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A Study on Travel Demand Management to Reduce Congestion in Dhaka City

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ABSTRACT: This paper aims to investigate Transportation Demand Management techniques to reduce the traffic congestion at Dhaka City, the capital of Bangladesh. Now a day, because of the deadly congestion Travel demand management (TDM) has come out as a policy choice for solving transportation and traffic congestion problems by reducing and restricting travel demand instead of supply management techniques. A total of 206 responses have been taken from road users of Dhaka city. An opinion was taken regarding demand management strategies. Moreover, photographic survey has been done to present existing conditions and provide suggestion for future. Some important steps were identified which can be helpful to mitigate the present road traffic condition of the city.

KEYWORDS: Travel Demand Management, Congestion.

I. INTRODUCTION

Over the last few years the traffic condition of Dhaka city has visibly been deteriorating steadily. Citizens constantly complain about the unbearable problems of traffic condition which suffers the city people as well as city's economic condition. According to a World Bank report, in the last 10 years, the average traffic speed in Dhaka has dropped from 21 kilometres per hour Kmph to 7 Kmph, and by 2035, the speed might drop to 4 kmph, which is slower than the walking speed. Another study, commissioned by BRAC institute of Government and Development, says traffic congestion in Dhaka eats up around 8.16 million working hours every day and costs the country USD 11.4 billion every year. The traffic condition of Dhaka city has gone to dump with the presence of illegal and unfit vehicles, picking and dropping passengers in the middle of road, buses stopping beyond the designated bus stops. These are the major causes of traffic jam in the capital. Traffic jam of Dhaka city costs over Tk 96000 crores a year. According to the above traffic condition of Dhaka city and the miseries of suffering people, it has been analysed on how it can be reduced. Congestion, delay and pollutions are regular consequences if existing transportation system fails to maintain satisfactory level of people. (Alam & Habib, 2003).

Now-a-days, it has been observed that Travel Demand Management only reduce congestion to a large extent but also imparts a lot to mobility, cost reduction and reduce pollution also. Conventional transport planning tends to focus on a limited set of objectives, and so often overlooks some of these benefits. So, TDM policies are beneficial for both transportation and environmental agencies as well as helpful for consumers regarding safety and cost savings issues. (T. Litman, 2006)

II. LITERATURE REVIEW

Now-a-days, traditional "Supply-side" management is not effective as much as Demand management. More emphasis on demand management is helpful to reduce transportation related problems. (Behnke, 1996; Beroldo, 1990; VTPI, 2005a). With the growth of population and increased number of vehicles travel pattern in most of the countries of the world has been reshaped. So, TDM is like a policy choice to reduce congestion by reducing or restricting or modifying traffic demand. (Giuliano & Wachs, 1992). Transportation Demand Management emphasise on improving roadway capacity by consuming less roadway space and shift travel by inefficient modes to off-peak period for reducing congestion. TDM measures can be categorized as soft and hard policies. Toll collection, congestion pricing, imposing parking charges are considered as hard policies. (Tuan Seik, 2000), Priority lane for SOV's, modification of school and workplace travel pattern, awareness programmes are while workplace and school travel plans, awareness campaigns are soft policies (Gärlling & Fujii, 2009; Steg & Vlek, 1997). The implementations of these policies have indicated significant results in different parts of the world in reducing private vehicle trips. Many studies in the developed world indicate that the effectiveness, acceptability and political feasibility of TDM policies depends on various factors



including individual characteristics such as norms and general intentions, environmental beliefs, problem awareness, willingness, perceived benefits and impacts of a measure (Beirão & Sarsfield Cabral, 2007; Bueno et al., 2017; Louise Eriksson, Nordlund, & Garvill, 2006). These factors vary across countries, societies, environments, and different age or ethnic groups. Thus far, very little research from the developing world has attempted to study these factors in the context of TDM. With regard to this, this paper provides investigations on traffic congestion problems in Dhaka and reduction by travel demand management.

III. METHODOLOGY

An important requirement for the implementation of any travel-demand management measure is that it should be both acceptable to the public and also capable of achieving its stated objectives (i.e. it must also be effective). Clearly, therefore, several important issues still need to be addressed; in terms of the relationship between the perceived effectiveness and public acceptance of alternative travel-demand management packages. The study has been based on Questionnaire Survey and Photographic Survey. This survey has been basically designed for collecting data. A total number of 206 people were assisted in survey by providing full information. Questions were asked about their opinion on traffic congestion and different policies that should be taken to reduce the congestion. Moreover, photographic evidence was taken regarding the road traffic condition of the city. Based on these two, some observations has been made.

