuous Rajkot cities in Saurashtra region of Gujarat states. In this city day to day increase populations and affect to traffic problems. Not proper riding to vehicles on road and not safety for Pedestrians, Cyclist on the road side. Many surveys are including to traffic problems and its many analysis measures have proposed which should be required efficient and appropriate movement of huge numbers of pedestrians and cyclist at selected intersections.

Keywords: NMV (Non-motorized-vehicles), Cyclist, Pedestrians

I. INTRODUCTION

Non-motorized vehicles such as cycle-rickshaws, animal carts, and handcarts have traditionally been an essential means of transporting people and goods in cities and towns in the early stages of economic development, particularly in Asia and Africa. In recent years, however, they have come under an increasing threat that has led to their almost complete disappearance in some major cities in Asia. In Penang, Malaysia cycle-rickshaws are declining in numbers, in contrast to the growth in the motorcycle fleet in the country. It is a similar picture in Surabaya, Indonesia. These trends reflect a gradual move away from rickshaws towards motorcycle based vehicles. This situation is compounded by many government appearing to be actively discriminating against non-motorized vehicles with policies designed to discourage their use because of congestion and social issues.

Accident statistics, with respect to cycle-rickshaws, are scarce and unreliable (underreporting is a big problem), but R. Gallagher, in *The Cycle-rickshaws of Bangladesh* (1992), estimates that in 1986 and 1987, cycle-rickshaws accounted for about 10 percent of road deaths in Dhaka (based on newspaper reports). The lack of comprehensive accident data systems, coupled with the underreporting of many accidents, prevents detailed analysis from being carried out and thus the most suitable remedial measures cannot necessarily be implemented, be they engineering, enforcement, or education.

Non-motorized vehicles are usually moving faster than pedestrian and slower than motorized vehicles. Like for cyclists and motorcycles, non-motorized vehicles are left to

manage in the general traffic stream alongside larger and faster motor vehicles. Usually they take up more space as they are wider, and they are a little clumsier in their ability to maneuvers, being mechanical or because of carrying huge loads. As for cyclists they sometimes behave like motorists, sometimes like pedestrians. There is not always a license system for non-motorized traffic, still the riders must know traffic rules, how to behave and avoid conflicts in traffic with high speed vehicles and motor-cycles. Education might improve this. Conspicuity and being perceived accurately by other road users are extremely important factors for non-motorized vehicles.

The most serious conflict a non-motorized vehicle can experience is being hit by a fast moving vehicle, and the higher the speed the stronger impact and risk of injury. Most severe and fatal accidents happen either at road junctions, or at crossings between a street and a cycle track. This is particularly the case in urban areas. Many conflicts happen because the driver of the motor vehicle mist-read the situation, underestimate the speed, not following the traffic rules or in some cases, does not see the non-motorized

II. OBJECTIVES

- 1) To recognize the factors that affect Non-motorized transport in Rajkot city.
- 2) To calculate Bicycle Compatibility Index (BCI) to find the Level of Service (LOS) of the study area for
- 3) Non-motorized transport.
- 4) To suggest improvement measures for the betterment of Roads conditions by increasing the level of service.
- 5) To provide suggestions to improve non-motorized transport parameters on Indian Urban roads.

III. METHODOLOGY

A. Pedestrian:

Young pedestrians in the middle of the road Pedestrians are the road users at greatest risk in most developing countries accounting for up to 75% of all road fatalities. While this can be partially explained by the low motorization levels in developing countries with walking trips likely to dominate travel patterns, traditional transport planning and road design have tended to focus on providing for motor vehicles and have largely overlooked pedestrians and their safety.

Low-income countries have also been found, in general, to have a higher percentage of child pedestrian deaths, largely explained by the population age distribution and increased exposure for that age group. According to WHO estimates for 2002, 15% of global road fatalities were children (0-14) of which 97% occurred in low-income and middle-income countries. Older pedestrians are also associated with a very high rate of road injury and death.



1) Walking Pedestrians

When people are walking, they usually choose the shortest route and do not want to spend any extra time on the trip. They obey the rules when they think it is sensible and necessary. Taking the shortest route can mean that they do not use underpasses or pedestrian crossings. They may not obey traffic lights, if waiting for the green light seems to take too long. Pedestrians on familiar routes tend to pay less attention to traffic than when walking in unknown surroundings. Children may play and can also suddenly rush into the street

On their own, pedestrians are not a danger to themselves or others, but the conflict between motorized traffic and vulnerable road users that is potentially dangerous. Typical dangerous situations for pedestrians are drivers travelling at too high speeds, given the traffic circumstances, overtaking just before a pedestrian crossing, pedestrians not able to judge the speed when choosing a 'gap' in the traffic to cross the road in and lack of attention from both pedestrians and drivers.

Pedestrians form a significant group of vulnerable road users. So, it is vital that the footpaths of pedestrians should be given full and detailed attention. Footpaths have great potential for enhancing pedestrian safety. Every effort should therefore be made to segregate pedestrians and vehicles.

2) Crossing Pedestrians:

There is a strong necessity and desire for pedestrians to cross the road all along it and suitable provision must be designed to allow for it at appropriate locations. Pedestrians usually tend to take the shortest routes between any two points. If using a crossing impose much additional walking distance, or no perceived risk reduction then there will be a marked unwillingness to use it. Great care is needed therefore in siting pedestrian crossing so that use is maximized and pedestrians are clearly visible to drivers.

