

Traffic Management Plan for Pabna Pourashava in Bangladesh

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Abstract

Traffic congestion is a common scenario almost all the urban area of Bangladesh. The unplanned combination of rapid urbanization and motorization has been a key cause of traffic congestion. It brings unnecessary time loss and suffering of the urban inhabitants. So it is badly needed to prepare a transportation management plan to solve the associated problems. This paper tried to investigate the present traffic management System in Pabna Pourashava area. To evaluate the observance of road, its geometrical characteristics and Level of Services (LOS) have been analyzed depending on the data collected through field surveys. This paper outlines the amount of traffic congestion in Pabna Pourashava, the present scenario of traffic management system with their drawbacks and finally suggests some options for traffic management of Pabna Pourashava which are planning for safe traffic control system and effective traffic movement.

Keywords: Traffic Management, LOS, Traffic Control Device, PCU, Pabna Pourashava.

1 Introduction

The growth of traffic congestion in the road network of cities in developing countries, like Bangladesh, is a serious concern from the planning point of view. The traffic congestion at the intersection is most crucial because the performance of intersection affects the performance and productivity of the whole road network most significantly (Ahmed et al, 2016). 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. The traffic management plan has the scope of improvement of the existing road network and system and plan proposal for new development. Pabna, one of the rising cities in Bangladesh, as a result the population in Pabna increasing day by day along with the traffic congestion. With the development and rapid industrialization of the Pourashava various structures such as educational institutions, mills, factories and offices are established in Pabna. Every day people from rural area come in Pabna Pourashava for office works, business, treatment and other purposes. People from nearest towns and villages also come every day in Pabna Pourashava for job, education in college and University and for many other activities (Saha et al, 2013). To overcome this situation there is need for planning, designing and implementation of a comprehensive work plan for the improvement of existing road network, parking system along with activities to reduce traffic congestion. In this context this study focuses on overall traffic management scenario of Pabna Pourashava for help to develop existing networks to reduce traffic congestion.

1.1 Objectives

- To investigate the traffic volume in major intersection.
- To propose some appropriate measures for ensuring unimpeded traffic flow.

1.2 Study area

Pabna is one of the major towns in Rajshahi Division of Bangladesh. Location of Pabna is 24.99° N and 89.23° E. Pabna consists of 15 wards and 34 mahallas. Population Density of the area is 6243 per sq km. Pabna Pourashava is having a population of 186,781 (2012, en.Wiki) and area of 18.64 sq km (en. bengaliwiki.com). As such, Pabna Pourashava (presently Pabna Pourashava) is selected as the study area for this paper.

2 Methodology

The methodology describes the procedures to organize the scattered ideas and views to conduct the study. To find out nature of traffic flow Geometric survey, Traffic volume survey, Road side interview survey, Household Interview survey (HIS) are conveyed. Traffic volume survey are conducted on five major intersections such as Traffic More, Nimtola More, Indira More, Pachmatha More, Doi Bazar More and HIS survey on 15 wards in Pabna Pourashava. Secondary data are collecting from traffic police department, Pourashava Authority, newspaper, journals and websites and conducted proper analysis of all data.

3 Data analysis of the survey

3.1 Geometric Survey

Intersection geometric design involves the proportioning of the visible elements of highway facilities. It includes the design of horizontal alignment, vertical alignment and cross section elements such as shoulder, curb, pedestrian facility etc. The findings of the survey results are summarized below.

Table 1. Geometric Elements of the Intersection

SL	Intersection Name	Route Name	Width of Carriage way (meter)
01	Indira More	Abdul Hamid Road (Towards Hospital)	11
		Abdul Hamid Road (Towards Town hall)	11
		Awranogzeb Road	6.5
		Rupkatha Road	4
02	Traffic More	Abdul Hamid Road (Towards Hospital)	9.5
		Abdul Hamid Road (Towards Town hall)	9
		Pabna-Ishwardy highway	15
03	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
04	Pachmatha More	Atikula Road (To Bulbul college)	4
		Square Road	3.8
		BeneyaPotti Road	2.5
05	Doi Bazar More	Boro Bazar Road (Towards Girls school)	4
		Boro Bazar Road (Towards Pachbibbi mosque)	4
		BeneyaPotti (Towards New Market)	3.8

Source: Field survey, 2016

3.2 Traffic volume survey with existing problems

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

Table 2. Level of Service and existing problems are showed at major intersections.

