



## TRAFFIC CONGESTION IN DHAKA CITY: POTENTIAL SOLUTIONS

**Ashrafur Rahman<sup>1</sup>,**

**AKM Fazlul Hoque<sup>2</sup>**

<sup>1</sup>Additional Deputy Commissioner,  
Office of the Deputy Commissioner,  
Moulovibazar, Bangladesh

<sup>2</sup>Senior Assistant Secretary,  
Ministry of Public Administration,  
Bangladesh Secretariat, Dhaka, Bangladesh

### **Abstract:**

The study was conducted to explore the root causes and impacts of current traffic jams and suggest an appropriate strategy to wipe out this problem of Dhaka, the capital of Bangladesh. A mixture of both qualitative and quantitative methodologies was considered for data collection and analysis. The study shown the causes of traffic congestion of Dhaka, namely, inefficacy and poor execution rate of current traffic code of practice, existence of too many regulatory authorities, violation of traffic rules, defective planning of city roads, excessive vehicles, illegal occupancy of roads and footpaths, want of communication set-up and logistic provision, inadequacy of traffic management team and shortage of public vehicles. It was exposed by the study that Dhaka's traffic situation is not friendly for improved living standard. Environmental risks, severe air and sound pollutions and serious loss of public health are the end results of Dhaka's traffic jam. Moreover, both micro and macro economical situation of Bangladesh is being exaggerated due to this problem. The study strongly recommended that an up-to-date and integrated strategy is needed to cope-up the current traffic chaos of Dhaka. Initiation of subway, introduction of road pricing/congestion charge, construction of bypass roads for inter-city connectivity, investment of adequate public money, steps for regain the illegally occupied footpaths, more construction of communication infrastructure, ban of rickshaw and other non-motorized vehicles, increase of public awareness program, logistic support and public bus are identified by the study as potential solutions of Dhaka's congestion.

**Keywords:** traffic jam, subway, road pricing, public awareness, potential solution

## 1. Introduction

Bangladesh is on the top among the most densely populated countries of the world. Because of the high density of population, it is feeling a large number of socio-economic problems. Among these, traffic congestion is one of the most severe problems and this spread over especially to Dhaka which is facing crushing consequences of traffic congestion. This city is recognized all over the world for traffic congestion as well as its high population density. Above 12 million people are residing in the Dhaka city and the number is increasing day by day, creating lots of problems including traffic congestion (Hadiujjaman, 2015). He also exemplified that around 0.7 million rickshaws fly in Dhaka every day, contributing to congestion in the city. A well-known periodical of the USA mentioned Dhaka as the traffic congestion capital of the universe (The Daily Star, 2015). Regarding communication and usual daily activities, traffic cramming has created substantial problems for the city dwellers. There are negative significances of the alarming traffic jams seen in Dhaka, at both micro and macroeconomic levels. It has been estimated that a minimum of 25% of the land in a city should be used for road infrastructure with a view to managing the traffic effectively (Assignment Point, 2015). In Dhaka city, only 7% of the land is used in this purpose whereas this figure is more than 20% in many developed capital cities of the world (Fang, 2014). For this reason, Dhaka is experiencing colossal traffic jams. Moreover, unplanned urbanization, unauthorized car parking, a large number of vehicles, unlawful possession of road side space by hawkers, violation of traffic rules and high density of population all contribute towards the awful traffic congestion seen in Dhaka (Barnamala, Sultana and Taniya, 2015). Hence, to assure a strong national economy and to improve the quality of life of the city's inhabitants, urgent steps are required to tackle this crisis. The study was aimed: (1) to examine the causes behind the congestion and assess the characteristics of the current traffic management system used in Dhaka; (2) to review the effect of traffic congestion on different sectors; (3) to identify and recommend an appropriate strategy to tackle the traffic congestion in Dhaka city.

## 2. Materials and Methods

### 2.1 Selection of respondents

To collect the actual and required data, respondents were selected very carefully from different stages and sectors having vast knowledge, experience, real life observation on the various aspects of traffic jam and traffic management of Dhaka. Government and non-government professionals connected with traffic management, traffic rules formulation and implementation were also selected as respondents. Respondents' working organizations, professions, length of experience and some other factors had been taken into account in terms of their selection. Politicians were also selected as respondents to know their view regarding the issue. Vehicle operators, transport workers, leader of transport owner and worker associations and passengers were considered as respondents to get the real life observations on the issue.

## **2.2 Preparation of questionnaire and distribution**

On the light of extensive literature review and according to the aim and objectives of the research, survey questionnaire were prepared to collect the opinion and perception of the respondents on the research topic. 30 important factors related to causes of traffic jam in Dhaka, traffic management, consequences and solution of traffic jam are identified to incorporate in the survey questionnaire. At the end of the survey questionnaire participants were requested to put their valued comments and suggestions about the discussed issue. Survey questionnaire was distributed through e-mail to the respondents with a forwarding letter.