Crossing based on priority rules rather than signals demand a degree of driver obedience that is rarely found in cities and towns in India. Driving culture and self-discipline needs lot of improvement. Pedestrian crossing on high speed roads can lead to rear-end collision if drivers are not given sufficient advance warning. Where driver compliance is low and vehicle speeds are high pedestrian crossing can be merged with road humps to give raised pedestrian crossing. These are very cost effective but must be clearly marked and require adequate advance warning.

B. Bicyclists

Bicycles in the middle of heavy traffic. There are some 800 million bicycles in the world, twice the number of cars. In Asia alone, bicycles carry more people than do all the world's cars. Nonetheless, in many countries, bicycle injuries are not given proper recognition as part of the road safety problem and attract little research. In Beijing, China, about a third of all traffic deaths occur among bicyclists.

In India, bicyclists represent between 12% and 21% of road user fatalities, the second-largest category after pedestrians. While some consideration has been given to pedestrians' needs, especially as they cross roads and come into direct conflict with vehicle flows, bicycles, non-motorized vehicles and motorcycles are often left to manage in the general traffic stream alongside larger and faster motor vehicles.



Cyclists have a difficult position in traffic. They are sometimes supposed to follow rules for motorists, sometimes rules like those intended for pedestrians. Their needs are similar to those of pedestrians (shortest routes, smooth surfacing), but they are taken into account in traffic as a last resort. The situation does not encourage homogeneous patterns of behaviour. The younger cyclists are not yet able to cope with all the traffic signs and rules that apply to them. Young cyclists often like to play and show off, which leads to risk taking. There is also some amount of recklessness among adult cyclists, especially at signalised intersections, where they are often more inclined to act upon their own perception of traffic rather than wait for the red light and when performing turning movements. Elderly cyclists' capability to cope with the traffic situation and concentrate on cycling decreases with age; cyclists tend to react more slowly. Just like pedestrians, they choose the shortest possible route to reach their destination, which sometimes leads them to use one-way streets in the wrong direction, or to cycle on the pavement, thus creating conflicts with pedestrians. The influence of alcohol can very much affect the ability to ride a bicycle safely.

There is a close relationship between vehicle speed and safety that materializes in two ways: the probability of a road crash taking place increases with speed; and the outcome of the crash strongly depends on the collision speed. As the words "vulnerable road users" imply, cyclists and pedestrians are more likely to suffer from a collision/conflict than car drivers and passengers. Most reported severe and fatal accidents involving cyclists have

been found to occur either at road junctions, or at crossings between a street and a cycle track. This is particularly the case in urban areas. Accidents appear to be more severe when the cyclist is hit by a turning vehicle - but falls, skidding accidents, and hitting obstacles like the kerb can also be harmful to the cyclists. Cyclists using pedestrian facilities can also prove dangerous, mostly to pedestrians. Drivers do not always follow the traffic rules either, or just simply fail to see the cyclists.

C. Non-motorized vehicles

Non-motorized vehicles such as cycle-rickshaws, animal carts, and handcarts have traditionally been an essential means of transporting people and goods in cities and towns in the early stages of economic development, particularly in Asia and Africa. In recent years, however, they have come under an increasing threat that has led to their almost complete disappearance in some major cities in Asia. In Penang, Malaysia cycle-rickshaws are declining in numbers, in contrast to the growth in the motorcycle fleet in the country. It is a similar picture in Surabaya, Indonesia. These trends reflect a gradual move away from rickshaws towards motorcycle based vehicles. This situation is compounded by many governments appearing to be actively discriminating against non-motorized vehicles with policies designed to discourage their use because of congestion and social issues.

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IV. STUDY AREA

- 1) **Role of Transportation in Rajkot** The Rajkot city has a dense road network. Because of the concentration of various commercial and industrial activities in Rajkot and surrounding towns. The Rajkot city road network is leading to the surrounding towns is heavily congested. The regional network includes NH-8B(NH 27), State Highways (SH-26, SH-27, SH-42) and District Roads. Rajkot city has a two ring road the influence area, in terms of travel demand, covers the revenue districts of Rajkot. There is heavy inflow and outflow of traffic from the region into the city. The Jamnagar, Gondal railway lines pass through middle of Rajkot City. Most of the mini buses are operated by private operators. Transportation is the backbone to the development of urban area. As a result public transport becomes financially less viable, speed reduces and congestion levels increase and the transportation becomes source of environmental problems. Vehicles are major source of urban air pollution. Traffic transportation services and road networks are key indicators to provide the image of city, so to design the strategic plan for Rajkot city is a very critical exercise and hence it is carried out precisely.
- 2) **Population Rajkot** is the fourth largest city in Gujarat. Rajkot is the 35th largest urban agglomeration in India, with a population more than 1.2 million as of 2015

YEAR	POPULATION	GROWTH RATE
1901	36,151	-
1911	34,191	-5.42
1921	45,845	+34.08
1931	59,122	+28.96

1941	66,353	+12.23
1951	132,069	+99.04
1961	194,145	+47.00
1971	300,112	+54.58
1981	445,076	+48.30
1991	559,407	+25.69
2001	1,002,000	+79.12
2011	1.286,995	+28.31

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