

IMPROVING ROAD TRAFFIC MANAGEMENT IN DHAKA CITY AND ITS ECONOMIC BENEFITS

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Introduction

Dhaka City is one of the largest and fastest growing cities in the world. With a reported population of over 14 million, its population is expected to rise to 22 - 25 million by 2020 (World Bank Report, 2010). Its population density as at 2013 was 115,000 people per square mile (Joel Koktrin, 2013). One of the most critical urban problems of Dhaka City involves transportation. The number of registered vehicles in Bangladesh increased from 22,381 in 1995 to 1, 343, 719 in 2009 (Nazrul, 2010). Being the fastest growing area in Bangladesh in terms of human population as well as automobile transportation, Dhaka has been unable to cope with the enormous demand that has been put on its existing road systems. The rate of increase in road infrastructure has not been commensurate with the rate of demand.

It has been observed that the density of the Dhaka City population, absence of satellite cities, industrial/commercial activities within Dhaka City and the uncontrolled increase in traffic have given rise to numerous transportation and traffic problems within the metropolis (Mozammel, 2014). Furthermore, the absence of a mass transit system, combined with inadequate or poorly executed development plans and encroachments on road space, poor road infrastructure, failure to adhere to traffic rules and regulations, etc, have contributed to traffic congestion (TC) in the City. These in turn have brought about many critical side effects such as; loss of valuable productive man hours, increased environmental pollution, increased wear and tear on vehicles, extra transport costs and health issues arising from stress and frustration among others.

All the observed effects of TC in Dhaka have had adverse effects on productivity. Study shows that because of TC, about 200 billion taka and 8.15 million working hours are wasted every year (Financial Express, 2013). This is despite several concerted effort by government to ease the problem of TC. Therefore, to obtain optimum output from the transportation sector in Dhaka, there is the need to review existing policies on TM in Dhaka City.

Since independence, Dhaka has been the hub of political, administrative and commercial activities in Bangladesh. This has given rise to rapid growth of its population. There have been several governmental efforts to address the issue of overpopulation, urbanisation and TM in Dhaka over the years. Similarly, government incorporated several urban and TM agencies for the responsibility of TM in Dhaka City (STP 2015). However, these agencies lack efficient, skilled and available manpower and this severely hampers their efficiency (STP 2015). Though the DTCA is the coordinating agency, all the organizations work towards similar goals and find it difficult to effectively coordinate and collaborate in their assignments. These greatly undermine collective efforts towards TM, thus adversely affecting the economic development of Dhaka City.

An assessment of road infrastructure in Dhaka City revealed that despite government intentions, road infrastructure in Dhaka City remains inadequate (Mamud et al, 2012). Generally, a city is expected to have at least 25 per cent road network of its total area, however Dhaka city road network is only 9-10 per cent of its total area. Out of this area, 30 per cent is occupied by hawkers, salesmen and roadside traders and shops. Overpopulation and urbanisation has led to the haphazard construction and expansion of the road network in the City. During the period of expansion of Dhaka City, little thought was given to the construction of an urban mass transit system like the monorail system. Furthermore, some of the over 1800 km of road network around Dhaka (with over 1286km in the metropolis) were poorly designed (Mamud et al, 2012).

Factors Responsible for Traffic Congestion in Dhaka City

There are several factors that are responsible for TC in Dhaka City. They include increased traffic density and corresponding reduction in road capacity, railway crossings around Dhaka City, poor TM and enforcement, disobedience of traffic regulations, lack of education/enlightenment of road users and illegal parking. Others are, personal interest overriding government intentions, poor traffic laws and policies, flooded roads during wet seasons, illegal parking/lack of parking space and lack of mass transit system among others. Since some of the causes are interrelated, only some major causes as assessed by the researcher would be discussed in this study.

Increase in Traffic Density and Reduction in Road Capacity

From a population of over 3.4 million in 1983, the population of Dhaka City has increased to over 15 million in 2015 (World Bank, 2010). The increase in population also led to an increase in the number of vehicles plying the roads in the City which is not commensurate with the increase in road capacity in the City. All types of transport modes such as rickshaws, private vehicles and buses share the same space of every class of roads even in rickshaw -free roads as there is no specific functional classification of road usage.

From proven statistics, it was established that increase in traffic density has led to TC in Dhaka City. This is because as the urban setting became denser this tended to impair circulation. Densities lower than 10,000 people per square mile tend to have limited effect on driving speed, and as soon as this threshold is reached, driving speeds substantially decline (Azad 2009) causing congestion. Currently, the average traffic speed in Dhaka is 6.4 kph as against the average speed of 13.7km in 2010. However, if vehicle growth continues at its current pace, without substantial public transport investment the average speed may fall to 4.7 kph by 2035—about as slow as walking (Gallagher, 2016).

