



Analysis of Traffic Congestion and Remedial Measures at Traffic Mor in Pabna City, Bangladesh

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Abstract— The economic development of a country mostly depends on the good transportation system. Development of new transportation system involve huge amount of money and time. Most of the cases the invested money is irreversible. The developing country like Bangladesh the best approach is to improvement of existing facilities we have. Pabna, one of the rising cities in Bangladesh. As a result the population in Pabna increasing day by day, so as the traffic congestion. Traffic Mor is one of the major intersection in Pabna city. In overall context Traffic Mor road intersection plays an important role in existing traffic system of the city. Traffic Mor road intersection is tee type road intersection at level. Traffic flow of this intersection is mixed traffic flow and both way is two way. In this study an attempts are made to investigate the geometric elements, traffic congestion, and traffic control devices at Traffic Mor road intersection.

Keywords— Traffic congestion, geometric elements, traffic volumes, PCU, Traffic control device.

I. INTRODUCTION

Today is time of speed. More speed on roads means more efficient and safe transportation system. Every road user desires to reach his destination safely, in shortest possible time and with least inconvenience [2]. Hence conditions should be created on the road which helps vehicles to achieve maximum speed. Speed, safety and least inconvenience are the three important factors which are to be kept in mind by every road designer [5]. For acquiring more speed, roads should remain visible to the drivers for quite long distances so that they may stop or slow down, as the case may be, before hitting any obstruction [3].

Different classes of vehicles such as cars, vans, buses, tracks, auto- rickshaw, motor cycles, by- cycles, bullock carts, etc. are found to use the common roadway facilities without segregation on most of the roads in developing countries like Bangladesh [8]. The flow of traffic with unrestricted mixing of different vehicle classes on the roadways forms the heterogeneous traffic flow or the mixed traffic flow [1].

The different vehicle classes have a wide range of static characteristics such as length, width, etc. and dynamic characteristics such as speed, acceleration, etc [7]. Apart from these, the driver behavior of the different vehicle classes is also found to vary considerably [6]. The mixed traffic flow like Motorized Traffic (MT) and Non Motorized Traffic (NMT) characteristics are very much complex when compared to homogeneous traffic consisting of passenger cars only [4].

With the development and rapid industrialization of the country various structures such as educational institutions, mills, factories and offices are established in Pabna. Every day people from rural area come in pabna city for office works, for business, for treatment and for other purposes. People from nearest towns and villages also come every day in pabna city for job, for education in college and University and for many other activities. People cannot come in city timely and cannot be back to home timely. Due to this problem people loss valuable time, money, energy, opportunity of job etc. As a result the population of Pabna city increases day by day which is make problem in city life. Out of different causes, traffic delay, traffic congestion and road accidents are the important problems due to bottleneck and improper traffic management. This problem can be controlled by the improvement of geometric parameters of the intersections and curves, introduce effective traffic control measures, banning of illegal parking and to improve the serviceability of the roads at road intersection. With the above requirements the present study can be taken to investigate the standards of geometric elements and traffic control system at major road intersection in Pabna city.

A. Study Area

Pabna is a town in Rajshahi Division of Bangladesh and the administrative capital of eponymous Pabna District. It is located on the north bank of Padma River. Pabna is a city having a population of 186,781 (2012, en. Wikipedia) and area of 18.64 sq km (en. bengaliwiki.com) and there are three major roads connecting with other districts.

Pabna is characterized as an important trade and manufacturing center of Bangladesh. The district lies under the zone of influence of the Rajshahi City which is one of the fast developing cities in the country. The district is dotted with many industrial units for its easy transportation linkages with other parts of the country. It also plays a vital role on food security for both Rajshahi and Pabna. Therefore, as part of Rajshahi Metropolitan Development Program (RMDP), a study of the secondary city adjacent to the city, bears a great importance. As such, Pabna City (presently Pabna Pourashava) is selected as the study area for this research (Figure 1).



Figure 1: Location of the Study Area (Pabna City)

II. OBJECTIVES OF THE STUDY

The objectives of this study are as follows:

- a) To investigate the geometric elements.
- b) To investigate the traffic congestion.
- c) To determine the remedial measures to reduce this traffic congestion.

III. GEOMETRIC ELEMENTS AT TRAFFIC MOR

All road intersection which meet at about the same level allowing traffic maneuvers like merging, diverging, crossing, and waving are called intersections at grade. The basic requirements of intersection at grade are given below.

- (i) At the intersection the area of conflict should be as small as possible.
- (ii) The relative speed and particularly the angle of approach of vehicle should be small.

- (iii) Adequate visibility should be available for vehicles approaching the intersection.
- (iv) Sudden change of path should be avoided.
- (v) Geometric features like turning radius and width of pavement should be adequately provided.
- (vi) Proper sign should be provided on the road approaching intersection to warn the drivers.
- (vii) Good lighting at night is desirable.

Traffic congestion, unnecessary delay and accident at intersection are partially affected by the geometric elements at intersection. The geometric elements that affect the free flow at intersection are discussed below.

For the sake of proper investigation four branch road meeting at the Traffic Mor road intersection are designated as

- Branch road 1: Intersection to Hospital road.
- Branch road 2: Intersection to College road.
- Branch road 3: Intersection to Abdul Hamid road.

TABLE I
Geometric elements of traffic mor.

