

Role of Dhaka Metropolitan Police (DMP) in Present Traffic Management System of Dhaka City

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DECLARATION

In accordance with the requirements of the degree of Master in Governance and Development in the Institute of Governance Studies, I present the following dissertation entitled '*Role of Dhaka Metropolitan Police (DMP) in Present Traffic Management System of Dhaka City*'. This work was performed under the supervision of Dr. Zohurul Islam.

I hereby declare that the work submitted in this dissertation is own and based on the results found by survey. Materials of work found by other researcher are mentioned by reference. It is hereby declared that this dissertation or any part of it has not been submitted elsewhere for the award of any degree or diploma

February, 2013

Md. Shamsul Arif

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ABSTRACT

Dhaka, the capital City of Bangladesh and the home of 15 million people, is subjected to acute traffic congestion on a regular basis resulting in lost productivity, fuel wastage, commuter frustration and environmental degradation. The city is perhaps the only megacity with no well organized traffic management system and one of the very few ones without Mass Rapid Transit (MRT). Traffic management is a vital tool for improving the roadway capacity. Traffic management system of Dhaka City is guided by various agencies activities. This is yet another major problem owing to the multiplicity of service providers with unclear and often overlapping mandates. Poor institutional efficiency of the organizations connected with the traffic management system reducing roadway capacity.

Traffic Department of Dhaka Metropolitan police (DMP) is one of the key agencies of present traffic management system functioning control of traffic movement in the city, enforcement of traffic rules to ensure road safety, investigating road accidents, storing of data and the analysis of the accident data.

The objectives of this study are: to identify the present traffic management system in Dhaka City and to assess DMP functions in present traffic management system. The objectives of this study were achieved via a comprehensive literature review, interview survey and finally data collection was conducted via a questionnaire survey with respondents having relation to traffic management.

In analysis it was found that present traffic management system involving different agencies without any coordination. Hence it created a fragile traffic management system with lack of efficiency among agencies.

Traffic police of DMP is one of the key agencies activities has been assessed based on five variables or indicators: parking, lane discipline, footpath and pedestrian crossing, manpower and traffic control and management with other agencies. Through this indicators analysis it is found that DMP role on traffic management is underperforming considering its responsibilities.

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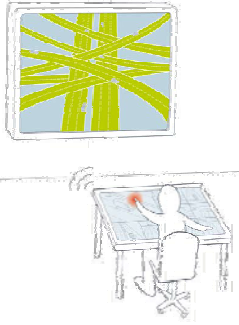
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ACRONYMS

STP	The Strategic Transport Plan for Dhaka
NMT	Non Motorized Transports
MRT	Mass Rapid Transit
RHD	Roads and Highways Department
DTCA	Dhaka Transport Co-ordination Authority
DCC	Dhaka City Corporation
DMP	Dhaka Metropolitan Police
RAJUK	Rajdhani Unnayan Kartipakkha
LGED	Local Government Engineering Department
DoE	Department of Environment
BIWTA	Bangladesh Inland Water Transport Authority
BRTC	Bangladesh Road Transport Corporation
BRTA	Bangladesh Road Transport Authority
DMDP	Dhaka Metropolitan Development Plan
DMP	Dhaka Metropolitan Police
RTMC	Road Traffic Management Corporation
US	United States
OECD	Organisation for Economic Co-operation and Development
FHWA	Federal Highway Authority
TMC	Traffic Management and Control
ACP	Assistant Commissioner of Police
DCP	Deputy Commissioner of Police
DSCC	Dhaka South City Corporation and
DNCC	Dhaka North City Corporation
DIT	Dhaka Improvement Trust
DRTM	Directorate of Road Transport Maintenance
TTS	Traffic Training School
CCTV	Close Circuit TeleVision
ITS	Intelligent Transport System



INTRODUCTION

CHAPTER ONE

INTRODUCTION

1.1 Background

Transportation system is one of the most fundamental components of the socio-economic and physical structure of an urban settlement. A well-planned and developed transportation system not only provides opportunities for mobility of the people, but also influences the growth pattern and the level of economic activity of a city (Meyer and Miller, 1984). **Traffic management** is the planning, monitoring and control or influencing of traffic. It aims to: maximize the effectiveness of the use of existing infrastructure; ensure reliable and safe operation of transport; address environmental goals; and ensure fair allocation of infrastructure space (road space, rail slots, etc.) among competing users (European Communities, 2009). Traffic Management maximizes the use of existing road space, using traffic operations enforcement, materials and equipment to achieve safe and efficient movements.

Dhaka, the capital of Bangladesh is one of the least motorized mega city in the world but most densely populated city with a current population of almost 15 million at annual growth rate of 8% per annum (STP, 2005).¹ The population of the Dhaka Metropolitan Area is presently estimated to be 12 million people (STP, 2005), is the 16th largest city in the world (Ahmed, 2007)², a number that is expected to more than double by 2024. Dhaka was ranked the second least livable city in the world in the Economist's World's Most Livable Cities Index, 2011. Again, due to rapid growth of population in Dhaka, the projected trip generation per day for the next 20 years period is 159.63 million which is about 8 times higher than the current trip generation per day. For such a large city and huge travel demand, mass transit is a prerequisite for its transportation system. Present contribution of mass transit is only 31% of the passenger trips where as mass transit should share 80% of the total trips to provide an efficient transportation system (STP, 2005).

¹ STP means The Strategic Transport Plan for Dhaka which was jointly conducted by The Louis Berger Group Inc. and Bangladesh Consultants Ltd. in the year of 2004.

² The article draws heavily on the book "Making Dhaka Livable" which author is Sadiq Ahmed, Vice Chairman of the Policy Research Institute of Bangladesh. He co-authored with Junaid Ahmad and Adeeb Mahmud. The book was published by UPL, Dhaka in 2007.

Dhaka is perhaps the only city of its size without a well-organized, properly scheduled bus system or any type of mass rapid transit system. The transport modes in metropolitan Dhaka are classified in three major groups on the basis of type of operation and usage. These groups are private transport, para transit and mass transit. Para transit and mass transit together are also termed as urban public transport. Trends showed that growth rate for the low occupancy travel modes such as cars and cycle rickshaws, were much higher than that for high occupancy travel modes such as buses and mini buses. Rickshaw, which is an outdated mode of transport for a populous and fast growing metropolitan area, comprised about 53.3 percent of total vehicles. Where as bus, which is the major travel mode in most of the developing countries, composed only of 2.7 percent (Ahsan, 1990). As a result, major share of road space remains occupied by the small capacity vehicles particularly NMT (70%). Road spaces are also occupied by other than traffic such as dustbins, construction materials, hawkers, etc. and reduce the effective width of roadway. There are no priority measures for bus on the road and bus is the only mass transit option in Dhaka. This transport situation consequently has increased traffic congestion, travel delay, and accident and deteriorating the accessibility, comfort, safety, operational efficiency and environment. The existing traffic congestion is largely caused by inadequate road usage due to a lack of traffic management. An appropriate systematic traffic management system is essential for safety and smooth traffic flows on roads, making a maximum usage of road facilities to enlarge the current road capacities.

The management of the existing road space is badly conceived. There is virtually no control over which vehicles use which roads. Lane discipline does not exist and there is haphazard parking and stopping on the running lanes. There is lack of development coordination between the concerned agencies and overlapping of functions among them. Together, this breakdown in communications and operational service has caused a substantial loss in available capacity. It is estimated that up to 50% of the capacity of the arterial system is wasted due to poor operating conditions (STP, 2005). Proper traffic management measures that can be put in place to re-establish this lost capacity. The Dhaka Metropolitan Police (DMP) has a huge task in taking control of the violations which take place constantly.