IV. DATA ANALYSIS

Questionnaire was supplied to know the opinion of road users about some demand management measures to reduce congestion. It has been observed that, during morning and evening peak, along with other reasons mix-up of all types of vehicle such as NMV, private and public transport causes congestion, so, users were asked if it would be helpful to operate only public transport in peak hours. Fig 1 shows, responses of the users about restriction of Private transport in peak hours. 46% said it's a good idea and 35% said the idea is excellent. While 10% said that, the idea would not be an effective one. Moreover, it has been observed that, there is a competition attitude among the bus companies in Dhaka city that causes accidents and also make the roadway operation haphazard one. Opinion were taken from users that, if there is only one central bus company operated by Government, will it be helpful or beneficial? In Fig 2 it is observed that, 41% said the idea is excellent and 9% said it would not be helpful. In Dhaka city most of the roads are operated by traffic police. There is no effective traffic signal system in the roads. Now, it is highly necessary to implement the automatic traffic signal system. Fig 3 shows options about implementation of Automatic Traffic Signal. 95% said it should be implemented and 5% said it would not make a difference. Opinions were taken about banning on turning movements by providing different kinds of loops. Like-U loop, Q loop, G loops etc. Results are shown in Fig 4. Around 91% welcomed the idea and 9% said it would not be an effective one. Another problem in Dhaka city is no lane discipline. Motorized and Non-motorized vehicles move in same lane. As a result, motorized vehicle are unable to maintain their desired speed. If there is separate lane for NMV and BRT, confusions in road are reduced to a large extent. Fig 5 shows results regarding strict lane discipline. 61% said it must be maintained and would be effective, while 4% said it would not be a good idea. A question was asked about the implementation of several ideas. Users were notified about several options and asked is all or some of them can be implemented, if would be beneficial or not. Fig 6 shows, 46% said it would be excellent and 3% said the ideas are ineffective.