Poor Traffic Management and Enforcement

Poor TM has been identified as a major cause of TC in Dhaka City. Along some major roads, there are either malfunctioning or non-operational traffic lights, absence of road signs, inadequate designs for traffic signaling systems at intersections, inadequate enforcement of laws by the various agencies responsible for TM in Dhaka City and low penalties given to punish violators of traffic regulations. Generally, implementing law to curb human excesses is usually met with challenges and resistance.

To ensure success in enforcement of traffic regulations, there has to be a reorientation of the agencies responsible for enforcement. This is because of reports of widespread corruption prevalent in the agencies. Government must also ensure that there is an up-to-date vehicle data base which should be maintained to keep track of traffic offenders. It would also be necessary for trained man-power to manage this important source of information.

Illegal Parking and Lack of Parking Space

Illegal parking occasioned by lack of parking space is one of the major causes of TC in cities of most developing nations. Lack of parking space causes rickshaws and commercial transport wait at intersections for passengers and make U-turns in the middle of the road, thereby causing TC. In Dhaka City, inappropriate location of commercial buildings, lack of entry and exit facilities as well as wrong planning and design of the existing parking spaces, cause TC. Insufficient parking space force people to park on the roadsides, creating further congestion. Illegal parking at roadside mostly takes place in commercial areas like Motijhil, Gulistan, Old Dhaka, Shyamoli, New Market, Eskaton Road, Banani, Gulshan Avenue and Kamal Ataturk Avenue among others (Mozammel, 2014). Though there is a draft parking policy for Dhaka City, it has never been implemented due to unclear directives as to the agency responsible for its implementation (DUTP).

Effects of Poor Traffic Management on Dhaka City's Economy

Some of the effects of poor TM to the economy of Dhaka City include; loss of man hours, extra transport cost, loss of life and property, loss of time/ delays and lateness to appointments. Others include extra fuel cost, health and environmental effects, accidents and social effects. However, while some of these effects are related, others are not quantifiable despite the severity of their effect on the economic benefits of Dhaka City. Thus, only the quantifiable effects and the more severe unquantifiable effects will be treated in subsequent paragraphs.

Loss of Man Hours

Research indicate that most workers in Dhaka City, work about 8 hours daily, usually between 0800 hrs and 1600 hrs, and 5 days a week, usually between Sundays and Thursdays. On the average, people spend 2.35 hours in the traffic daily during the week (Mamud et al, 2012). This implies a loss of 6.30 weekly, or almost a whole working day in traffic every week. If that amount of time wasted is spread among workers in Dhaka, the effect on the economy is significant. It also implies that some workers arrive at work late or tired (if they have to leave earlier to arrive at work early) and might not be able to function optimally.

The total monetary value of the hours lost per day per worker can be estimated annually as follows; if an employee works 8 hours per day, 40 hours per week, 160 hours per month and 1920 hours per year. This equals to an average of 48 weeks per year leaving 4 weeks for annual holidays. Since the research findings has demonstrated that 1.30 hours is lost daily on congestion, $1.30 \text{ hours} \times 5 \text{ working days} \times 48 \text{ weeks} = 360 \text{ hours lost per year}$. When these 360 hours are divided by 8 (which is one working day for an employee); almost 45 days are lost per year. This is equal to a month and a half. When the 360 hours that is lost annually is multiplied by half of the working population of Dhaka City which is 10,503,658 (BBS 2011); $5,251,829 \times 360 \text{ hours} = 1,890,658,440 \text{ hours}$ that are lost per year. If we assume that one working hour is paid 160 Tk (using average monthly disposable salary of Tk 26,000), every year about 302,505,350,400 Tk or USD 3,781,316,880 man hours is lost due to TC in Dhaka City by the researcher's estimate. This is a huge loss both at individual and organizational level.

Extra Fuel Cost

A number of drivers in Dhaka City acknowledged the high rate of fuel consumption especially petrol and diesel by cars and motorcycles due to queuing in traffic. The stopping and starting in traffic jams burns fuel at a higher rate than smooth rate of travel on the open highway. This increase in fuel consumption costs commuters additional money for fuel. This is a huge loss for the economy of the individual and the country at large given the price of fuel.