1.2 Transport Management Scenario of Dhaka City

Dhaka is perhaps the only mega city with no well organized and properly scheduled public transport system and one of the very few ones without Mass Rapid Transit (MRT). The

public transport modes of Dhaka consist of double-decker bus, single deck large bus, minibus, collective transport (staff bus, school/college/university bus) and rail. A brief overview of the public transport and traffic management system of Dhaka City is provided below.

The number of bus vehicles in the city account for 16% of all motorized vehicles which carry 77% of the population (STP, 2005). Though, the total length of the route is 200 km, only 107 km of the available road are of less than 24 km width and there has been a lack of sufficient connector roads in the east-west direction. Also, several operational weaknesses can be identified in terms of route planning, for example, deficient number of routes, competition of numerous small operators in the same route, absence of fixed schedule and passenger information system, etc. Moreover, no advantage is practiced by these buses in terms of separate right of way or signal priority. Also, the bus passengers are vulnerable to accidents, since the bus drivers often carry false driving license leading to increased congestion and indiscipline in the road.

The deteriorating traffic conditions are causing increasing delays and worsening air pollution, and seriously compromise the ability of the transport sector to serve and sustain economic growth and quality of life. Traffic congestion is an issue of great concern for the inhabitants of the city resulting in commuter's frustration, longer travel times, lost productivity, increased accidents, more fuel consumption, and deterioration in air quality. A recent study by Roads and Highways Department (RHD) has estimated that, the traffic congestion in Dhaka causes a loss of Taka 19,555crore a year (The Daily Star, 2010).

The five key organizations falling within the jurisdiction of the study which activities are important relating to traffic management of Dhaka City: (i) Dhaka Transport Co-ordination Authority (DTCA); (ii) Dhaka City Corporation (DCC); (iii) Dhaka Metropolitan Police (DMP); (iv) Rajdhani Unnayan Kartipakkha (RAJUK); and (v) Bangladesh Road Transport Authority (BRTA). In addition to the five agencies, other key agencies such as Roads and Highways Department (RHD), Local Government Engineering Department (LGED), Department of Environment (DoE), Bangladesh Inland Water Transport Authority (BIWTA) and Bangladesh Road Transport Corporation (BRTC) were also considered since they will also have a major role to play in the urban transport and land use planning process.

The problems relating to the transportation system in Dhaka City have been accumulating for a long time. Amongst the most important reasons are the lack of co-ordination among the agencies involved in transportation; the lack of enforcement of traffic rules, poor safety regulations, and lack of a functional road classification system, poor traffic management and poor institutional efficiency of the organizations connected with the transportation system. In order to improve this situation, the Government initiated various studies including Dhaka Metropolitan Development Plan (DMDP) covering the period 1995-2015 popularly known as “Master Plan for Dhaka”. Unfortunately neither the recommendations of these studies nor the intended integration of transport and land use planning were implemented. Importantly, land use planning, particularly at the strategic level, which is a part and parcel of transport planning remains outside the jurisdiction of DTCA. As a result, the multiplicity of service providers with unclear and often overlapping mandates lead to weak management of traffic in Dhaka City.

1.3 Research Objectives

The objectives of the study are following:

- To identify the present traffic management system in Dhaka City.
- To assess DMP functions in present traffic management system.

1.4 Research Questions

The research questions for this study are:

- What is the present traffic management system prevail in Dhaka City?
- What are the DMP functions in present traffic management system and assessment of functions?

1.5 Rationale of the Research

At the present time, the existing conditions in Dhaka are an example of the absence of good management of existing resources resulting in the chaotic disorder that exists on many roads. Traffic Management maximizes the use of existing road space, using traffic operations enforcement, materials and equipment to achieve safe and efficient movements. One of the major untapped assets of Dhaka is the substantial unused capacity in the existing highway

system that is now being squandered through inappropriate use. Traffic congestion has become unbearable, creating huge delays in covering small distances. There is an increasing risk that the central city may soon get divided into "islands" with little or no connectivity with each other, creating huge loss of productivity and high transaction costs. Traffic management poses serious health risks.

It is obvious that Dhaka City's traffic congestion has reached nightmare proportions. Unless corrective actions are taken soon, there is a risk that this could sharply reduce the city's productivity. In view of Dhaka's dominance, this could reduce the incentive for domestic and foreign investment and pose a serious threat to the country's growth momentum. A longer-term sustained progress in the traffic situation requires a holistic approach to improving the overall city management that aims at making Dhaka more livable.

The current research therefore will identify the present management system, related organizations and their activities specially role of DMP in current management system.

1.6 Scope of the Study

Traffic management would typically comprise several elements, including: traffic engineering, driver training, safety, roadside interference, public awareness and enforcement. It is quite impossible to cover each and every unit of Traffic Management. Moreover, due to time and resource constraints, this research will be confined within present traffic management system, related organizations and Dhaka Metropolitan Police (DMP) functions on present system.

1.7 Limitations

During field work some limitations have to be faced by researcher. These are:

Non-availability of Documents: One challenge is the difficulty in gathering documented information from officials. In some cases documents may not be found readily available and considered confidential.

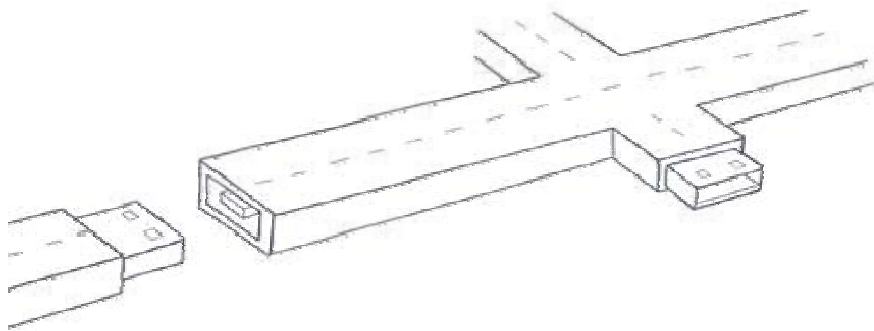
Limited time: Time is another constraint in the field work. The time given for the data collection was too short. During Survey key officials were busy about *Ijtima*. Further, for doing qualitative studies researcher requires more time to analyze data while gathering information. As at times he may need extra time to restructure his design in the light of new

developments and insights. In brief, researcher personally feels that if he had more time than it would have helped to obtain more reliable data.

1.8 Structure of Dissertation

The dissertation begins with an in depth literature review in chapter two examines the concept of traffic management, theory of organizational traffic management performance measures, performance measures focus area/indicators, performance measures indicators for Dhaka City and conceptual framework.

Chapter three provides detail regarding the research methodology selected by the researcher, in an attempt to collect data. This methodology includes both qualitative as well as quantitative methods of data collection. The collected data is disclosed in chapter four, through the use of tables and graphs, as well as other presentation ways. An in depth findings is examined in great detail in this chapter. Chapter five concludes the research and offers recommendations as well as proposed future research topics.



LITERATURE REVIEW

CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Traffic Management

As urban populations expand and city roads become increasingly congested, city planners need comprehensive urban development and transport policies to address deep-seated social and demographic change. According to Road Traffic Management Corporation (RTMC) of South Africa traffic management includes enhancing the overall quality of road traffic services provision, and in particular ensures safety, security, order, discipline and mobility on the roads and protecting road infrastructure and the environment through the adoption and implementation of innovative technology. Traffic management means the management of the existing road space, control over vehicles roads use, lane discipline, parking and stopping on the running lanes (STP, 2005).