## **2.3 Primary data collection**

Primary dataset were collected through interviews, questionnaire or observations. A semi-structured questionnaire were developed to collect data from selected participants e.g. the high and mid-level officials of relevant ministries and departments, representatives of transport owners, policy makers, relevant NGO representatives, representatives of workers associations, general people, vehicle operators etc through E-mail.

## **2.4 Secondary data collection**

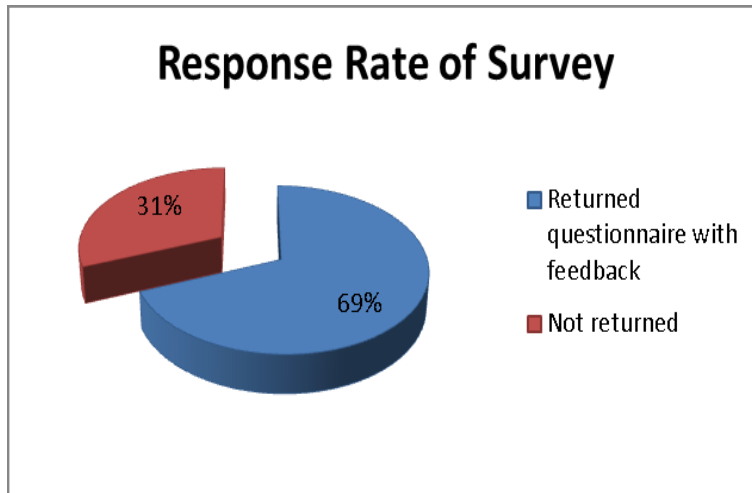
Relevant secondary data and information from various official sources were collected to support the study such as project documents, annual reports, annual statistics, official regulation documents, grey literature and journal articles, archives and libraries, collections and museums, professional and commercial organizations, the field and the internet.

## **2.5 Data analysis**

Data were analyzed by utilizing content analysis as well as descriptive statistics methods. Analyzed information were presented at the shape of charts as well as tables that illustrate their related means and percentages. MS Excel was used for analysis of quantitative data. In this study, 5-point Likert scale was utilized to find out the hierarchies of the factors and issues of Dhaka's traffic congestion and its solution. Participants are requested to put their opinion on thirty factors/issues related to Dhaka's traffic jam and its solution. There were five options for each factors/issues to rank. Those options were strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4) and strongly agree (5). The number shows within bracket indicates the ranking point for the option.

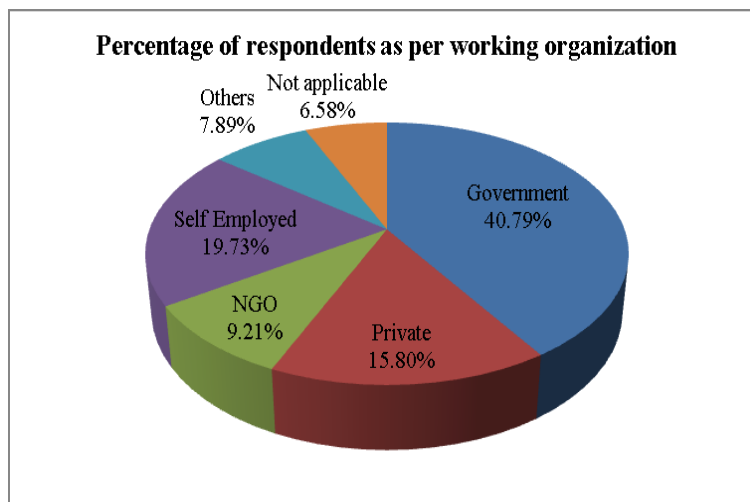
## **3. Results**

Out of 110 distributed survey questionnaires, 76 filled up questionnaires had received with some valuable comments. The response rate was 59.00% which was summarized in Fig. 1.



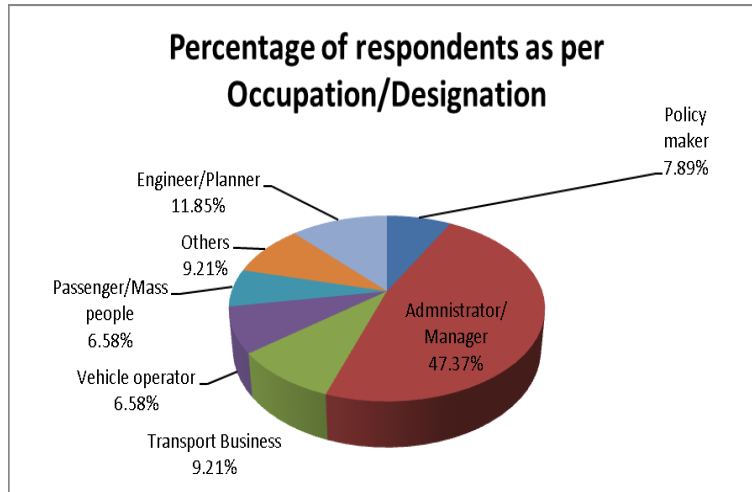
**Figure 1:** Response rate of survey questionnaire