Dhaka City has an average of 12,588 cars, jeeps and microbuses (STP 2015). Assuming that half the number loses a litre of petrol per day due to TC, a total of 6,294 litres of petrol is lost in a day. At the current price of 100 Tk per litre of petrol, an average of 629,400 Tk is lost per day and 229,101,600 million Tk per year to TC. This does not include losses from other modes of vehicular transport like buses, taxis, CNGs and motorcycles. It is however important to note that the fuel cost due to TC is subject to the fluctuations of fuel prices, taxes and/or subsidized fuel and hence constitute a major source of uncertainty in such estimations. Nonetheless, the amount arrived at is the researcher's estimated cost and not the exact figure (which is probably higher) that is wasted on extra fuel cost due to TC. There is no doubt that the huge funds being wasted daily on extra fuel cost due to TC, could be positively channelled to grow the economy of Dhaka City if the current traffic situation is effectively managed.

Environmental Pollution and Health Implications

Environmental pollution is by far one of the most serious concern related to urban transportation. Road TC has been identified to lead to environmental pollution. This is due to the carbon dioxide smoke emitted by the cars which their engines are just on but not moving. During road TC, vehicle emissions pollute air and consequently affect people's health. Likewise, the use of horns causes noise pollution. Noise is a serious health hazard and the health effects of hazardous noise exposure are now considered to be an increasing dangerous public health problem. Prolonged or excessive exposure to noise, whether in community or at work; can cause medical complications such as hypertension disease. Noise can adversely affect performance of various activities such as reading, office work, and problem solving.

In Dhaka City, abnormal health conditions arising from motor vehicle emissions as a result of TC, worsens the health status of many citizens. Specifically, nitrogen dioxide (NO₂), carbon monoxide (CO), sulphur dioxide (SO₂) and hydrocarbon (HC) which are pollutants that react with nitrogen oxides (NO₂) in the presence of sunlight form smog. Smog causes damage to the human respiratory system with symptoms such as pneumonia, shortness of breath, reduced lungs capacity and other Cardiovascular Respiratory Disorders.

Loss of Life and Property

Road TM seeks to provide a safe and free flow of traffic, and minimise Road Traffic Accidents (RTA) on the roads and highways. When traffic is effectively managed, RTAs are significantly reduced, likewise, the loss of lives and property. A total of 2,720 accidents occurred in Dhaka City within 2007-2011 with a total of 3,751 vehicles involved (Bayes Ahmed, 2012). Also, 71 per cent of the accidents occurred where there was no junction, and 63 per cent occurred where there was no traffic control.

The loss of human lives, which is unquantifiable in monetary terms, and property such as vehicles worth millions of Taka, through RTA greatly impinge on the production of goods and services. Therefore, it is safe to conclude that effective TM would reduce the loss of human lives and property thus enhancing the economic development of Dhaka City.

Challenges for Improving Traffic Management System in Dhaka City

The Challenges against an effective TM system include weak enforcement of traffic laws, poor coordination of TM agencies, inadequate TM infrastructure, inadequate funding, inadequate manpower and poor private sector investment.

Weak Enforcement of Traffic Laws

There are mobile courts in Bangladesh and they are empowered by regulation to function under various laws including trial of traffic offenders. They are placed at strategic points in Dhaka City to examine fitness of motor vehicles, driving licences, etc and where necessary punish violators (Gazi D Hosain, S Ferdous, 2010). Despite the existence of mobile courts to address such issues, incidents of the courts punishing traffic violators are rare in Dhaka City.

Trial of traffic offenders in conventional courts are usually protracted and complicated since they are most times executed in magistrate and high court. In most cases, only very serious offences such as RTAs that result in death, disability or destruction of public property are taken to court. Minor offences are treated at the discretion of the traffic police and other relevant agencies. As such, implementation of traffic law is a challenge to effective TM in Dhaka City.

Inadequate Infrastructure

In 2015, the GoB budgeted Tk 111,720 million for the transport sector which was expected to be shared among 9 State Owned Enterprises (SOE) including the RHD and Bangladesh Railways among others (STP 2015). This is grossly inadequate considering the amount expected for the development of road transport infrastructure. This act of underfunding has made difficult the provision and maintenance of road infrastructure. Accordingly, the resultant effects of its non-provision are evident in the rate of RTAs and acute TCs experienced in Dhaka City.

Inadequate Manpower and Logistics

Most of the agencies responsible for TM in Dhaka City are inadequately manned. They also lack necessary equipment to carry out their duties such as vehicles, motorbikes, walkie talkies, speed guns etc. At present the total manpower approved

for BRTA is 824 out of which only about 50 per cent of posts are filled up (STP 2015). Due to manpower shortage and logistics, the DMP was reorganized to operate under the control of Joint Commissioner with an increased manpower of 3,645 (STP 2015). Despite the reorganisation, there was no substantial increase in personnel working in the field. The World Bank financed the DUTP and provided DMP with motorcycles, wreckers, walkie talkies, etc in 2003-2004. However, these equipment have become outdated, spoilt or lost over the years.