Intersection Name	Route Name	Peak Hour Passenger Car Unit (PCU) (V)	Capacity (C)	Peak Hour (V/C)	Level of Service (LOS)	Existing Problems
Indira More	Abdul Hamid Road (Towards Hospital)	2092	6050	0.35	B	-No parking space - Footpath is used illegally
	Abdul Hamid Road (Towards Town hall)	2220	6050	0.37	B	- Temporary auto stand creates traffic congestion
	Awranagozeb Road	1728	3575	0.48	B	- Encroachment by hawkers and vendors
	Rupkatha Road	835	2200	0.38	B	
Traffic More	Abdul Hamid Road (Towards Hospital)	1976	5225	0.38	B	- Encroachment of footpath by vegetable markets in the afternoon
	Abdul Hamid Road (Towards Town hall)	1680	4950	0.34	B	- Encroachment of footpath
	Pabna-Ishwardy highway	3246	8250	0.39	B	- No speed breaker
Nimtola More	Abdul Hamid Road (Towards Hospital)	1835	5225	0.35	B	- Temporary auto rickshaw Stand
	Abdul Hamid Road (Towards Town hall)	2465	5225	0.47	B	- Encroachment of footpath by vegetable markets in the afternoon
	Abdul Hamid Road (Towards Bulbul college)	2040	3025	0.68	C	- Temporary auto stand - Narrow road
	Khoaghatpara Road	623	2200	0.28	A	
Pachmatha More	Atikula Road (To Bulbul college)	1183	2200	0.54	B	-Narrow road - No footpath
	Square Road	762	2090	0.36	B	- No footpath
	Atikula Road (Towards Nimtola More)	1154	2200	0.52	C	-Narrow road - No footpath
	BeneyaPotti Road	4232	1375	0.31	A	- Narrow road
Doi Bazar More	Boro Bazar Road (Towards Girls school)	892	2200	0.41	B	-No parking space - Footpath is used illegally
	Boro Bazar Road (Towards Pachbibim mosque)	820	2200	0.37	B	-Footpath is used illegally
	BeneyaPotti (Towards New Market)	920	2090	0.44	B	- Narrow road

Source: Field survey, 2016

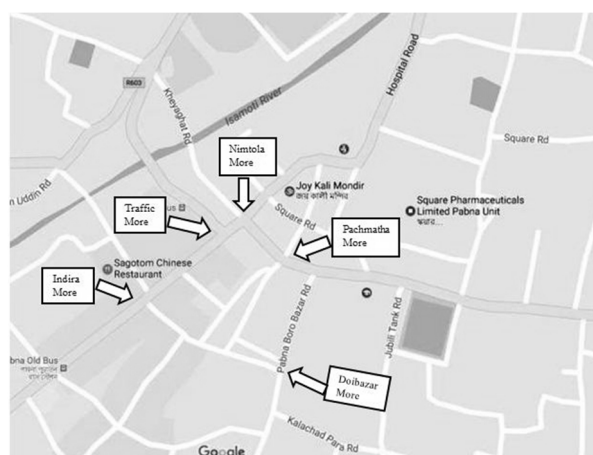


Figure 1. Major intersections of Pabna Pourashava

3.3 Trips generation and attraction points

List of Registered vehicles is a good source of getting hint of the vehicles operating on any site. However, many other vehicles also operate in the Pabna Pourashava registered elsewhere and vice versa. Thus, vehicle numbered on major intersection provide valuable information about the mode of traffic on that site. The following table shows vehicles both motorized and non-motorized in the Pabna Pourashava according to volume count survey in the Pourashava.

Table 3. External-Internal trips generation and attraction points.

Mode	Indira More (%)	Traffic More (%)	Nimtola More (%)	Pachmatha More (%)	Doi Bazar More (%)	Average (%)
Bi-cycle	26	35	27	29	23	28
Rickshaw	52	40	35	35	29	39
Motor-cycle	18	17	13	12	8	14
Auto-rickshaw	60	72	70	31	42	55
Car/Micro-bus	2	3	2	10	3	4
Truck	1	2	18	7	2	6
Bus	1	1	3	3	0	2
Animal Cart	1	0	2	3	1	2

Source: Field survey, 2016

The traffic composition illustrates that both passenger and freight vehicles visit frequently Pabna Pourashava area. The modal share for auto-rickshaw and rickshaw is highest. However, average bi-cycle share is also mentionable (28%).