Among the total 76 respondents 31 were from government organizations, 15 were self-employed, 12 were from private organizations, 7 were from NGOs, and 6 were from other organizations. 5 respondents were passengers and members of the public who were the upmost sufferers of the traffic jams. The percentages of the respondents showed that maximum respondents (40.79%) were working in government organizations, second highest respondents were self-employed (19.73%). 15.80%, 9.21% and 7.89% respondents were from private organizations, NGOs and other organizations respectively (Fig. 2.).



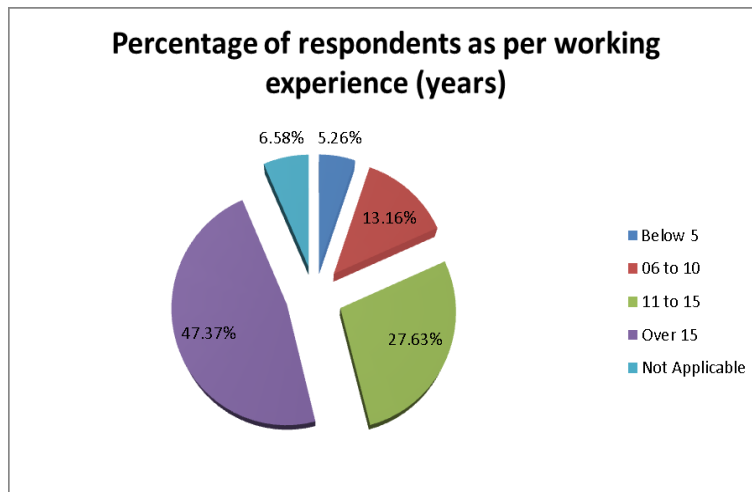
**Figure 2:** Percentage of respondents as per working organization

Among the total respondents, administrators/managers were the majority. 47.37% respondents were administrators/managers (Fig. 3). Second highest respondents were engineer/planner (11.85%). Respondents from transport business person and other category were same (9.21%). At the same time participation of policy maker and vehicle operator were also same (7.89%).



**Figure 3:** Percentage of respondents as per occupation/designation

Fig. 4 depicted respondents' length of experience in their work places. It represents that 5.26% respondents have below five years' experience, 13.16% have 6-10 years' experience, and 27.63% have 11-15 years' experience. Around half of the respondents (47.37%) have over fifteen years' experience which is the best source for reliable and effective data for the study. It is also found that 6.58% respondents have no working experience.



**Figure 4:** Percentage of respondents as per working experience

The data assembled from the filled up questionnaire, e-mail and telephonic interview were categorized (Table 1) in order to rank and presented in a tabular form and graphical manner where regarding suitability.

**Table 1:** Responses of participants with ranking

Sl. no.	Considering issues/factors	Number of participants with ranking				
		Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
01.	Traffic management scenario in Dhaka is satisfactory.	0	3	3	34	36
02.	Violation of traffic rule is responsible for congestion of Dhaka city.	34	28	12	2	0
03.	Presence of excessive vehicles on the city road is creating congestion in Dhaka.	36	29	8	3	0
04.	Inadequate infrastructure of road communication is liable for traffic jam in Dhaka.	23	39	8	5	1
05.	Imperfect planning of city road is one of the major cause behind the traffic jam of Dhaka	39	24	5	6	2
06.	Enforcement rate of traffic rules and regulations is satisfactory.	0	2	9	29	36
07.	Existing legislations are not effective enough to manage present hectic traffic situation of Dhaka.	48	22	4	2	0
08.	Inefficiency of traffic management team is one of the main causes of traffic jam of Dhaka city.	22	27	14	7	6
09.	Existence of too many regulatory authorities for traffic management is an obstacle on the way to effective traffic management.	44	27	4	1	0
10.	Dhaka's traffic environment is not congenial for improved living standard.	11	38	17	8	2
11.	Dhaka's traffic jam is a serious threat for the national economy of Bangladesh.	36	21	7	8	4
12.	Traffic jam is a vital factor in case of Dhaka's Environmental hazard.	22	28	19	6	1
13.	Public health is seriously effecting due to traffic jam in Dhaka.	31	29	9	2	5
14.	Traffic jam triggers severe noise and air pollution in Dhaka city.	18	29	22	7	0
15.	An up-to-date and robust strategy is required for effective traffic management in Dhaka.	49	21	4	2	0
16.	Rickshaws and non-motorized vehicles should be banned with proper replacement with a view to reducing congestion.	11	14	2	33	16

