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Challenges of Bus Rapid Transit (BRT) Project in Dhaka and Possible Overcomes

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***Abstract*—Dhaka is one of the largest mega cities in the world. It is the center of all administrative, business, commercial and cultural activities of Bangladesh. The rapid and unplanned developments over the past decades have created tremendous pressure on the transport system of the Greater Dhaka. However, over the last few years transportation problem has become much more severe. Dhaka metropolitan has a population of over 16 million, but the public transport services have pressed into service vehicles unfit for plying. There has not been much progress in improving the quality of public transport Services in Dhaka city. In this situation, Bus Rapid Transit (BRT) implementation would be very effective for, however, there are many challenges to overcome, such as, providing dedicated lanes from the existing congested road corridors. This study shows that if the challenges can be addressed, BRT system will be very effective to reduce traffic problems of Dhaka. For this research, a questionnaire is prepared and answers have been collected from experts and general people. Analysis has been done from the feedback of experts and general people to reach at a decision to overcome the challenges. Based on some hypotheses and feedback from people of Dhaka City, it is evident that if the basic challenges such as, making adequate land available and providing stations at proper intervals can make BRT network system very effective for Dhaka City.**

Keywords—Transportation; traffic; Dhaka; BRT

I. INTRODUCTION

Transport problem in Dhaka city is a getting worse for the city dwellers. Dhaka is fast becoming one of the largest cities in the world. From a population of 3 million in 1980 to 18 million in 2018, it is also one of the most congested cities in the world[4]. By 2020, the megacity's population is expected to rise to 22 - 25 million. Unplanned and uncontrolled growth has created unprecedented congestions. The average driving speed has dropped from 21km per hour 10 years ago to less than 7km per hour today[4]. Continuing on current trends would result in a further slowdown to 4km an hour which is slower than the average walking speed. This rapid population growth together with the limited space available for new transport infrastructure will further aggravate the heavy congestion in Dhaka. Bangladesh already has one of the highest traffic fatality rates in the world. Upgrading transport services for more efficient use of limited space is therefore critical for ensuring people's mobility, improving their quality of life, and boosting economic growth. The transportation system of Dhaka is predominantly road based and non-motorized transportation (mainly rickshaws) has a substantial share. Dhaka's road network is nearly 3000 km (of which 200 km primary, 110 km secondary, 50 km feeder and 2640 km narrow roads) with few alternative connector roads and it represents the proportion of road surface to built-up area hardly 7% as against 25% recommended for a good city planning. Only 400 km footpath is available for pedestrian of which 40% are being occupied illegally by vendors and others. There are no effective bi-cycle lanes and safe walkways even [5].

II. MAJOR TRAFFIC PROBLEMS OF DHAKA CITY

At present Dhaka consists 1868 km of paved roads which is not preventing congestion due to some factors such as,

- Most of the traffic flow has become one-way meaning at morning the total flow is towards North and Southl and in return hour it's towards West which is creating tidal flow at the roadway.
- Another major problem is that the lack of use of public transportation rather that private ones.
- Lack of available public transportation facilities with respect to the population.
- The roadway pattern is almost a linear pattern causing all the traffic flows from the collector roads to the main arterial roads.
- Our roadway utilities such as signals, signs are still manually done creating a significant amount of time loss on the junctions causing congestions.
- All the office, mills & factories, schools, colleges & university are at the heart of the city causing immense pressure on the roadway system.
- Last but not the least public awareness of the system and lack of roadway education for the drivers and passenger causing extra pressure on the existing system.

III. PLANNING OF BRT

Bus Rapid Transit (BRT) has increasingly become an attractive urban transit alternative in many Asian cities due to its cost-effective and flexible implementation [1]. Bus Rapid Transit (BRT) is a term applied to a variety of public transportation systems using buses to provide faster, more efficient service than an ordinary bus system. The government is going to introduce a Bus Rapid Transit (BRT) system to ease traffic congestions on the 20-kilometre Gazipur-Airport road. The Executive Committee of the National Economic Council (ECNEC) approved the Tk. 2,040-crore Greater Dhaka Sustainable Urban Transport project. The 4-year project also includes construction of 31 bus stops, a BRT depot, seven flyovers and a Bridge. Besides that, 50 buses would be procured under the project which would operate on the route[5]. The project, alongside the works of Metro Rail, has already been started as per the Strategic Transport Plans (STP), which designed for 20 years had been approved in 2008. Under the