Traffic management involves the allocation of infrastructure (road space or train slots on a railway network) according to **strategic operational and policy goals**. These include efficiency, safety, environmental, economic and equity objectives. In real terms, meeting them may encompass measures that include giving priority to buses, trams or other vehicles such as emergency services or high occupancy vehicles, increasing space available for pedestrians and cyclists, or providing shared road space. For rail, rules for market opening, network capacity allocation and pricing also constitute policy-level strategic management.³

Traffic Management maximizes the use of existing road space, using traffic operations enforcement, materials and equipment to achieve safe and efficient movements. An overall traffic management improvement program would typically comprise several elements, including:⁴

³ This publication was produced by the Transport Research Knowledge Centre (TRKC) consortium on behalf of the European Commission's Directorate-General for Energy and Transport. Additional information on transport research programmes and related projects is available on the Transport Research Knowledge Centre website at www.transportresearch.info

⁴ For the relevant evidence and insightful discussion on traffic management several elements, visit the link www.dtvconsultants.eu/Themes/Traffic_management.aspx

- a) **Traffic Engineering:** Enhancements to enable more effective use and management of existing physical infrastructure.
- b) **Driver Training:** Improved testing and licensing procedures for all drivers and retraining for offending drivers.
- c) **Safety:** Redesign of roads and intersections, crossings etc in order to reduce the harmful effects of collisions.
- d) **Roadside Interference:** Measures to reclaim the full potential capacity of the existing road by relocating or removing inappropriate activities from the public right-of-way.
- e) **Public Awareness:** Initiatives to improve the ability of road users to adopt behavioural patterns which lead to more efficient and safer transport services.
- f) **Enforcement:** Increased level of enforcement of traffic rules to ensure a greater compliance with community desired road user behaviour. It also includes road/route use, lane discipline, parking, pedestrian crossing and manpower development.

Dhaka Metropolitan Police (DMP) was set up in the year 1976 through Ordinance No. 3 of 1976. With the gradual expansion of Dhaka caused not only by natural growth but also by in-migration, the maintenance of law and order and control of traffic became extremely difficult. The need to set up a separate organization for the city area was thus felt, which led to the creation of DMP.

The main functions of DMP are:⁵

- ❖ control of crimes and maintenance of law and order in the city.
- ❖ control of traffic movement in the city.
- ❖ enforcement of traffic rules to ensure road safety.
- ❖ investigating road accidents, storing of data and the analysis of the accident data.

Out of the four mandated functions of DMP, the last three are directly related to the enforcement which is an important portion of traffic management.

2.2 Traffic Management Performance Measures of an Organization

Looking at authorities and responsibilities with respect to transport in cities, which can influence the efficiency of traffic management, 3-4 authorities are involved in most cities, with the most common being national, local and city authorities, as well as the police.⁶

⁵ The Dhaka Metropolitan Police Ordinance, 1976 (Ordinance No. III of 1976).

⁶ For evidence on such traffic management performance measures, see Kaparias and Bell. (2010).

Performance assessment is commonly encountered in a number of activities and processes related to engineering, economics, health, and so on. Its definition in this context is straightforward, in that performance essentially refers to how successfully a task, system or operation functions. From this perspective, performance measurement is a task required for assessing and improving characteristics and operations of a system, process, or infrastructure. A comprehensive definition of performance measurement is offered by the US Federal Highway Administration (Shaw, 2003)

“Performance measurement is a process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of government operations in terms of their specific contributions to program objectives.”

Indeed, the road sector involves a number of different stakeholders, often with contradicting interests and expectations. These lead to the need for assessing and measuring various dimensions of performance in this area. Figure 2.1 depicts these perspectives.

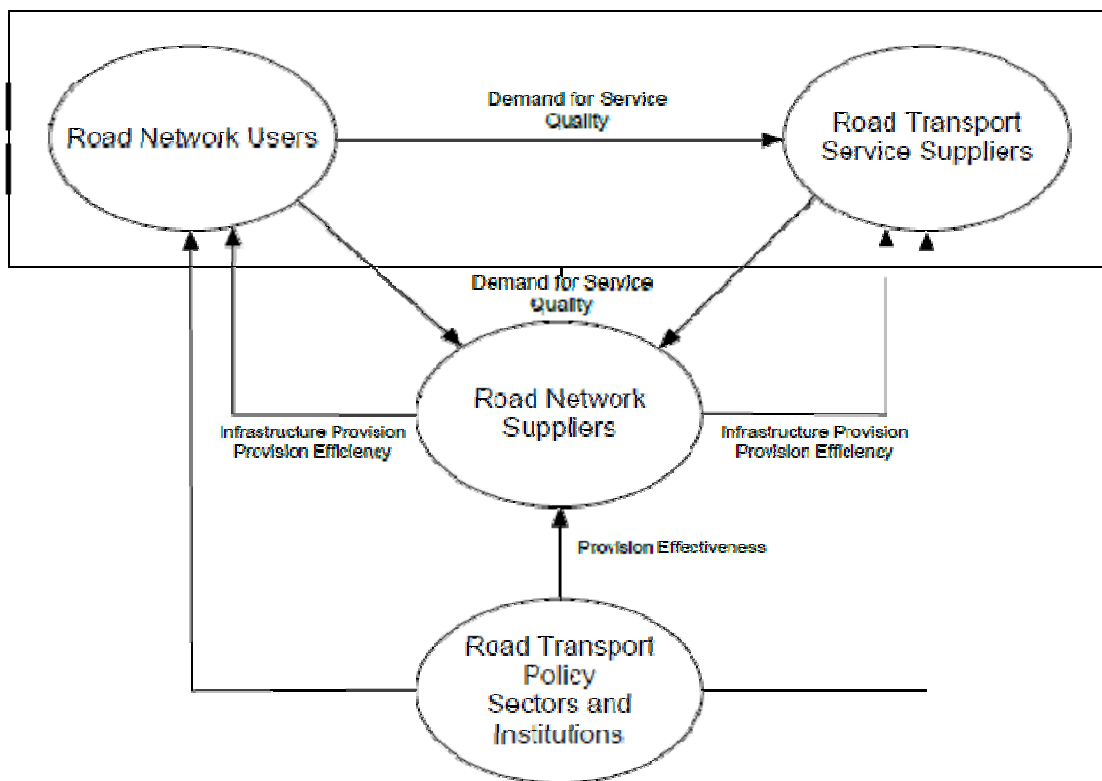


Figure 2.1 Stakeholders in the road sector and performance measurement
(adopted from Humplick and Paterson, 1994)

Road users and service providers (such as bus, coach, taxi, and road freight providers) require “service quality” in terms of comfort, safety, affordable usage cost, and an adequate driving environment (Humplick and Paterson, 1994). Suppliers of the road networks focus on efficiently satisfying user and service requirements and are therefore concerned with the productivity and effectiveness of their operations. Policy makers are primarily interested in the best possible allocation of resources among road network supplies, along with compliance with road network-related rules (Humplick and Paterson, 1994). Compliance of traffic management related to institutional management.

Performance measurement and monitoring significantly impact the development, implementation and management of existing transport plans and programmes, and largely contribute to the identification and assessment of successful alternative programmes and projects. Moreover, performance measurement and monitoring enable obtaining the data necessary to compare the performance of different projects and programmes in future scenarios and to evaluate the performance of the same project and system at different time points.

2.3 Performance Measures Focus Area/Indicators

Performance indicators in the traffic management sector have been widely used by authorities worldwide both in developed and in developing countries. The Organisation for Economic Co-operation and Development (OECD) Scientific Expert Group on Performance Indicators for the Traffic Sector investigated performance measures for the traffic management sector.⁷ The group identified six categories of indicators that are most commonly used in OECD countries:

- Accessibility and mobility
- Traffic safety
- Environment
- Equity and community
- Road program development
- Road program delivery
- Road program performance.

⁷ For more information and details see Field Test of Performance Indicators for the Road Sector. OECD, Paris, 2000.

