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Application of Traffic Management Plan a Sustainable Solution of Traffic Congestions in Pabna City, Bangladesh

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Abstract— Pabna, one of the rising cities in Bangladesh, as a result the population in Pabna increasing day by day along with the traffic congestion. Traffic management plan is one of the best policies to solving the traffic congestion in developing countries like Bangladesh. 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 traffic management. The traffic management plan has the scope of improvement of the existing road network and system and plan proposal for new development.

Keywords— Traffic Management, Congestions, Traffic volume, Sustainable, Geometric survey, Road side interview survey.

I. INTRODUCTION

Transportation system directs the urban development pattern. The performance of transportation system largely influences the economy and social progress of an area. It provides the mobility to the people, goods and services to their destination. But the population growth and increasing number of vehicles, creating traffic congestions.

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. As result of traffic congestion, people loss valuable time, money, energy, opportunity of job etc.

Various attempts were taken by previous governments including special meeting with the agencies concerned to devise means to help reduce the intensity of traffic problem in Pabna city.

Some tangible improvements were assured within the shortest possible time. But, in fact nothing has happened with the traffic police remaining indifferent, in many cases, to their usual duty. The drivers of buses and trucks and the rickshaw-pullers continue to be as defiant as before. This problem can be controlled by the improvement of the existing road network and proper traffic facilities for urban dwellers. Traffic management plan ensure the mobility to the whole city. Future development and infrastructure are related with traffic management. Traffic management plan also help to develop existing networks.

A. Study Area

Pabna is one of the major towns in Rajshahi Division of Bangladesh and the administrative capital of eponymous Pabna District. It plays a major role in connecting the northern and southern parts of the country, with the capital Dhaka city. It is located on the north bank of Padma River. Location of Pabna is 24.99°N and 89.23°E. Paban consists of 15 wards and 34 mahallas. Population Density of the area is 6243 per sq km. 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)

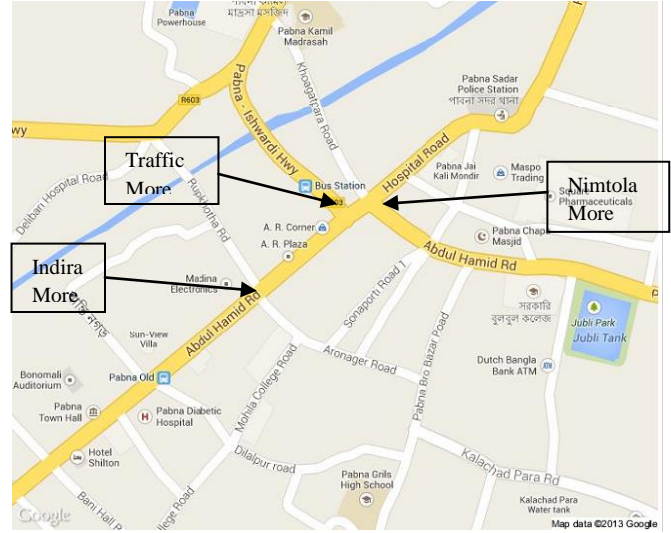


Figure 2: Location of the Intersections

B. Objectives of the Study

The objectives of this study are as follows:

- a) To investigate the geometric elements of the major intersection.
- b) To investigate the traffic volume in major intersection.
- c) To propose transport management system to reduce traffic congestions.

II. METHODOLOGY

In order to fulfill our demands, we worked on three different processes to complete a sustainable traffic management plan of Pabna city. These are given below.

- a) Geometric survey.
- b) Traffic volume survey.
- c) Road side interview survey.

We worked on three major intersections.

- 1) Traffic More
- 2) Nimtola More
- 3) Indira More

A. Geometric survey

Traffic congestion, unnecessary delay and accident at road intersections are partially affected by the geometric elements at intersection. The geometric elements affect the free flow at intersection. The basic geometric requirements of intersection at grade are given below.

- At the intersection the area of conflict should be as small as possible.
- The relative speed and particularly the angle of approach of vehicle should be small.
- Adequate visibility should be available for vehicles approaching the intersection.
- Sudden change of path should be avoided.
- Geometric features like turning radius and width of pavement should be adequately provided.

B. Traffic volume survey

- Traffic volume can be defined as the number of vehicle passing through a section of road per unit time.
- We observed the traffic volume during the peak hours.
- Traffic volume reflects the importance of road for improvement and expunction.

III. FINDINGS OF THE SURVEY

The findings of the survey results are summarized below.

A. Geometric Survey

Table 1
Geometric Elements of the Intersection

SL	Intersection Name	Route Name	Width of Carriage Way (meter)
1	Indira More	Abdul Hamid Road (Towards Hospital)	11
		Abdul Hamid Road (Towards Town hall)	11
		Awrangozeb Road	6.5
		Rupkatha Road	4
2	Nimtola More	Abdul Hamid Road (Towards Hospital)	9.5
		Abdul Hamid Road (Towards Town hall)	9.5
		Abdul Hamid Road (Towards Bulbul college)	5.5
		Khoaghatpara Road	4
3	Traffic More	Abdul Hamid Road (Towards Hospital)	9.5
		Abdul Hamid Road (Towards Town hall)	9
		Paban Ishwardy highway	15

B. Traffic volume survey

The traffic volumes are calculated at different hours at the intersection. The peak hour Passenger Car Unit values are summarized below.