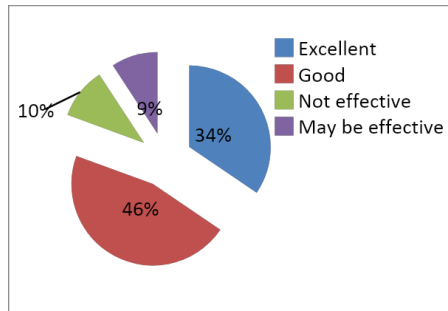


Fig 1: Opinion on peak hour restriction on private transport

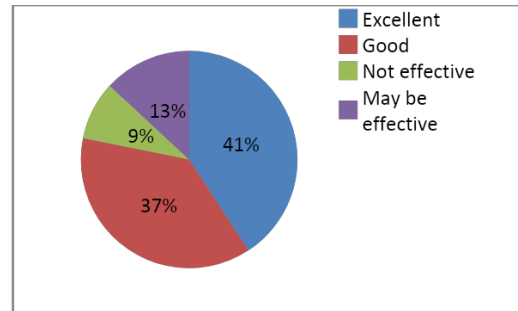


Fig 2: Opinion on one company city bus operated by Government

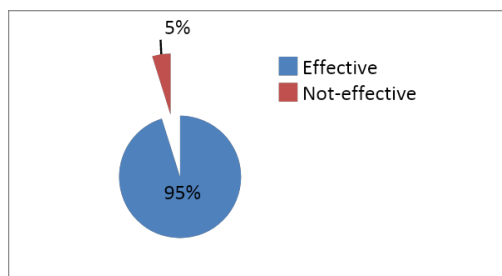


Fig 3: Automatic Traffic Signal Implementation

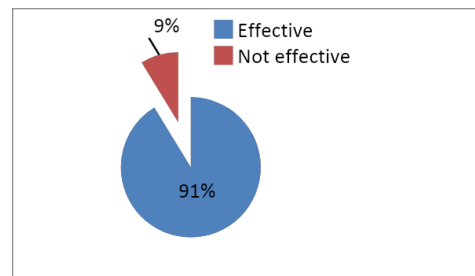


Fig 4: Banning turning movements by providing loops

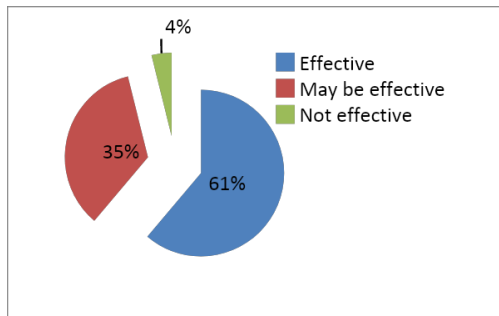


Fig 5: Strict lane discipline

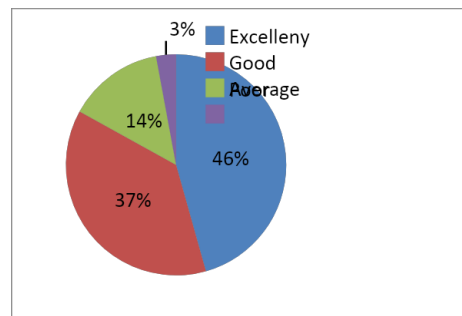


Fig 6: Response on implementation of different ideas

Apart from questionnaire survey, some photographic survey was done regarding the road traffic and geometrical condition of the Dhaka City. From the condition of the road it has been observed that, for Dhaka city along with many other problems, on-street parking is a big issue. Photo 1; show how parking is reducing roadway widths. Parking can be offered by paying money in certain vacant areas along the road. When everyone is unable to park on the road due to the fear of punishment, these parking zones may be helpful for parking their cars. Efficient road side management ensures the maximum width of road. As a result, the amount of overload cars and traffic jam on the road will be reduced. Photo 2 shows, computational attitudes between different company’s buses. If lane discipline can be maintained the discipline it will be certainly able to reduce traffic congestion and sufferings of people. It is very important to make awareness among all road users as soon as possible to get rid of chaotic condition of road. Photo 3 and photo 4 shows lack of lane discipline in road. The govt. and the city corporation should keep all footpaths free from all possessions; keep them clean regularly to encourage the use of footpath. Strict law enforcement is mandatory. Inefficient road side management also reduce effective road width shown in Photo 5. From survey, it is observed that, centralization of bus companies can reduce road traffic haphazard condition. Photo 3 and 4 shows, motorized and non-motorized vehicle on same road are making the situation complex one. Where signalized traffic system is possible to implement, it should at least be implemented there. And if that is not possible, then our mega city Dhaka will become a dead city at a certain time to think about “what can be done, what cannot be done.” With turning on the automatic traffic signal system, the traffic police could have engaged themselves in preventing any other road irregularities. So we need to adapt change over time. In Dhaka city in many cases, pedestrian don’t follow traffic rule and pedestrian cross the road without using



facilities for them. Photo 6, is a symbolic representation. All vehicles on the main roads of Dhaka city will be forced to maintain the lane firstly and then try to have an emergency lane with those lanes like photo 7. Then emergency services will be available for any urgent need. For that, it is required to reduce the Single Occupancy Vehicle in the capital and ensure adequate number of Higher Occupancy Vehicle that is public transport. Special restrictions should be imposed on the main roads at peak hours as soon as possible. The authority should move all bus stands/terminals & railway station situated in the city to any border area of Dhaka or to the departure point from Dhaka. To get rid of unfit public transports problem, govt. should select 2 or 3 operators who will operate the inter-city bus services and these operators will be responsible to the BRTC/BRTA for their each and every action. To get rid of inadequate parking facility problem, govt. should build public parking facility and control it properly and encourage the private firm to do some investment on it. In peak hour, female passengers have to face a lot of trouble In Dhaka city, alternate work schedule system is not fully implemented. But if implemented it can be effective for smooth traffic operation. Therefore, the govt. and the city corporation should implement it fully. Only then its full benefit can be realized.



Photo 1: Parking on road reducing road width



Photo 2: Computational attitude between different companies



Photo 3: No lane discipline



Photo 4: Mixed road traffic



Photo 5: Road side management

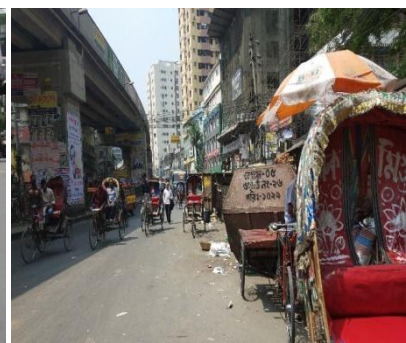


Photo 6: Pedestrian crossing road hapazardly



Photo 7: Emergency vehicle lane



Photo 8: Traffic congestion



V. CONCLUSION

From the analysis it can be said that, among the several demand management techniques peak hour restriction in private transport, centralization of bus company, alternative work schedule, automatic traffic signal, unsignalized loops, strict lane discipline, parking control on road, separate school bus, alternative work schedule, work from home can be effective. Special restrictions should be imposed on the main roads at peak hours as soon as possible. In peak hour, female passengers have to face a lot of trouble. To get rid of this problem, our govt. should take an exclusive intercity transport project for our women. The authority should move all bus stands/terminals & railway station situated in the city to any border area of Dhaka or to the departure point from Dhaka. It is very important to make awareness among all road users as soon as possible to get rid of chaotic condition of road.

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