OECD conceptual model for developing and using performance indicators is following:

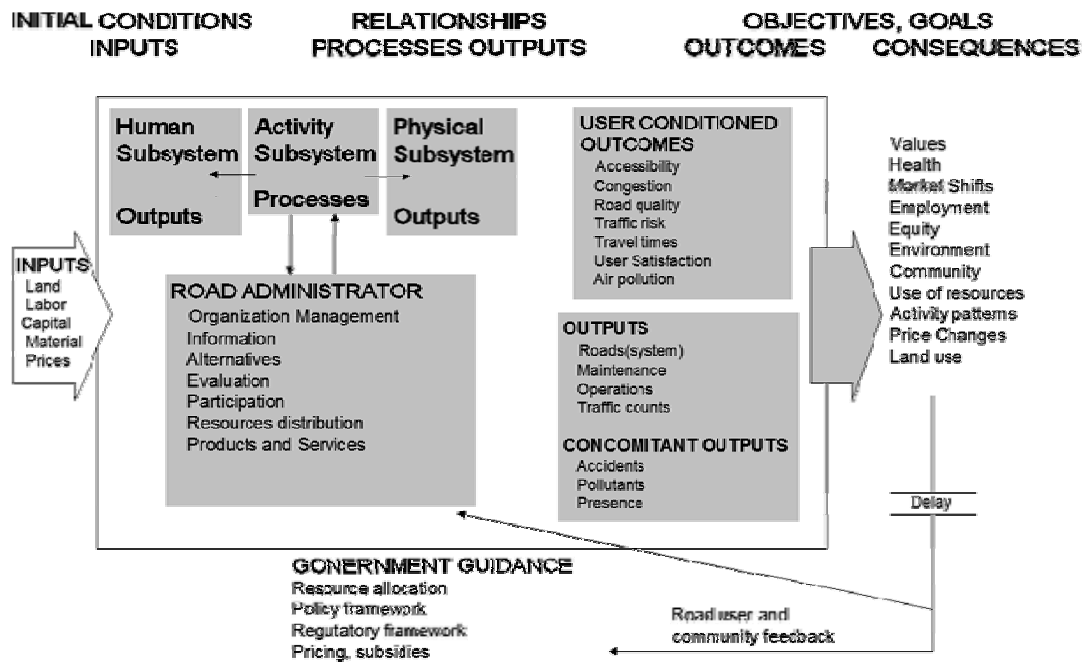


Figure 2.2 OECD conceptual model for developing and using performance indicators (OECD, 1997)

In the above model it is clear that organizational management has relationship with user conditioned outcomes comprising accessibility, congestion, road quality, traffic risk, travel time, user satisfaction and air pollution. These indicators are essential for measuring organizational role in a system.

Federal Highway Authority (FHWA), publications have investigated and presented performance measurement practice and trends in the USA. According to FHWA, indicators were categorized as follows:

- ☒ Accessibility
- ☒ Mobility
- ☒ Economic Development
- ☒ Quality of Life
- ☒ Environmental and Resource Conservation
- ☒ Safety
- ☒ Operational Efficiency
- ☒ System Condition and Performance

These indicators are very much related to standard traffic management system for any country.

Arizona State considered indicators/focus area beyond FHWA indicators. The state considered following indicators:

Table 2.1: Performance measure focus area for Arizona State.

Focus Area	Goals and key performance measures
Freeways	Improve freeway travel times Improve travel time reliability
Arterials	Improve arterial travel times Improve travel time reliability Expand after-hours TMC monitoring
Incident Management	Reduce incident duration Improve incident clearance time Traffic Incident Management Coalition Goals
Safety	Reduce road fatalities Reduce crash rate on urban freeways Reduce bicycle crashes on arterials
Traveler Information	Increase traveler information system usage Expand freeway travel time program
Transit	On-time performance of bus and light rail

Source: Arizona State Traffic Management Department.

In road authorities around the world, common foci for performance measurement include:

- System condition and preservation,
- Safety,
- Accessibility, and
- Mobility.

Interestingly, the environment – its protection and sustainability – is cited as an important goal for most transportation agencies and there is a common desire to be able to measure performance in this regard. However, the identification of effective measures seems to be challenging and further work is necessary in this area.

2.4 Performance Measures Indicators for DMP

International experience shows that the performance of a city is strongly correlated with the underlying city governance. A city's governance essentially involves a sound legal framework assigning rules of business, responsibilities and accountability; a well-defined management structure; clear assignment of responsibility and accountability, and adequate coordination among concerned agencies; financial autonomy; and voice and participation by beneficiaries. An appropriate systematic traffic management system is essential for safety and smooth traffic flows on roads, making a maximum usage of road facilities to enlarge the current road capacities.

- To achieve smooth traffic flow
- To reduce traffic accidents, and
- To create pedestrian –friendly facilities

DMP is responsible for direct and manage traffic flows of Dhaka City according to Clause 25 (b) & (c) of police regulations and clause 17(a) of DMP – ordinance, 1976.⁸ DMP will remain responsible for enforcement of traffic regulations and for prosecuting those who violate these traffic rules. As a result, indicators related to these responsibilities are important for performance measures of DMP. Indicators which assess the performance or role of DMP regarding traffic management are following:

- Parking
- Lane discipline
- Footpath and pedestrian crossing
- Manpower
- Coordination with other agencies

Parking: The haphazard parking of vehicles (both motorized and non-motorized) causes substantial loss of road capacity. The parking on the running lanes creates adverse environmental impacts and a dangerous situation for pedestrian traffic due to obstructed visibility. Provision of valuable road space for the parking of vehicles is a



very inefficient use of space especially where there is limited road capacity available. Over

⁸ The Dhaka Metropolitan Police Ordinance, 1976 (Ordinance No. III of 1976) and Police Regulations, 1943.

the years people have become accustomed to stopping where they choose and leaving the vehicle without thought to the consequences of poor parking. The future city can no longer accept this behaviour.

Lane discipline: At the present time, the driver competence and behaviour patterns in the city are very poor. In addition, the highways have been taken over by traders and others who use the running surfaces for uses other than transportation. This causes traffic congestion and delays and reduces the carrying capacity of the highways. One of the major untapped transport-related assets of Dhaka is the substantial unused traffic capacity in the existing highway system that is now being wasted through inappropriate use and poor driver behaviour.



Footpath and pedestrian crossing: Pedestrians are the most vulnerable of all road users and require special facilities for their protection. Walking is currently a commonly used mode of transport in Dhaka. While walking is a matter of choice and convenience for some people, the reality is that for many people, walking is a matter of economic necessity.

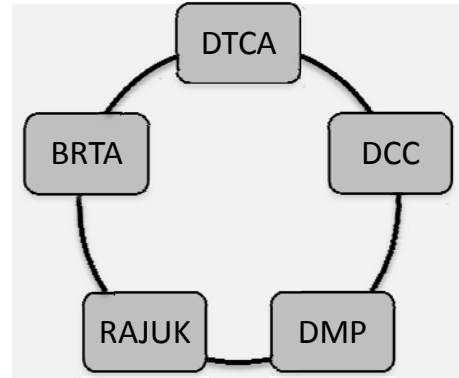


Despite a high proportion of walking trips, suitable pedestrian facilities have traditionally been neglected. The absence of a clearly defined system makes travel by this mode of travel unpleasant and hazardous.

Manpower: All personnel related to traffic management given training on traffic rules and regulations. Arrangement of training is essential for newly posted Sergeants and officers. There will be a need for further procurement of equipment and training to enable this function to be enhanced.



Coordination with other agencies: Coordination among various agencies is an important indicator for organizational performance measures. The five key organizations falling within the jurisdiction of Dhaka City which activities are important relating to traffic management of Dhaka City: (i) Dhaka Transport Co-ordination Authority (DTCA); (ii) Dhaka City Corporation (DCC); (iii) Dhaka Metropolitan Police (DMP); (iv) Rajdhani Unnayan Kartipakkha (RAJUK); and (v) Bangladesh Road Transport Authority (BRTA).