Poor Private Sector Investment

Private sector investment in TM in Dhaka City is still in its infant stage when compared with some developed/developing countries. In TM there are numerous areas which are viable for private investors. These include provision of towing services, provision and maintenance of car park services, advanced vehicle and road worthiness testing and traffic information services. The provision of these facilities and services would have immense impact on TM in Dhaka City.

Considering the numerous areas viable for PPP in TM, it is surprising that not many investors have indicated interest in the various opportunities available in this sector. This investors apathy could be attributed to suspicion, lack of trust and poor investment climate in Bangladesh. Furthermore, investors would like the GoB to clear grey areas pertaining to risk sharing and insurance for their investments. Until then, investor response would remain slow, thus adversely affecting TM and economic development.

Strategies for Improved Traffic Management in Dhaka City

Provision of Efficient Public Transport Alternatives

For large urban areas such as Dhaka, the only way to effectively meet transport demand is to provide the city with a high quality public transport system that must be developed in integration with urban development (STP 2015). Given the major increases expected in population and travel demand, MRT was considered more suited for long term development due to its higher carrying capacity over the BRT. Hence, the STP 2015 recommended 5 MRT lines and just 2 BRT lines. To assist decentralization, the STP 2015 proposed focusing future development in sub -regional centres that are expected to hold over 5 million people by 2050

such as Gazipur, Ashulia, Savar, Jhilmil, Narayanganj and Purbachal, with good connections via the new roads and the recently commissioned metro-rail.

Enforcement of Traffic Laws and Empowerment of Mobile Courts to try Traffic Offences

Proper enforcement of traffic laws could mitigate the challenge of disobedience and weak implementation of traffic law. Enforcement should be done with the coordination of the various TM authorities in Dhaka City. It should also be done with the help of mobile courts to expeditiously try traffic offenders. The GoB could enforce the regulation on mobile courts and lay emphasis on their use in the speedy trial of traffic offences. The DCC could also request for the Ministry of Justice to provide adequate magistrates and other relevant infrastructure for the mobile courts to function effectively. This would negate the further need to patronize magistrate and high courts for traffic offences. Such cases would then be tried at mobile traffic courts.

Creating Conducive Environment for Private Sector Participation

To mitigate the challenge of low private sector investment, DCC could create a conducive environment for private investment. This could be achieved by DCC providing guarantees for loans required by private investors. This would not only fulfil basic requirement for the loans but would also encourage potential investors especially in areas of private investment earlier discussed such as provision of towing services, provision and maintenance of car park services, etc. Furthermore, DCC could facilitate the enforcement of traffic laws to encourage patronage of such investment. By this, projects would be assured success which would further encourage both the financial institutions and private investors.

To strengthen its commitment to the PPP agenda and the need for a favourable atmosphere for private sector participation, a PPP office was set up by government to provide institutional support and identify potential projects. The PPP office has conducted feasibility studies, ascertained the level of risk and viability of 15 road, rail, and port related projects for implementation and this has been included in the SFYP 2016-2021. As a show of confidence in the PPP proposal, DCC could commence considering the viable PPP projects involving Dhaka City road transport infrastructure for loan guarantee.

Enhancement of Road Transport Infrastructure

Enhancement of road transport infrastructure could mitigate the challenge of inadequate road infrastructure. To deal with the predicted TC, the STP 2015 proposed a massive programme of road building involving 1,200km of new main road (roughly double the current main road network) including 5 elevated expressways and 3 ring roads (STP 2015). The provision of new infrastructure and the maintenance of existing infrastructure would make for passable roads, free flow of traffic and alternative routes for commuters. This would, in turn, drastically ease up congestion and enhance the movement of goods and services.

Implementation of Parking Policy and Introduction of Area Licensing in Central Business District

The STP 2015 recommended some short term parking policies aimed at the development of efficient parking systems to mitigate the effect of TC in Dhaka City. The policy recommended measures necessary for efficient parking management in Dhaka City such as the enforcement of parking bans at prohibited places, payment of fees for public parking and the introduction of time-based parking fee system for high parking demand areas such as the Central Business District (CBD). Implementation of the policy would reduce TC on radial roads within the CBD and by so doing, reduce air, noise and environmental pollution. It would also encourage the use of public transport, further reducing parking demand in the City area.