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BRT project, three development agencies, including the Asian Development Bank, will provide a loan of Tk 1,6510 million. According to the project proposal submitted in 2005 under the STP, a study had been conducted with assistance from the World Bank[5]. The Strategic Transport Plan (STP, 2005) prepared and revised by Dhaka Transport Coordination Board (DTCB), serves as the current basis for urban transport planning in Dhaka. According to revised STP (2015), the World Bank in 2012 finished the feasibility study and basic design of the BRT Line 3 which runs from the Hazrat Shahjalal International Airport to Sadarghat. On the same vein, the Asian Development Bank (ADB) has already completed the basic design of the BRT Line 3 extension project which runs from the Airport to Gazipur[6]. STP underscores the large size of the transport investment needs in Dhaka and recommends a program that includes three Bus Rapid Transit (BRT) routes, three metro rail systems and fifty highway projects, including construction of a 29-km elevated expressway system, with a total investment of US$ 5.5 billion[5]. Recently approved Strategic Transport Plan (STP) for Dhaka city has suggested the development of six major corridors as mass transit routes as a means for achieving sustainable urban transport in the city and to ease the traffic congestion in the capital. The study recommended establishing mass rapid transit or metro rail in three corridors and BRT in the other three.

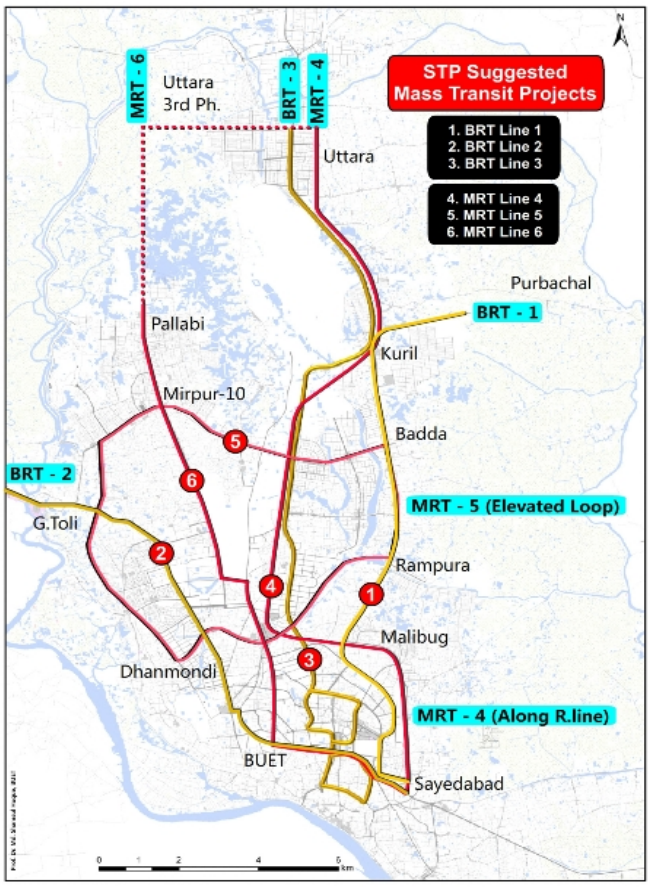

Fig. 1. Six Major Corridors as Mass Transit Routes [2].

IV. ANALYSIS AND DISCUSSION

For the research, some questions were prepared and answers were collected from around 50 respondents of various sectors including common people. From their feedback the following analyses have been done based on some hypothesis.

A. *Is it possible to dedicate prior lane for BRT?*

For BRT there should be a dedicated lane to provide faster, more efficient service than an ordinary bus system. Although a modern city should have 25 percent of its total area devoted to road use, Dhaka has only has 7 percent. Therefore, for implementation of BRT land acquisition would be a big challenge.

B. *Is BRT capable to integrate with other transport modes?*

Population of Bangladesh is growing day by day. To serve all the people it is very important to find innovative ways to integrate BRT with other transport modes as BRT requires high class traffic management system. Integrating BRT with MRT and traffic of minor roads is another great challenge.

C. *How the stations of BRT will serve the people?*

If BRT stations can be provided in intervals of shorter distance people will be benefited. In many cities, such as Ahmedabad in India, there are stations at about every 500 meter intervals. People may prefer stations in short distance interval but in Dhaka, it would be quite difficult to provide in congested corridors. In this scenario, stations interval should be neither longer nor shorter.

V. FACTORS RESPONSIBLE FOR THE FAILURE OF BRT IMPLEMENTATION

D. *Requirement of Wider Road*

As discussed in above, for BRT wider roads are necessary. BRT can be implemented in narrow roads but for this the mode of transport need to be homogeneous. But in Bangladesh there are heterogeneous traffic and in this case wider roads are needed to provide BRT Lanes. For a successful BRT implementation, the roads are required to be widened so that one prior lane can be dedicated for BRT service. According to the survey made on the basis of the answers of the respondents, 88.88% answered “yes” where 11.11% answered “No” for providing wider roads.