2.5 Conceptual Framework/ Development of Performance Measures

The quantification process is introduced in this section for Key Performance Indicators (KPIs) for traffic management.

An organizational performance KPI, O_{PM} , composed of different elements:

$$O_{PM} = w_P.P_P + w_{LD}.LD_P + w_{FP}.FP_P + w_M.T_M + w_C.P_C$$

Where:

O_{PM} = organizational performance measures

P_P = percentage of parking penalty

LD_P = percentage of lane discipline penalty

FP_P = percentage of footpath and pedestrian crossing violation penalty

T_M = percentage of trained manpower

P_C = percentage of coordination frequency among other agencies

w_P = weight of parking penalty

w_{LD} = weight of lane discipline penalty

w_{FP} = weight of footpath and pedestrian crossing violation penalty

w_M = weight of trained manpower

w_C = weight of coordination frequency among other agencies

If the value of $O_{PM} \geq 1$ (is greater than or equals to one), it could be say that organization is performing its responsibilities correctly. But the value of $O_{PM} < 1$ (is less than one), it could be say that organization is underperforming its responsibilities.

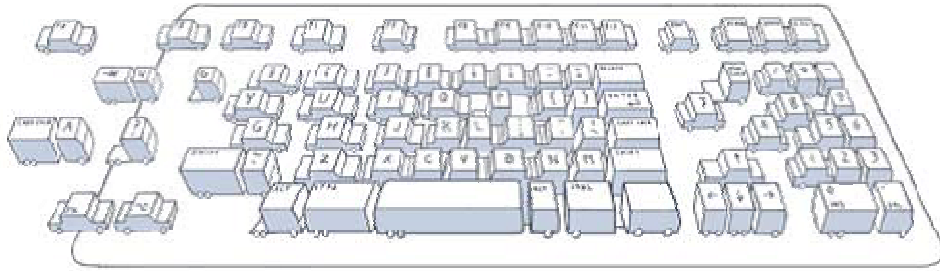
2.5.1 Weighting Variables/Indicators

Variables which are aggregated in a composite indicator have first to be weighted-all variables may be given equal weights or they may be given differing weights which reflect the significance, reliability or other characteristics of the underlying data (Freudenberg, 2003). With the equal weighting approach, there is the risk that certain performance aspects will be double weighted. Greater weight should be given to components which are considered to be more significant in the context of the particular composite indicator.

According to OECD report, another approach is to give less weight to variables that suffer most from missing values in the attempt to partially correct for data problems. The reliability of a composite indicator can be improved by giving more weight to the components with higher quality and availability. All variables weight must be equal to one according to above discussion:

w_i : Weight of the x_i , $\sum_{i=1}^x w_i = 1$, and $0 \leq w_i \leq 1$

In this research, more weight is given to manpower because any organization and system is performing well through its skilled manpower. For this reason, manpower has given $1/3$ of weight and other variables will get equal weights from deducting one to manpower weight.



METHODOLOGY

CHAPTER THREE

METHODOLOGY

The term traffic management is frequently used to refer to and understood as parking control, control of side friction of the roads which are usually demand management approaches. So far, these factors have been given more priority and considerable efforts have been taken as well. On the contrary, supply management approaches are self enforcing, effective and low-cost measures that are not considered for eliminating the congestion problems in Dhaka City. Therefore, this study is undertaken on this management approaches with a view to investigate the applicability of these management regulations of DMP. Figure 3.1 shows the compendium of the study methodology.

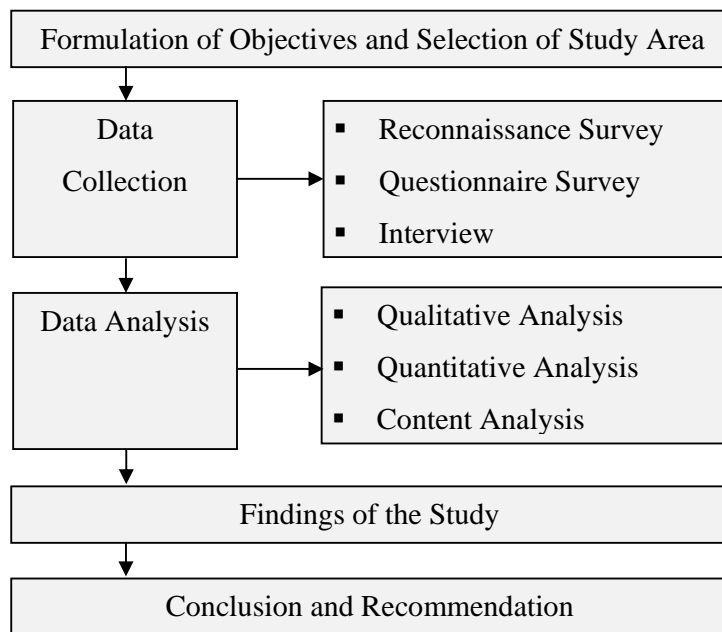


Figure 3.1: Research Methodology.

3.1 Research Design

Research design provides a framework to the researcher to navigate the journey in the field and finally execute the study. The nature of the problem to be studied and research question to be answered are the guiding pillars to decide what approach and strategy would be employed to pursue a research. According to Creswell 2003 research design fall into three categories i) Quantitative ii) Qualitative and iii) Mixed method. The present study utilizes a mixed method approach. The qualitative approach is used as a predominant method because

the research is conducted in its natural setting where the quantitative method will be used to analyze the data.

The mixed method overcomes the disadvantages of qualitative and quantitative methods and benefits from the advantages of each. According to Creswell (2003) one of the main reasons for conducting a qualitative study is that the study is exploratory and the researcher seeks to listen to participants and build a picture based on their experiences and perceptions. In other words qualitative study allows for in-depth analysis of comments and perceptions that individuals such as different stake-holders- Police Officer (traffic), Sergeants hold about the traffic management. Further qualitative approach provides room for discussions between the researcher and participants which allows capturing insights and direct understandings from participant's perspective.

3.1.1 Sampling

The researcher verified per discussion with the research supervisor, that the absolute minimum required number of responses to a Survey of this nature, in order to give it the credibility it requires, would be fifteen. A sample size of forty was set by the researcher based on the desired response rate. The sampling was split among the four categories as per the table below:

Table 3.1: Sampling split per composition.

Category	Rank	Sample size
Traffic North	Sergeants	10
Traffic South	Sergeants	10
Traffic West	Sergeants	10
Traffic East	Sergeants	10
	Grand Total	40

Prosecution data from Sergeants are collected on the basis of an hour prosecution in various time and locations. Sergeants are respondents because this sample group is involved in field level traffic management and prosecution with the help of traffic constable. This research based on prosecution or penalty regarding setting indicators of traffic management. Superior authority is monitoring traffic sergeants for better traffic management. For this reason, other manpower has not been surveyed in this study. Commissioner of Dhaka Metropolitan Police (DMP) would be interviewed separately to know the future plan of Traffic department.

3.1.2 Study Area

Dhaka is capital city of Bangladesh with the functions of administrative, commercial, industrial, educational and cultural centers. It is often called Mega City,⁹ which indicates a large population agglomeration with more than 15 million. More significantly, Dhaka has extremely high density of population. Some areas in the old city area have a population density of more than 1,000 persons per hectare, which causes serious traffic congestion and deterioration of living environment.



Figure 3.2: Map of the Study Area.