Table 2
Traffic volume survey at Indira More

Sl	Route Name	Peak Hour PCU
1	Abdul Hamid Road (Towards Hospital)	1235
2	Abdul Hamid Road (Towards Town hall)	1220
3	Awrangozeb Road	746
4	Rupkatha Road	635

Table 3
Traffic volume survey at Nimtola More

Sl	Route Name	Peak Hour PCU
1	Abdul Hamid Road (Towards Hospital)	912
2	Abdul Hamid Road (Towards Town hall)	719
3	Abdul Hamid Road (Towards Bulbul college)	746
4	Khoaghatpara Road	635

Table 2
Traffic volume survey at Traffic More

Sl	Route Name	Peak Hour PCU
1	Abdul Hamid Road (Towards Hospital)	940
2	Abdul Hamid Road (Towards Town hall)	747
3	Paban Ishwardy highway	560

The types of traffic movement in the intersection are summarized in the figure below.

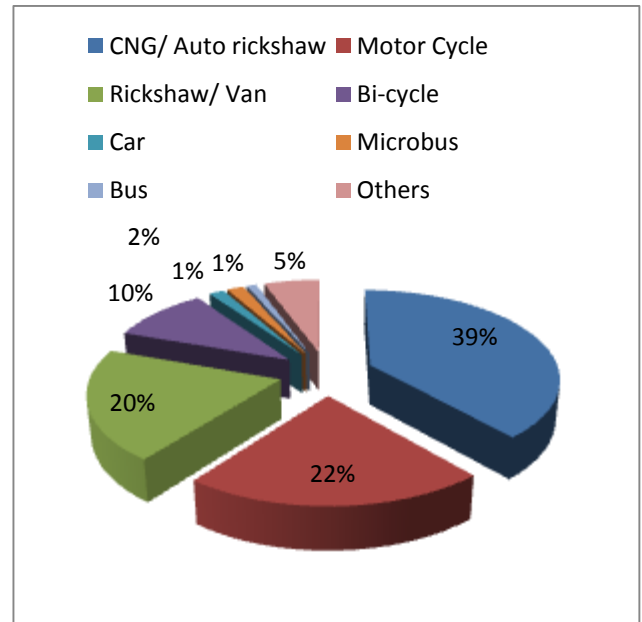


Figure 3: Various classes of vehicles at intersection

IV. PROPOSALS FOR TRAFFIC MANAGEMENT

Pabna is one of the oldest cities in Bangladesh. Pabna contains Edward College, Medical College Hospital, Mental Hospital, Pabna University of Science and Technology and many other institution and Industrial plants. Because of this institutions peoples from various part of the country are coming to Pabna and the population is rising day by day. Due to increase in population another problem raised, which is traffic congestion. Pabna is an old city there are lots of high rise buildings near the roads. For the widening the road the road side buildings have to be demolished, but it is very difficult as the owners are not interested at any cost. This problem can only be solved by proper traffic management.

To reduce the traffic congestions, five check posts can be made around the intersection with the help of Traffic Police. The following instruction can be carried out by the Traffic Police.

- a. Public transport like auto rickshaw and CNG should not allow crossing the check posts.
- b. Heavy vehicles like bus truck should not allow crossing the check posts.
- c. Right turning of all the vehicles at check post 3 should be prohibited.
- d. All the road side roads near the three intersections and the five check post should be relocated.
- e. Traffic police should always present at the intersection and check posts.
- f. Speed breakers can be applied at the check post to reduce the speed of the vehicles.
- g. Illegal parking near the three intersections should be strictly prohibited.
- h. To increase the sight distance the bill boards at these three intersections should be removed.

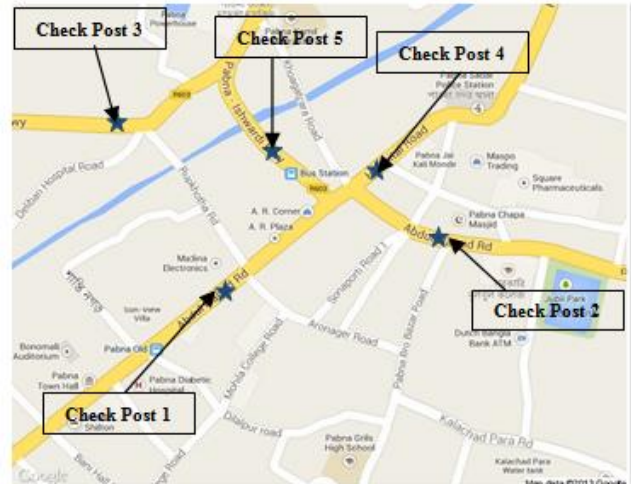


Figure 4: Location of the check posts

V. CONCLUSION

Traffic Management Plan show the ways by which a secure traffic can conducted. A proper traffic flow management only can ensure by the participation of both the inhabitants and the proper authority. Everyone has a lot of demand but there are, many limitation. A Traffic Management plan should be consider the issue which can be major needs of near future. A developing country like Bangladesh needs a good transportation system for the growth of the country. As we could not spend much money on constructing new roads and shifting the existing infrastructure, a proper Traffic Management plans can serves us a lot. Pabna is one of the growing cities of country. A successful application of the traffic management plan in Pabna can be example for the other cities of Bangladesh.



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