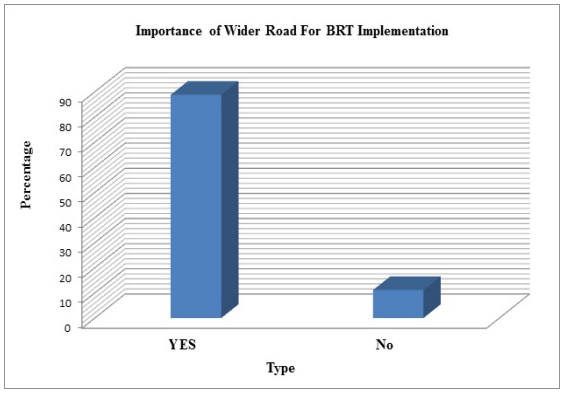

Fig. 2. Percentage of Respondent’s Answers for Wider Road.

E. *Lack of Possibility to Provide Station Facilities*

To make BRT planning system successful, it is necessary to provide all standard facilities in the stations. But from the perspective of current economical and social scenarios of Dhaka, it is quite difficult to provide all the facilities such as, facilities that support access for customers of all ages and abilities, facilities that support access for pedestrians and people using wheelchairs or bicycles, including providing bicycle parking, station platform(s), waiting shelters for all public transit routes serving the station, provision for short-

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term pick-up/drop-off of transit patrons by shuttle, taxi, etc. According to the survey made on the basis of the answers of the respondents, 55.55% answered "yes" where 44.44% answered "No" about the possibility to provide all station facilities. That is, majority of the respondents think that these challenges can be addressed.

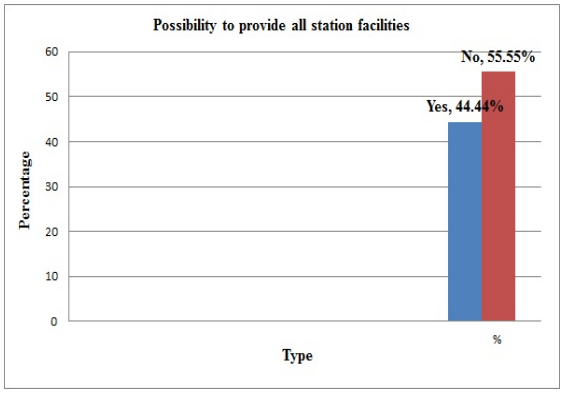

Fig. 3. Percentage of Respondents' Answers about the Possibility to Provide All Station Facilities.

F. *Non Acceptability with the use of Articulated Buses*

For BRT service, the use of articulated buses should be prioritized to serve maximum number of passengers. But in case of the road infrastructure of Dhaka city articulated buses are less favorite among the people. People mostly prefer double decker buses. According to the survey made and on the basis of the answers of the respondents, most favorite is "Imported double decker" buses for 44.44% respondent and "Imported articulated" are liked by 33.33% respondent, "Existing local bus" are chosen by 22.22% respondents.

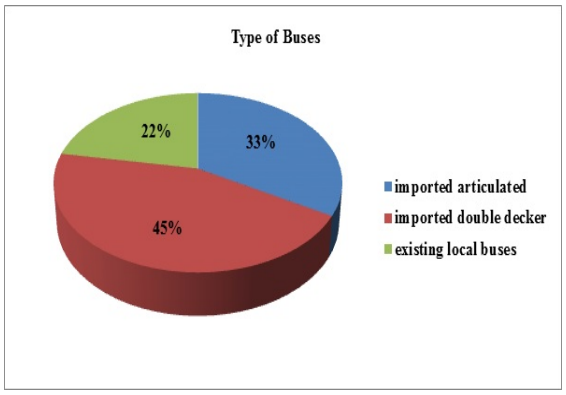

Fig. 4. Percentage of Respondents' Answers About Their Choice of Types of BRT Bus.

G. *Lacking in Capacity of Proposed BRT Corridors*

The proposed three BRT corridors are not enough to minimize congestion problem in Dhaka city. A correction may be needed so that poor transportation planning system can be improved to remove congestions. And for this BRT should be integrated with MRT and the Dhaka Transport Coordination Authority (DTCA) is working on it. From the survey answers, it is also clear that experts and general people also feel the same as 66.66% people said the proposed corridors are not enough to serve people where only 33.33% people think it is enough.