The study area is a Dhaka City Corporation Area (DCC) within the area surrounded by Turag River, Balu River and Buriganga River, which is located on the east side of Dhaka District

⁹ The United Nations defines agglomeration of population with 10 million or more as Mega City.

and encompasses Dhaka City, northern side and east district of outer edges of Dhaka City. The demographic trends of the last decade have resulted in rapid population growth. This growth is expected to continue in the coming decades. The impact of such rapid growth has had major consequences on the ability of the transport sector to provide mobility for all people as they seek to take advantage of employment, education, health and social opportunities. The transport sector in Dhaka is composed of many different modes of travel - both motorized and non-motorized. These diverse modes often use the same road space, resulting in a high level of operational disorder. This lack of discipline significantly diminishes the efficiency and effectiveness of the existing transport system.

Table 3.2: Facts about Dhaka City.

Global Location	Latitude: 23 ⁰ 30' - 25 ⁰ 05' N Longitude: 90 ⁰ 15' - 90 ⁰ 35'E
Area	129.85 Square kilometer
Population	15 million
Density	6,545 persons/km ²
Male : Female Ratio	127
Population Growth Rate	8% per year
Gross Domestic Product (GDP)	US \$4.8 billion
Per Capita Income	US \$500
Literacy Rate (Adult)	63.2%

Source: Dhaka City Corporation (North and South) and Bangladesh Bureau of Statistics.

3.1.3 Traffic Police Department of DMP

Traffic police have been functioning since the inception of the Dhaka Metropolitan Police (DMP) in 1976. Even before the establishment of DMP, traffic police used to work under the supervision of the Superintendent of Police, Dhaka district. The origin of modern traffic police can be traced to Dhaka City in 1940s. Horse drawn and rickshaws became so congested that police took control of busy intersections and used to maintain traffic with whistle and by waving arms and hand signals. The advent of the automobile intensified the need for traffic police. Technology improved and automated traffic signals came into play. Traffic police officers spent less time in making sure traffic is kept moving and more time in enforcing laws designed to prevent accidents. It ranges from making drivers wearing seatbelts to cracking down on speeders and other reckless drivers.

The traffic department used to function under a Deputy Commissioner of police in 1976 who was assisted by Assistant Commissioners, Traffic Inspectors and Sergeants. In 1996, positions of two Deputy Commissioners (DC, Traffic North and DC, Traffic South) were created. However, position of an Additional Commissioner, a Joint Commissioner and four Deputy Commissioners were created in 2006. Its total sanction of manpower was also raised to 3,645 in the same year.¹⁰

The primary duty of Traffic department is to maintain smooth flow of traffic in the city. The Traffic Control Room functions round the clock to coordinate with the field units. Assistant Commissioners of Police and their teams consisted of Traffic Inspector, Sergeant and Traffic Constables form the field units.

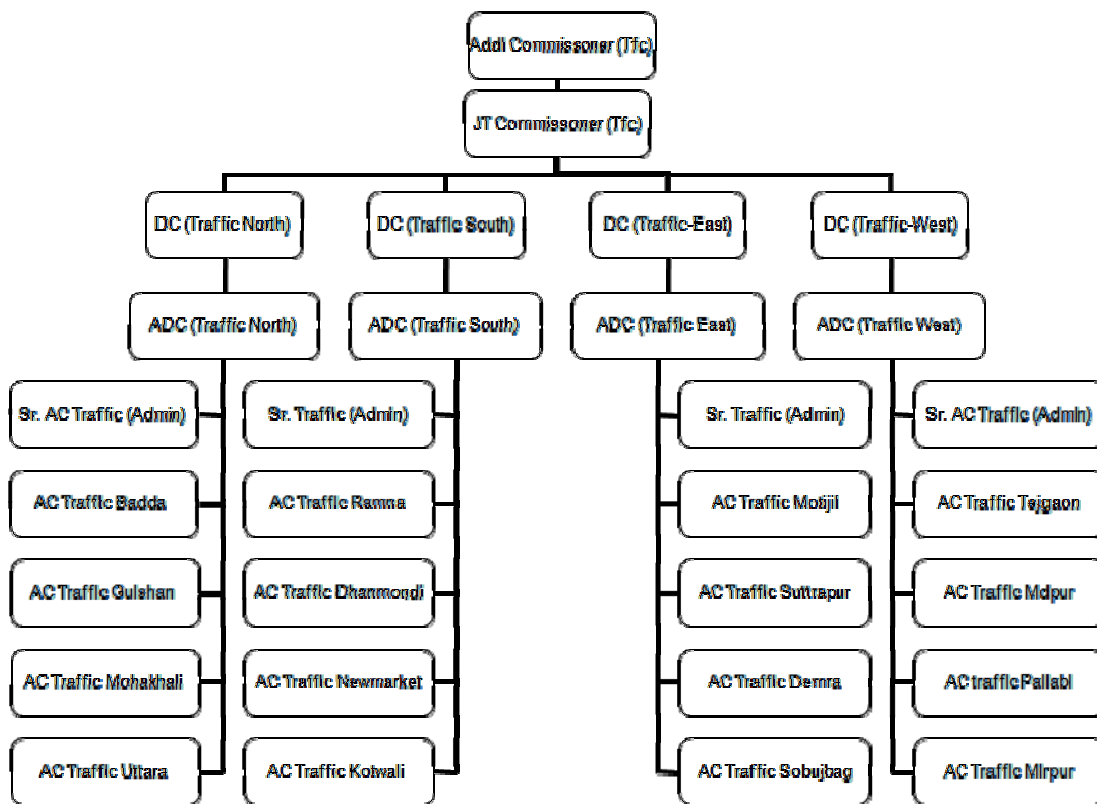


Figure 3.3: Organogram of traffic police department.

3.1.4 Questionnaire Design

Relevancy and accuracy, according to Zikmund (2003), are the two basic criteria a questionnaire must meet if it is to achieve the researcher's purposes. To achieve these ends, a researcher will be required to make several decisions in the order listed below:

¹⁰ For available information see <http://dmptraffic.gov.bd>

- a. What should be asked?
- b. How should each question be phrased?
- c. In what sequence should the questions be arranged?
- d. What questionnaire layout will best serve the research objectives?

The questionnaire comprised of open-ended questions in order to allow respondents to give their views, ideas and actions related to specific laws.

3.2 Data Collection

Questionnaire Survey is an effective method to seek a large sample size for quantitative data analysis. Representative practitioners with experience in traffic management were targeted. The questionnaire aimed to achieve several key features of traffic management including: parking, lane discipline, footpath and pedestrian crossing, manpower and coordination with other agencies.

As with the first objective of the research, content analysis was used to identify the present traffic management system of Dhaka City. For second objective, questionnaire Survey was done among Sergeants, Assistant Commissioner of Police (ACP) and Deputy Commissioner of Police (DCP) of DMP. The key function of the assessment is that to collect information without giving options regarding traffic management especially enforcement. Therefore, open-ended questions were asked to respondents to collect necessary data. Interview was conducted to Commissioner of Dhaka Metropolitan Police regarding two specific questions:

- What your comments about present traffic management system?
- Describe future plan of Traffic department about traffic management?

3.3 Data Processing and Statistical Technique

The qualitative and quantitative analysis is used to analyze data. The open ended questions are analyzed synthetically and statistically.