Ashrafur Rahman, AKM Fazlul Hoque  
TRAFFIC CONGESTION IN DHAKA CITY: POTENTIAL SOLUTIONS

17.	Road pricing/congestion charge should introduce to control the pressure of excessive vehicle on the city road.	45	17	3	10	1
18.	Narrow roads should be declared as one way for smooth traffic flow.	12	39	12	9	4
19.	Existing public vehicles are enough to meet the traffic demand of Dhaka city.	5	9	8	33	21
20.	Introduce of bypass roads for inter-city road communication will lessen the traffic jam of Dhaka.	37	22	12	5	0
21.	Metro and underground rail network is a suitable option to tackle the congestion of Dhaka.	37	26	10	3	0
22.	More construction of communication infrastructure e.g. roads, flyovers, over passes, under passes etc are required to address the existing congestion of Dhaka.	23	32	12	7	2
23.	More public money should invest to develop transport infrastructure of Dhaka.	34	29	5	6	2
24.	Circular waterway is an effective way to reduce the congestion of Dhaka.	9	22	11	23	11
25.	Individual vehicle provision for GO/NGO officials should be replaced by the sharing vehicle provision to address the existing traffic jam.	7	24	12	22	11
26.	Existing logistic support is sufficient to address the present congestion of Dhaka.	5	4	19	28	20
27.	Special initiative for getting back the footpaths from the illegal usurper is a vital fact to reduce the traffic jam of Dhaka.	25	31	11	6	3
28.	Existing inter-city bus stations, rail stations and airport should be shifted outside of Dhaka for smooth traffic flow.	12	29	8	18	9
29.	Existing public awareness program regarding importance of following traffic rules to reduce traffic jam is enough.	2	11	14	37	12
30.	Political commitment is a vital factor to root out the traffic jam from Dhaka.	28	33	10	3	2

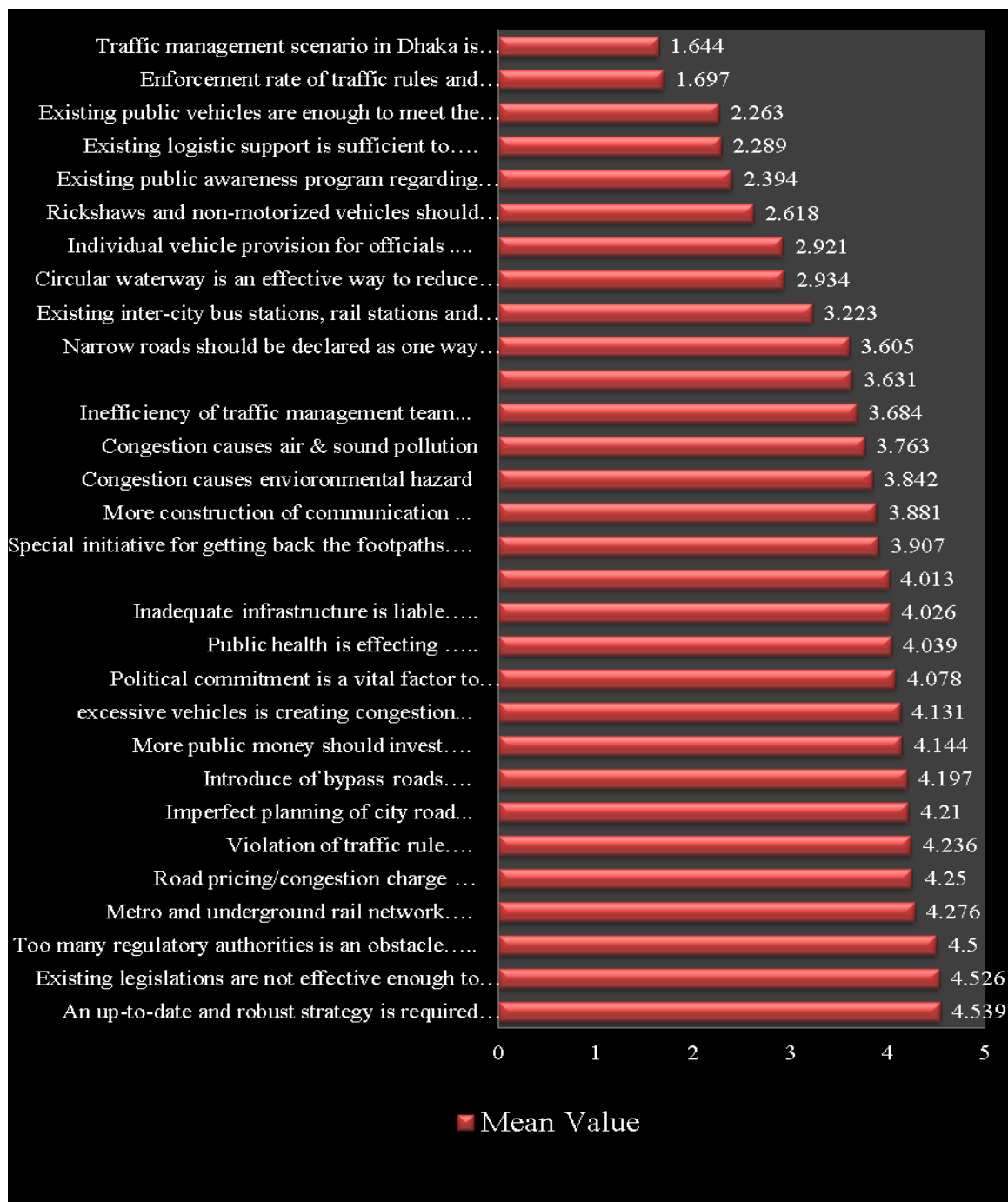
The mean value of every issues/factors incorporated in the survey questionnaire was computed through an easy mathematical equation (Fig. 5). From the analysis it was found that out of 76 respondents 49 and 21 are strongly agree and agree respectively with the requirement of an up-to-date and robust strategy for effective traffic management in Dhaka. The mean value of this issue is 4.539 and its position in the hierarchy is 1<sup>st</sup>. So, it can be said that this issue is a vital factor to address the traffic jam of Dhaka city. Analysis shows that out of 76 participants 65 are felt that existing legislations are not effective enough to manage the present traffic situation of Dhaka. The hierarchy positions of this issue is 2<sup>nd</sup> and mean value is 4.526 which indicate that it is an important factor to consider. 44 respondents strongly believe and 27 respondents believe that the existence of too many regulatory authorities for traffic management is an obstacle for effective traffic management. The mean value of this issue is 4.50 with third hierarchy position. 82.89% respondents believe (48.68% strongly agree and 34.21% agree) that metro and subway would be a better option to tackle the congestion of Dhaka. Mean value of this issue is 4.276 with fourth hierarchy position. A wide range of participants opined that road pricing/congestion charge should introduce to control the pressure of excessive vehicle on the city road. Out of 76 respondents 59 opined that introduce of bypass roads for inter-city road communication is the effective way out from the gridlock. As per the mean value the hierarchy position of these factors are 5<sup>th</sup> and 8<sup>th</sup> respectively. Investment of more public money (mean value is 4.144) and political commitment (mean value is 4.078) is vital factors to address the congestion of Dhaka city - opined by the respondents. Hierarchy position of these two factors is 9<sup>th</sup> and 11<sup>th</sup> respectively.