3.4 Origin and Destination (O-D) survey

Origin and destination (O and D) studies are most indispensable in planning new road facilities and in improving some of the existing system. This study is most essential for solving zonal as well as regional traffic problems.

Table 4. O-D matrix in the study area

Origin in different zones	Destination in different zones															Total trips generation
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Ward 10	Ward 11	Ward 12	Ward 13	Ward 14	Ward 15	
Ward 1	25	69	21	7	7	8	22	7	3	10	—	5	15	19	15	233
Ward 2	51	130	83	35	32	10	18	49	31	23	84	—	58	8	6	618
Ward 3	13	91	6	11	12	16	64	4	27	16	105	2	11	9	13	400
Ward 4	11	34	19	4	14	10	—	16	8	6	21	—	2	1	2	337
Ward 5	—	33	29	17	36	9	11	9	4	9	21	—	2	2	2	184
Ward 6	4	11	15	9	6	12	23	3	8	8	12	—	3	4	3	131
Ward 7	8	17	60	15	10	24	—	3	6	13	2	—	18	3	1	180
Ward 8	1	50	7	12	13	4	2	20	4	20	12	1	2	4	5	157
Ward 9	5	29	23	5	6	8	45	3	25	38	23	—	1	7	1	189
Ward 10	24	20	14	5	9	9	9	—	38	12	3	1	9	10	10	173
Ward 11	—	33	78	13	11	4	5	10	12	27	29	2	9	—	—	233
Ward 12	69	27	—	10	9	2	3	2	24	8	—	—	1	—	—	155
Ward 13	13	58	11	2	2	3	18	1	1	9	10	—	4	6	—	138
Ward 14	14	8	9	1	1	6	3	1	7	11	1	1	42	37	64	176
Ward 15	15	6	13	2	2	2	4	1	1	10	—	—	2	1	62	131
Total trips attraction	160	662	415	138	171	134	226	150	177	220	419	11	177	110	183	

Source: Field survey, 2016

4 Proposals

To minimize the traffic congestions, four 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. Traffic police should always present at the check post.
- b. Public transport like auto rickshaw and CNG should not allow crossing the check posts.
- c. Heavy vehicles like bus truck should not allow crossing the check posts during the time between 8 am to 8 pm.
- d. Speed breakers can be applied to reduce the speed of the vehicles.
- e. Illegal parking near the three intersections should be strictly prohibited.

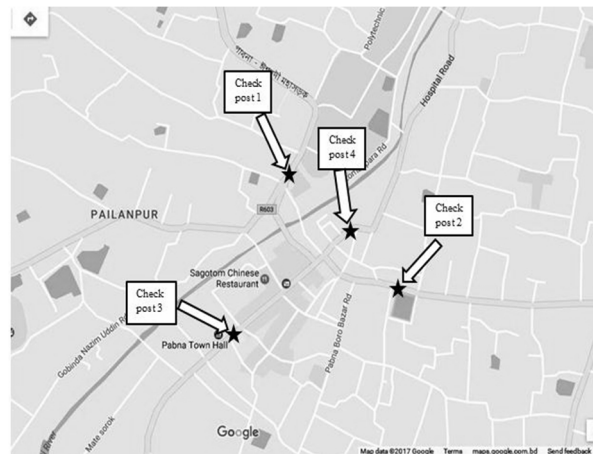


Figure 2. Location of the check posts.

5 Conclusions

Traffic congestion is a global as well as local problem. All over the world, the prime cause of traffic congestion is on street parking (Naznin et al, 2010). In Bangladesh, traffic congestion is a common issue in the Pourashava along with big cities. At present traffic flow improvement is a conclusive subject around the world. Traffic flow improvements represent those actions that can be accomplished to enhance the person-carrying capability of the roadway system, without attached significantly to the width of the roadway. The study findings gave the dimension to the fact that traffic congestion is going to be a serious problem for Pabna Pourashava. Traffic congestion is increasing day by day due to inappropriate intersection geometric design, inadequate transport facilities and ineffective traffic management system. For Pabna Pourashava, traffic congestion constraints can be ameliorated by embarking on various strategies such as road capacity expansion, improved road infrastructures, restricting routes for Rickshaw, financial penalty to the traffic law breakers, building bus stoppages. Most importantly, proper traffic management system along with appropriate implementation of traffic rules is necessary to mitigate the problems of traffic congestion (Shamsher et al, 2013).

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