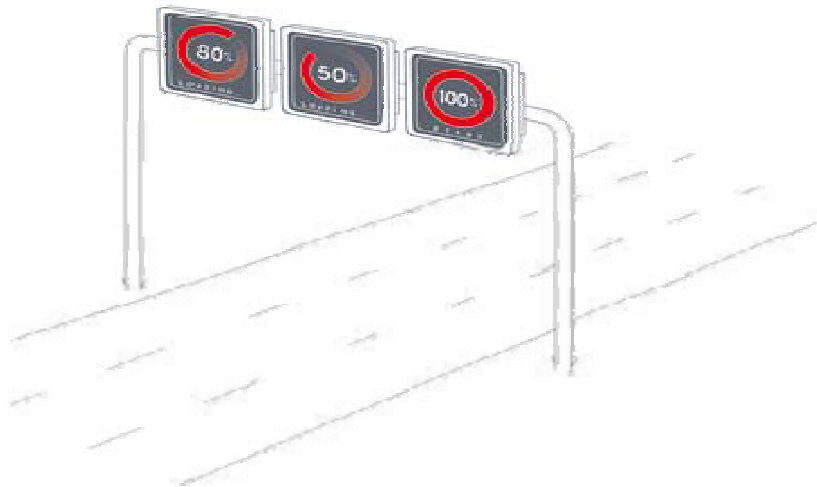
3.3.1 Qualitative Data Analysis

Content analysis is used to determine the present traffic management of Dhaka City. The initial step in content analysis is for the researcher to identify the material to be analyzed. The next step is to determine the form of content analysis to be employed: qualitative, quantitative or structural. The choice is dependent on, if not determined by, the nature of the research project. The choice of categories will also depend upon the issues to be addressed in the

research. Using this approach various research projects, articles, reports were analyzed both individually. Through these process successfully drew the picture of traffic management scenario in Dhaka City.

3.3.2 Quantitative Data Analysis

The quantitative data collected was analyzed using the Excel-07. The techniques that were used in this research study, in respect of quantitative analysis include the organizational performance measure technique.



ANALYSIS AND DISCUSSION

CHAPTER FOUR

ANALYSIS AND DISCUSSION

4.1 Analysis

This chapter details the results of the raw data collected from the interviews and Surveys conducted in this research. The data is presented around the themes explored by the research questions. Sub sections have been used, where necessary, to disclose insights around the main research themes. For the purpose of clarity and transparency, the results have been divided according to the two objectives of the research.

4.1.1 Present Traffic Management System in Dhaka City

The five key organizations falling within present traffic management system of Dhaka City are:

- ▣ Dhaka Transport Co-ordination Authority (DTCA);
- ▣ Dhaka City Corporation (DCC);
- ▣ Dhaka Metropolitan Police (DMP);
- ▣ Rajdhani Unnayan Kartipakkha (RAJUK); and
- ▣ Bangladesh Road Transport Authority (BRTA).

In addition to the five agencies, other key agencies such as Roads and Highways Department (RHD), Local Government Engineering Department (LGED), Department of Environment (DoE), Bangladesh Inland Water Transport Authority (BIWTA) and Bangladesh Road Transport Corporation (BRTC) were also considered since they will also have a major role to play in the urban transport and land use planning process.

4.1.1.1 Dhaka Transport Co-ordination Authority (DTCA)

In the early 1990s a comprehensive transport study named Dhaka Integrated Transport Study (DITS) was conducted. The scope of the study was to investigate all the transport related problems in Dhaka Metropolitan Area (DMA) and suggest solutions. Following this, the Dhaka Urban Transport Project (DUTP) was formulated to consider the immediate implementable activities. DTCA emerged in 1998 (Name was amended in 2001) to meet a requirement by the suggestion of the project DUTP. The jurisdiction today under DTCA is the delineated area by Strategic Transport Plan (2005) that covers districts of Dhaka,

Narayangonj, Munshigonj, Mankgonj, Gazipur and Narsingdi. To manage these areas, DTCA follows its own act named as Dhaka Transport Coordination Authority Act, 2001. The key responsibilities of DTCA include:¹¹

1. Formulation of Strategic Transport Planning and Urban Transport Policy;
2. Coordination of transport related activities in the DMA;
3. Setting Public Transport Policies and Guidelines;
4. Traffic Management Planning and Monitoring; and
5. Traffic Safety Initiatives.

4.1.1.2 Dhaka City Corporation (DCC)

The city of Dhaka was established about 400 years ago. With the passage of time the city has grown in size and complexity. To meet the needs of the city dwellers, Dhaka Municipality was established in 1864. In 1978 the Municipality was upgraded to the status of a Corporation and it was renamed Dhaka Municipal Corporation. Later, in 1990, it was again renamed, this time as Dhaka City Corporation. The Local Government (City Corporation) (Amendment) Act, 2011(Act No. 22 of 2011), Dhaka City Corporation has divided as Dhaka South City Corporation (DSCC) and Dhaka North City Corporation (DNCC) on 04 December, 2011.¹² There are three major areas of work for which Dhaka City Corporation is responsible and which are important to traffic management. These are:

1. Maintenance and development of the city streets/roads/lanes
2. Maintenance and operation of street lights and traffic signals
3. Sweeping and clearing of streets, roads, lanes, drains, markets and public places

4.1.1.3 Dhaka Metropolitan Police (DMP)

Dhaka Metropolitan Police (DMP) was raised on 28 February 1976 and its jurisdiction is the entire area of the Dhaka South City Corporation (DSCC), Dhaka North City Corporation (DNCC) and part of the Dhaka district administration. DMP functions under the administrative control of the Police Head Quarter and the Ministry of Home Affairs.¹³ The main functions of DMP regarding traffic management are:

¹¹ For more information please see www.dtcg.gov.bd

¹² For detail information see www.dhakacity.org

¹³ See www.dmptraffic.gov.bd

1. Control of traffic movement in the city.
2. Enforcement of traffic rules to ensure road safety.
3. Investigating road accidents, storing of data and the analysis of the accident data.

4.1.1.4 Rajdhani Unnayan Kartipakkha (RAJUK)

Dhaka Improvement Trust (DIT) was the predecessor of Rajdhani Unnayan Kartipakkha (RAJUK) and came into existence in 1956 under the Town Improvement Act, 1953. DIT was set up to provide for the development and expansion of the towns of Dhaka and Narayanganj and other areas in their vicinity. Their chartered functions included opening up congested areas, laying out or altering streets, constructing new roads, providing open spaces, demolishing or re-constructing buildings, acquiring land for housing and re-housing of persons displaced due to implementation of development schemes. In addition to the previous duties given to DIT, RAJUK was made responsible for planning including the preparation of the Master Plan for Dhaka in order to make Dhaka a worthy seat for the capital of Bangladesh. The major functions of RAJUK are:

1. Preparation of Master Plan and Development Plan for Dhaka Metropolitan Area.
2. Land Use Planning and Zoning Control.
3. Detailed Area Planning.
4. Planning and construction of new major roads, link roads, bridges and culverts.
5. Planned housing areas within the city.
6. Satellite Town Development.
7. Approval of building plans
8. Construction of markets and shopping centers.
9. Implementation of special projects.

4.1.1.5 Bangladesh Road Transport Authority (BRTA)

In the past, matters relating to the granting of motor vehicle driving licenses, vehicle registrations, fitness certificates and route permits were administered under the Motor Vehicles Act, 1939 (Act IV of 1939). In 1983, the old act was repealed and a new Ordinance (The Motor Vehicles Ordinance, 1983 [Ordinance No. LV of 1983]) was promulgated. Under section 2A of Motor Vehicle Ordinance 1983, (Amendment-1987) vide Statutory Regulatory Order (SRO) No-303/Law/87/MVRT/1E-7/84(part), dated 20/12/87, Bangladesh Road

Transport Authority (BRTA) was established in 1988 and the former Directorate of Road Transport Maintenance (DRTM) was abolished.¹⁴ The main functions of BRTA are:

1. Regulation and registration of motor vehicles in Bangladesh.
2. Issuance of driving licenses to individuals.
3. Issuance of route permits for transport vehicles.
4. Issuance of certificates of roadworthiness for motor vehicles.
5. Identification of new bus routes and public transport services.
6. Identification of defective and faulty vehicles.
7. Responsibility for road safety and the control of overloading of trucks.
8. Formulation of rules and guidelines for motorized transport in general.
9. Inspection of government vehicles.
10. Inspection of vehicles involved in road collisions.
11. Registration of driver training schools and maintenance workshops.