Maximum respondents agreed that violation of traffic rule (mean value 4.236), imperfect planning of city road (mean value 4.210), presence of excessive vehicles (mean value 4.131), and inadequate infrastructure of road communication (mean value 4.026) are the vital causes behind the traffic congestion of Dhaka city whose hierarchy position is 6<sup>th</sup>, 7<sup>th</sup>, 10<sup>th</sup> and 13<sup>th</sup> respectively. A majority of the respondents believe that the national economy of Bangladesh is hampered due to traffic congestion (mean value and hierarchy position is 4.013 and 14<sup>th</sup> respectively). Remarkable participants opined that severe effect on public health; environmental hazard and serious air and sound pollution are the consequence of traffic jam in Dhaka city. As per the Fig. 5 the mean values of these issues are 4.039, 3.84 and 3.763 and hierarchy position is 12<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> respectively.

Maximum participants didn't support that rickshaws and non-motorized vehicles should be banned with proper replacement. As per their ranking the hierarchy position of this issue is 25<sup>th</sup>. As per the mean value presented in the table 4.5, the hierarchy position of special initiative for getting back the footpaths from the illegal usurper, more construction of communication infrastructure, declaration of narrow roads as one way are 15<sup>th</sup>, 16<sup>th</sup> and 21<sup>st</sup> respectively. Respondents were strongly disagree with the statement e.g. traffic management scenario of Dhaka is satisfactory, enforcement rate of traffic rules and regulations is satisfactory, existing public vehicles are enough to meet the traffic demand of Dhaka city, existing logistic support is



sufficient to address the present congestion of Dhaka and existing public awareness program regarding importance of following traffic rules to reduce traffic jam is enough. They expressed their negative opinion regarding these statements. As a result these issues were positioned in the hierarchy as 30<sup>th</sup>, 29<sup>th</sup>, 28<sup>th</sup>, 27<sup>th</sup> and 26<sup>th</sup> respectively. Regarding the transfer of existing inter-city bus stations, rail stations and airport, circular waterway and sharing vehicle provision, respondent's interest was not high. For this reason hierarchy position of these issues were 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup>. According to mean value, hierarchy positions of the issues/factors are demonstrated below in the form of bar chart:



**Figure 5:** Mean values of issues/factors relating to traffic jam in Dhaka and its solutions with ascertained position

#### 4. Discussion

A stagnant long queue containing a variety of vehicles and congestion is a common scenario of Dhaka. 73% of the e-mail interviewees opined that current traffic rules and regulations are dated and not effective enough to manage the current hectic traffic situation of Dhaka. Face-to-face interviewees were opined the same. As a result, existing strategies and legislations are not working effectively. Too many regulatory authorities are one of the most important reasons behind the congestion in Dhaka which is consistent to the result of Arif (2013). Both literature review and respondents of survey opined that an independent traffic regulatory authority is badly required for effective traffic management. Survey result revealed that violation of traffic rules and imperfect planning of city roads are also significant factors for traffic jam of Dhaka. Literature review also provides the same information. Mahmud, Gope & Chowdhury (2012) stated that violation of traffic rules and imperfect planning of city roads are the prime causes of traffic jam in Dhaka. Literature review showed that around one million registered motor vehicles are moving in the Dhaka city which is too much comparing to the present infrastructure for road communication (BRTA, 2015; 2016). Face-to-face interviewees stated that currently huge numbers of unfit motor vehicles are operating on the city roads and creating traffic jam. Maximum e-mail interviewees are also feeling that excessive vehicles are liable for traffic jam. Respondents of questionnaire survey mentioned that inadequacy of communication infrastructure and inefficiency of traffic management team is accountable for traffic jam. Maximum e-mail interviewees were agreed with the statement. This claim is supported by the literature review. According to Shamsheer and Abdullah (2013) as growth rate of road expansion is nominal than traffic growth rate so, existing communication infrastructure facilities fails to fulfill the growing requirement of additional space that creates a chaotic traffic situation (Taleb and Majumder, 2012).

Mahmud, Gope & Chowdhury (2012) stipulated that inefficiency of traffic management staffs is a notable cause of traffic jam in Dhaka. Political and social meetings, processions and fairs on the city roads and political intervention are identified as notable causes of traffic jam by the questionnaire respondents and both type of interviewees. Respondents suggested banning these types of activities for better traffic management. Huge public and commercial establishments of Dhaka are identified as another cause of congestion by the both types of interviewees. They further opined that administrative and commercial decentralization is the solution in this regard. Moreover, too many rail crossing, prolonged repair work, want of modern signal system, over population, wrong parking, frequent accident, overtaking are also identified by the respondents as causes of traffic jam. Literature review uncovered that national economy of Bangladesh is severely hampering due to traffic jam of Dhaka. Khan and Hoque, (2013), illustrated that due to congestion Dhaka city is losing approximately three billion US dollars along with eight million working hours. Bangladesh is losing additional 1122.8 billion BDT for additional fuel utilization in every year (Mahmud, Gope and Chowdhury, 2012). Findings of the questionnaire

survey also present the same picture. Moreover, E-mail interview and literature review identified that national productivity is gradually degrading due to traffic jam. It is also identified by both e-mail and face-to-face interviewees that severe air and sound pollution is occurring due to traffic jam. Another consequence they identified that public health is being affected because of this pollution. Due to this pollution almost all the residents are suffering from eye and respiratory diseases. Literature review showed this truth that about 73% residents of Dhaka city are suffering from various types of physical or mental complications due to traffic jam (Mahmud, Gope and Chowdhury, 2012).

Alam and Habib (2003) opined that traffic jam is liable for emission of a large volume of greenhouse gases in Dhaka city. Literature review reported that traffic jam is degrading the living standard of city dweller. Hervey (2000) stated that congestion is diminishing the achieved living standard by external cost. Findings of e-mail and face-to-face interview also support this claim. As per the findings of the questionnaire survey, maximum respondents think that Dhaka's traffic environment is not congenial for improved living standard. To address the existing traffic jam of Dhaka an up-to-date and strong strategy is required- revealed by the questionnaire survey. According to the mean value, this attribute had positioned as first in the hierarchy. It's position in the hierarchy indicate that this issue should get priority in case of traffic management in Dhaka city. 100% e-mail interviewees agreed that a strong and updated strategy is necessary to address the current congestion of Dhaka. Knowledge from literature review also prop up this issue. As per the information of literature review dated and ineffective rules should be replaced by the new and need based rules and regulations for better traffic management. Harwell (1999) opined that to solve the congestion existing policies should modify. From the opinion and suggestions from all sources it is found that an up-to-date and robust strategy is badly needed to tackle the congestion of Dhaka. Although there is no metro/underground rail network and road tax/congestion charging in Bangladesh, almost all the survey respondents opined that initiation of these two systems will be effective to tackle the congestion of Dhaka. Around 82% of the E-mail interviewees stated that introduce of metro rail and 73% opined that initiation of road tax is an effective means to mitigate the traffic jam. Literature review also supports these conceptions. Hart (1998) stated that to mitigate traffic jam road pricing should be used. DIST had recommended introducing metro rail and subway to solve the congestion. Literature review showed that India had enabled to reduce Delhi's congestion by introducing metro rail. It is identified by the questionnaire survey that construction of bypass roads for the inter-city transportation will be supportive to address the problem. Review of literature unwrapped that due to absence of bypass roads, inter-city traffic flow through the capital city are degrading the congestion situation. Similar findings were revealed by the face-to-face interviewees. Although as per the literature review, rickshaws are one of the main causes for traffic jam but maximum respondents of the survey questionnaire didn't think rickshaw and non-motorized vehicles should be banned to tackle the traffic jam. Rather their opinion was arrangement of separate lanes for rickshaws and non-motorized car is the most suitable