Road	Branch road 1	Branch road 2	Branch road 3
Friction	70-80%	60-70%	70-80%
Pavement unevenness	Even	Even	Even
Light Reflecting Characteristics	Not Good	Good	Not Good
Cross Slope	1 in 45	1 in 50	1 in 50
Carriageway	9 m	15	9.5 m
Traffic Separator	Absent	Absent	Absent
Kerb	Present	Present	Present
Road Margin (Footpath)	Present in both sides	Present in both	Present in both sides
Right of Way	10 m	20 m	10 m

Different classes of vehicles such as bus, truck, rickshaw, van, bicycles, car, auto rickshaw, pickup, motorcycle, hand-cart etc. are found to use the common roadway facilities without segregation on most of the roads in developing countries like Bangladesh.

The Traffic Mor road intersection is also among them. The flow of traffic with unrestricted mixing of different vehicle classes on the roadways forms the heterogeneous traffic flow or the mixed traffic flow. The Traffic Mor road intersection consists of mixed traffic flow. The different vehicle classes have a wide range of static characteristic such as length, width etc. and dynamic characteristic such as speed, acceleration, etc. Apart from these, the driver behavior of the different vehicle classes is also found vary considerably. Therefore the mixed traffic flow characteristic are very much complex when compared to homogeneous traffic consisting of passenger cars only. The types of traffic movement in the intersection are summarized in the figure below.

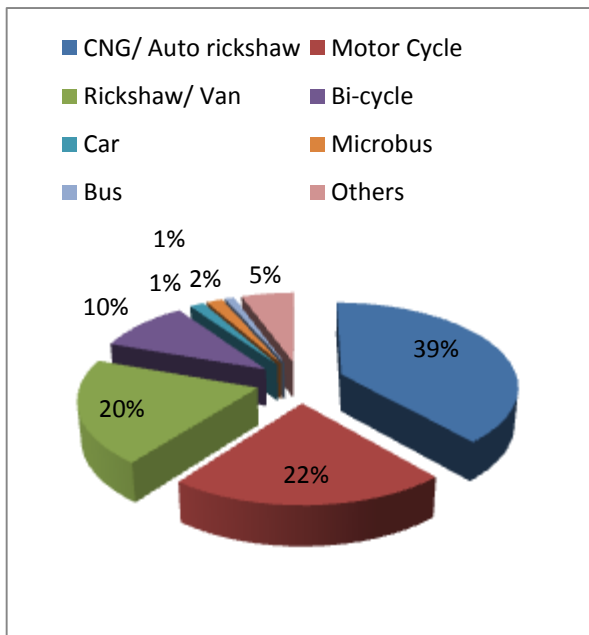


Figure 2: Traffic volume at intersection

Source: Unpublished thesis paper “Solid Waste Generation in Paban” by S. Sharmin, (Undergraduate student, Department of Civil Engineering, PSTU)

The maximum traffic volume at the intersection is summarized in the figure below.

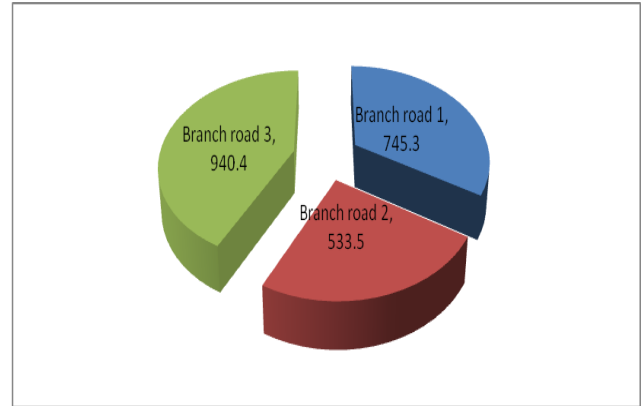


Figure 3: The maximum Traffic volume at the Traffic Mor intersection.

Source: Unpublished thesis paper “Solid Waste Generation in Paban” by S. Sharmin, (Undergraduate student, Department of Civil Engineering, PSTU)

VII. FINDING OF THE STUDY

The geometric elements of the intersection are quite sufficient for the traffic movement of the intersection without any congestion, but every day the intersection suffers from congestions, people lose their valuable time because of the congestions. The reasons for traffic congestions are summarized below,

- Illegal CNG and Auto-rickshaw stand before the intersection
- Illegal and unauthorized shops at the footpath and even on the roads.
- Lack proper facilities for people in footpath.
- Improper traffic management by the traffic police.
- Illegal entry of the vehicles at intersection.
- Lack of parking place at the intersection.
- Poor maintenance.

The problems can be solved by widen the road, but it is very costly. The following steps can be taken to reduce the traffic congestions,

- Illegal parking should be strictly prohibited.
- Shops at footpath and on the road should be shifted.
- Proper footpath should be created.



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- ❑ Street lights should be increased at the intersection for the improvement of the night visibility.
- ❑ Parking place should be created at some distance from the intersection.
- ❑ Traffic police should be present all the time at the intersection.
- ❑ Billboards from the road corner should be removed to increase the sight distance.

VIII. CONCLUSION

Managing the traffic flow is the way to secure the traffic movement. Pabna is the rising city consisting of major educational and industrial institution. As a result recently the population in the city rose. Existing city road network is not adequate for the increasing traffic volume. There are so many road intersections in Pabna city road network. Maximum conflict points are generated in this intersection. There are no separate lane for slow moving vehicle as a result the problems like traffic congestion as well as delay and road accidents are occurred at the major road intersection in Pabna city. A proper traffic flow only can be ensured by the participation of both the inhabitants and the proper authority. Everyone has a lot of demand but there are many limitations. A traffic management plan should be consider the issues which are major needs of near future.

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