Area licensing is also a TM scheme that restricts the use of private vehicles in designated areas to alleviate TC and at the same time promote the use of public transportation. The basic idea is that when an area is specified as restricted, charges are levied on vehicles entering that area during certain times of the day. The charge works as a disincentive for using private vehicles and as such, people may choose to use other modes of transportation to avoid the charge, or change the time of travel to off-peak hours when the charge is smaller or not enforced. To complement the area licensing system, higher parking fees could be placed on parking in public areas. Collected charges from the 2 initiatives could be used for the improvement of transportation facilities in Dhaka City. The collection could be done by DCC or private investors on a PPP basis.

Establishment of a Special Marshal Volunteer Corps

Establishment of a special marshal volunteer corps in Dhaka City would improve RTM capabilities of the DTCA and DMP for enhanced TM in Dhaka City. The Special Marshals would be the volunteer arm of the DTCA and would comprise of men and women of proven integrity capable of influencing their immediate environment in favour of the course of TM and road safety. They would be empowered to control traffic at busy intersections in conjunction with traffic police. They would also be able to detain offending traffic defaulters and hand them over to DMP for prosecution.

Implementation of Road Fund

The challenge of low budgetary allocation to the DTCA for TM in Dhaka City could be mitigated by the implementation of the Road Fund. This issue of road fund has been discussed on various occasions and a Road Fund Steering Committee was set up in 2003 to address the issue but its set up and implementation has been delayed. The basic theory of the road funds is that those who benefit from having good roads will be required to pay for that benefit; It means that road users pay for the services they get from the road network (STP 2015).

Sources of monies for the Fund would include donations from corporate bodies and individuals, and public-private partnership with DCC in response to the challenges of TM in Dhaka City. Other potential sources of the Fund are Vehicle registration fee, Driver Licenses and Annual Road Tax among others. This Fund would augment the budgetary allocation to DCC by the GoB for TM. The Fund would be used to equip and train personnel involved in TM and in the maintenance of traffic and road transport infrastructure.

Recommendations

The recommendations that stem from the research study are categorised into 3 general groups; institutional and capacity development, funding and infrastructural development.

Institutional and Capacity Development

To ensure proper organisation of TM and capacity development of TM agencies, DCC should:

- Establish Special Traffic Marshal Volunteer Corps for Dhaka City.
- Lobby the GoB to empower mobile courts for the speedy trials of traffic offenders.

Funding

To obtain more funds for transport management, It is recommended that DCC should:

- Provide guarantees for loans required by certified private investors in targeted areas of transport/traffic infrastructural development and management.
- Implement parking policy in Dhaka City and introduce area licensing for CBD under PPP arrangement.
- Lobby the GoB for the implementation of the Road Fund for collection of monies to augment budgetary allocations for transport/TM.

Infrastructural Development

To ensure infrastructural development of TM infrastructure in Dhaka City, DCC and GoB should:

- Expedite action on the construction of BRT in the short to medium term and the MRT in the long term (before 2035).
- Enhance RTI to tackle TC in Dhaka City.

Conclusion

This study set out to appraise the economic benefits of an improved TM system in Dhaka City. In the process, the study established that road traffic, when ineffectively managed, creates negative aftermath that have direct detrimental consequences on the economic benefits accruable to Dhaka City.

The study revealed that the GoB and DCC over the years have made giant strides towards preventing and mitigating the various effects of poor TM on the economy, human lives, property and the environment. The efforts, though commendable, have not yielded the desired results, as TC, RTAs, environmental pollution, etc arising from ineffective TM still persists. This goes to prove that there are some fundamental issues relating to TM that need to be addressed for effective and efficient TM towards economic development of Dhaka City.

In X-raying the effects of TM on Dhaka City, it was established that poor TM has negative effects on the economy. Firstly, it reduces the GDP of DCC through loss of productive man-hours. Secondly, it continuously increases environmental pollution which adversely affects human health and economic activities. In addition, ineffective TM results in RTAs leading to loss of lives, and property worth billions of Taka annually. Furthermore, inefficient TM which causes TC leads to extra transport costs for commuters and extra-fuel cost for car-owners. All of these effects have negative impact on the economy of Dhaka City. To mitigate identified challenges to effective TM, strategies were proffered.

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Captain Chijioke Onyemaobi has been awarded the Forces Service Star and the Meritorious Service Star for his unblemished service to the nation. Other awards include the ECOMOG Medal and the Passed Staff Course Dagger. His academic qualifications are, Bachelor of Engineering Degree in Mechanical Engineering, Post Graduate Diploma in Public Administration and a Master's Degree in International Affairs and Diplomacy. He is an associate member of the Nigerian Institute of Management. He enjoys playing scrabble, tennis and volley ball.