solution in this regard. Opinion gathered by e-mail and face-to-face interview were same regarding this issue. Moreover, as per the explanation of Khan (2007), split lanes for rickshaws are badly needed. The survey result discovered that Regain of occupied roads and footpaths and construction of more communication infrastructures should be considered as important factors. Literature review identified that footpaths should be kept unoccupied for smooth traffic flow. e-mail and face-to-face interviewees were also stated that occupied footpaths should be recovered to eradicate traffic jam.

Taleb and Majumder (2012) opined that construction of more communication infrastructure is required to meet the additional demand. This claim was supported by the E-mail interviewees. Questionnaire survey established that public awareness program and number of public vehicles are not sufficient for desired level of traffic movement. E-mail interviewees opined that number of public buses and logistic support should increase to address the traffic jam of Dhaka. Literature review shows that the number of public buses is very few. Enhancement of public awareness building is recommended by literature review and both e-mail and face-to-face interviewees. More investment of public money is important factors to address the congestion of Dhaka. Survey results exposed this truth. E-mail interviewees are opined the same. Opinion of e-mail interviewees is budget for constructions of required infrastructure should increase. According to literature review, because of insufficient budget required development project for road communication cannot be initiated. Literature review exposed that arrangement of modern signaling system is considered as one of the solution. Shamoo and Resnik (2003) stated that traffic situation of the road can be improved by upgrading the strategies related to traffic signal. Suggestions of the respondents of the survey questionnaire also supported this information. Similar findings were explored by the e-mail interviewees. Although political commitment was identified as an important factor by the questionnaire, survey but there was no suggestions/comments regarding this issue by both types of interviewees. Perception of survey respondents regarding declaration of narrow roads as one way, sharing vehicle provision, circular waterway and transfer of inter-city bus stations, rail stations and airport from Dhaka were not positive. Rather some of the respondent commented that inter-city bus stations, rail stations should not shifted from the city. Position in the hierarchy of these issues/factors was 21<sup>st</sup>, 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup> respectively. No suggestions and comments were received in these issues from both E-mail and face-to-face interviewee. Literature review revealed that previous initiatives regarding circular waterway were failed.

## 5. Conclusion

It is an unpleasant truth that Dhaka city is being dominated by traffic jam over the fifteen years. Although several government and private initiatives were taken to address this dilemma but there was no achievement to mention. Rather, congestion situation is degrading gradually. In this context, to identify the causes and consequences of Dhaka's traffic jam and propose an appropriate strategy for solution,

this study was conducted. On the basis of the findings of the study, it can be said that the aim and objectives of the study were achieved.

Research finding showed that city dwellers were highly dissatisfied with the current congestion situation and traffic management scenario of Dhaka. As per the research findings, the most important causes behind the Dhaka's congestion are inefficacy of current traffic rules and their poor enforcement rate, existence of too many regulatory authorities, violation of traffic rules, imperfect planning of city roads, excessive vehicles, illegal occupancy of roads and footpaths, want of communication infrastructure and logistic support, inefficiency of traffic management team and scarcity of public vehicles.

The consequences of traffic jam, identified by the research are shocking. The living standard of the city dwellers is degrading gradually. It was exposed that Dhaka's traffic environment is not congenial for improved living standard. Environmental hazards, severe air and sound pollutions and serious damage of public health are the end results of Dhaka's traffic jam. Above all, Dhaka's traffic congestion is a big hindrance for the national economy of Bangladesh.

Basically, the solutions of Dhaka's traffic jam are hidden in its causes. Nevertheless, several vital factors for solutions are identified by the study. The study strongly established that an up-to-date and robust strategy is essential to manage the current traffic situation of Dhaka. Some significant factors were also identified by the study which should be the integral part of the up-to-date strategy. Initiation of subway is identified as an effective path to mitigate the congestion of Dhaka. Introduction of road pricing/congestion charge is identified as another impotent factor in this regard. Construction of bypass roads for inter-city connectivity and adequate investment of public money were also identified as important issue by the study. Initiatives for regain the illegally occupied footpaths, more construction of communication infrastructure and increase of public awareness program, logistic support and public bus etc were considered as important factors in this regard. Although there were some negative findings regarding rickshaw but most of the respondents were in favor of the existence of rickshaw in city road and recommended separate lanes for rickshaws.