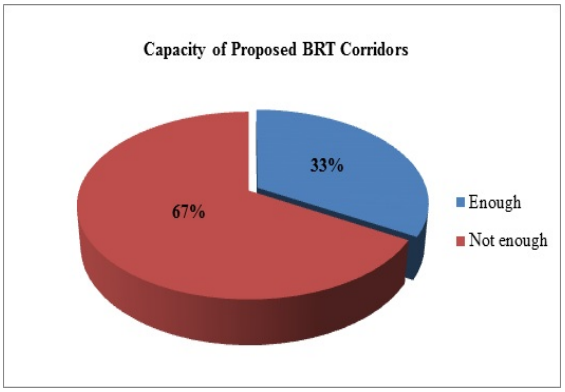

Fig. 5. Percentage of Respondents' Answers About Their Opinion on the Capacity of Proposed BRT Corridors.

H. *Major Factors Against the Success of BRT*

There are so many reasons which would be responsible for the failure of BRT implementation. Among them the political reasons, poor roadway condition, poor traffic system is the major factors against the success of BRT. But among these factors, the political reasons are the main factor which may cause the failure of BRT implementation planning according to the respondents.

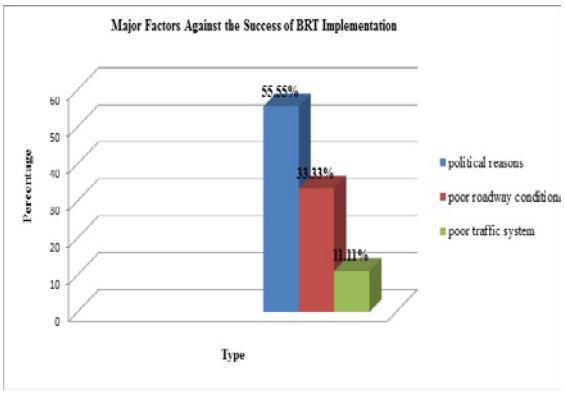

Fig. 6. Major Factors Against the Success of BRT Implementation.

By analyzing the entire hypothesis there is a clear understanding that BRT is such a project by which it is possible to improve the poor transportation planning system as BRT can serve a huge number of people at a time because of the capacity of buses. To make BRT successful it is very necessary to widen the existing roads and for these big budgets are required as the lands in Dhaka City are very expensive.

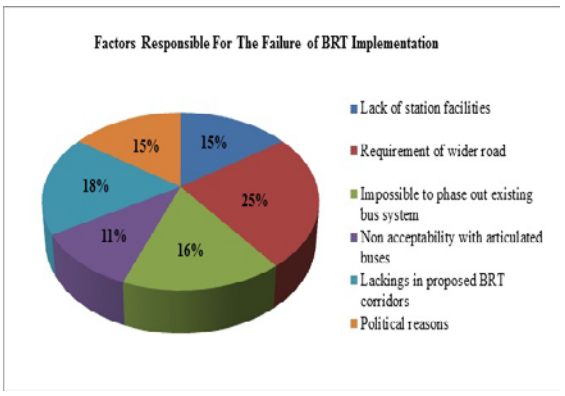

Fig. 7. Factors Responsible For the Failure of BRT Implementation.

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VI. CONCLUSION

Introduction of BRT and an improved transport system in the selected corridor will provide more comfortable travel and significant time savings for men and women. By separating buses from the irregularities of traffic and dramatically decreasing passenger load times, BRT can approach the same capacities and speed as costlier rail service. The Project will not only reduce poverty but also improve the people's prospects for a better life. But there are some challenges in the way of success in BRT implementation that have to be overcome. A project performance management system (PPMS) will have to be established and operated under the Project. The PPMS will be designed to support the data requirements of a fully integrated Result Based Monitoring (RBM) System. Using the RBM system will ensure that deviations between the project plan and achieved results (outputs, outcomes, and impacts) are recognized by project management in a timely manner, thereby allowing effective corrective actions and decisions. In order to pursue that, the consultants already conducted a reconnaissance visit to the entire corridor and identified the nature and types of impact that are likely to have due to implementation of the project. The survey covered the corridor of impact and the area that will be utilized directly and indirectly by the project.

VII. RECOMMENDATION

An experimental field test by running few buses for a certain period can be performed to get data about the accessibility of BRT from the road users and their positive-negative attitude about BRT. It is important to sort out view points of the passengers according to their knowledge about BRT and regular road usage behavior. On the other hand, Land acquisition along certain stretches is unavoidable. This includes both of Government and private lands. The land acquisition is a lengthy process and takes much time [4]. But it is the key path to overcome the problems of BRT implementation.

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