The basic elements of the proposed up-to-date and integrated strategy should be the effective ways to address the identified causes of traffic congestion and findings of the study as solution. Considering all types of findings, the study suggests that The Government of Bangladesh should take strong initiative to formulate an up-to-date and integrated transport strategy covering the following recommendations for solution of Dhaka's congestion.

## References

1. Alam, M. J. B. and Habib, K. M. N. (2003). 'Effects of alternative transportation on congestions and air pollution in Dhaka city.' *Journal of Civil Engineering*, 31(2), pp. 165-175.

2. Arif, M.S. (2013). Role of Dhaka metropolitan police (DMP) in present traffic management system of Dhaka city. Master's thesis. BRAC University.
3. Assignment Point (2015). Traffic jams in Dhaka city. Assignment Point (2016) Report on traffic congestion in Dhaka city. Available at: <http://www.assignmentpoint.com/arts/modern-civilization/report-on-traffic-congestion-in-dhaka-city.html>(Accessed: 12 January 2016).
4. Barnamala, M.T., Sultana, S. and Taniya, R. K. (2015). 'Reasons behind the heavy traffic jam in Dhaka city.' International Journal of Multidisciplinary Research and Development, 2(2), pp. 470-473.
5. BRTA (2015). Number of registered motor vehicles in Dhaka (year wise). Available at: [http://www.brta.gov.bd/images/files/statistics/stat\\_dhk\\_11-15.pdf](http://www.brta.gov.bd/images/files/statistics/stat_dhk_11-15.pdf) (Accessed: 25 December 2015).
6. BRTA (2016). Year wise report for vehicles registration. Available at: <http://www.brta.gov.bd/statistics.html> (Accessed: 2 April 2016).
7. Fang, K. (2014). Can We Build Dhaka out of Traffic Congestion? Available at: <http://blogs.worldbank.org/endpovertyinsouthasia/can-we-build-dhaka-out-traffic-congestion> (Accessed: 11 May 2016).
8. Hadiujjaman, K. (2015). Traffic jam of Bangladesh and solution of this problem. Available at: <http://eforing.blogspot.co.uk/2015/03/traffic-jam-of-bangladesh.html> (Accessed: 23 December 2015).
9. Hart, C. (1998) Doing a literature review. London: SAGE Publications Ltd.
10. Harwell, M. R. (1999). Research design in qualitative/quantitative/mixed methods- chapter 10. Available at: [http://www.sagepub.com/sites/default/files/upm-binaries/41165\\_10.pdf](http://www.sagepub.com/sites/default/files/upm-binaries/41165_10.pdf) (Accessed: 21 April 2016).
11. Hervey, J. (2000). Urban land economics. 5<sup>th</sup>edn. London: Macmillan press Ltd.
12. Khan, M. A. (2007). When shall we get rid of Dhaka city traffic jam? Bitter truth. 20<sup>th</sup> October, The Daily Star, Bangladesh. Available at: <http://www.thedailystar.net/news-detail-8033> (Accessed: 9 February 2016).
13. Khan, S. M. and Hoque, M. S. (2013). 'Traffic flow interruptions in Dhaka city: Is smooth traffic flow possible?' Journal of Presidency University, 2 (2), pp. 46 - 54.
14. Khan, K. and Islam, M.R. (2013). 'Estimating costs of traffic congestion in Dhaka city.' International Journal of Engineering Science and Innovative Technology (IJESIT), 2(3), pp. 281-289.
15. Mahmud, K., Gope, K. and Chowdhury, S. M. R (2012). 'Possible causes & solutions of traffic jam and their impact on the economy of Dhaka city.' Journal of Management and Sustainability, 2(2), pp. 112-135.
16. Shamo, A. E and Resnik, D. B. (2003). Responsible conduct of research. New York: Oxford University Press.
17. Shamsheer, R. and Abdullah. M. N (2013). 'Traffic congestion in Bangladesh- Causes and solutions: A study of Chittagong Metropolitan City.' Asian Business Review, 2(3), pp. 13-18.

18. Taleb, M. A. and Majumder, S. (2012). 'Impact of flyovers in Dhaka city of Bangladesh on the affected people in the adjacent area.' *International Journal of Engineering and Technology*, 4(1), pp. 103-106.
19. The Daily Star (2015). Rethinking the roots of Dhaka's traffic congestion. August 22. Available at: <http://www.thedailystar.net/op-ed/politics/rethinking-the-roots-dhakas-traffic-congestion-130456> (Accessed: 27 December 2015).

Creative Commons licensing terms

Authors will retain copyright to their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Economic and Financial Research shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflict of interests, copyright violations and inappropriate or inaccurate use of any kind content related or integrated on the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).