4.1.1.6 Present Coordination System in Dhaka City Traffic Management

At present the land use planning functions are separated from the transportation planning functions. Whereas RAJUK has developed the Structure Plan and is responsible for its implementation, the transportation functions are divided among BRTA, DTCA, DCC and the Police. The planning control function which should be part of the overall planning process is ostensibly being looked after by RAJUK but there is little evidence that this function is being exercised. The lack of a close relationship between land use planning and transportation planning is evidenced by the somewhat haphazard types of development which do take place often out of accordance with the Structure Plan. This leads to poorly served developments since the transportation infrastructure is not available when the development is opened. The situation is made worse when uncontrolled development is allowed to happen, seemingly without the will and ability to control it.

¹⁴ More information, visit <http://www.brta.gov.bd>

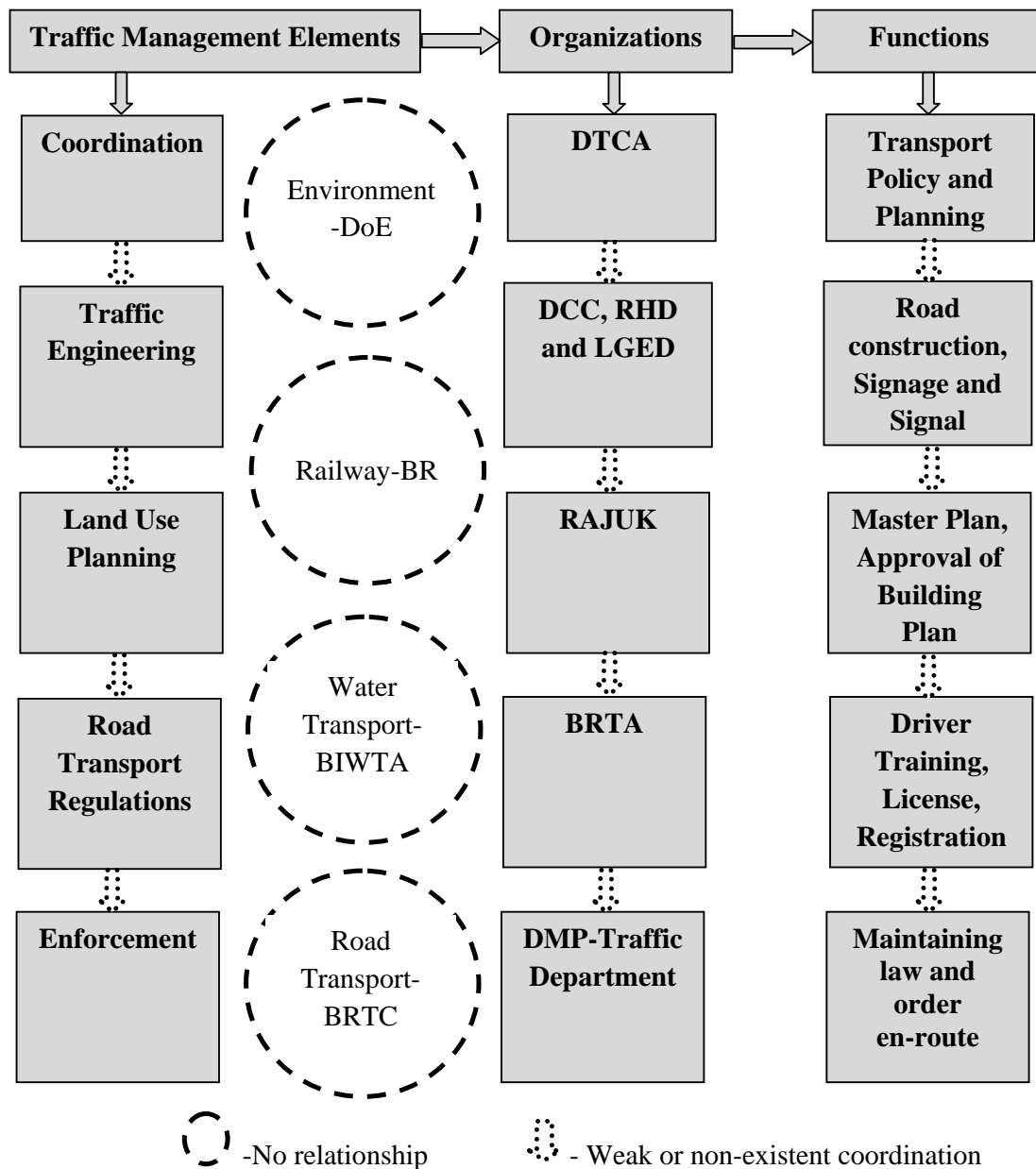


Figure 4.1: Present coordination system in Dhaka City transport management

4.1.2 Assessment of Traffic Department functions of DMP

The primary duty of Traffic department is to maintain smooth flow of traffic in the city. The Traffic Control Room should functions round the clock to coordinate with the field units. Assistant Commissioners of Police and their teams consisted of Traffic Inspector, Sergeant and Traffic Constables form the field units. These units indeed implement the policing with regard to traffic in the city. In discharging its duties smoothly and professionally, traffic department should keep rapport and liaison with the Ministry of Communication, Dhaka City

Corporation (DCC), Bangladesh Road Transport Authority (BRTA) and other concerned authorities.

4.1.2.1 Parking

The haphazard parking of vehicles (both motorized and non-motorized) causes substantial loss of road capacity. The parking on the running lanes creates adverse environmental impacts and a dangerous situation for pedestrian traffic due to obstructed visibility. Provision of valuable road space for the parking of vehicles is a very inefficient use of space especially where there is limited road capacity available. Over the years people have become accustomed to stopping where they choose and leaving the vehicle without thought to the consequences of poor parking. The future city can no longer accept this behaviour. Survey analysis shows that picture in the case of traffic sergeants about knowledge of illegal parking as well as action of those illegal parking.

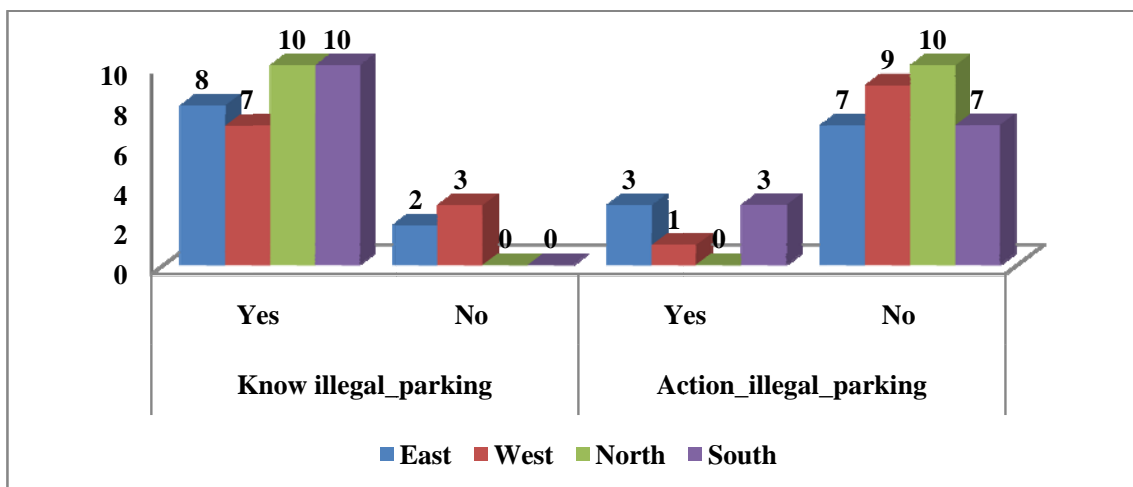


Figure 4.2: Traffic zone wise illegal parking knowledge and action.

It will be clearer comparing with prosecution of different zones of an hour.

Table 4.1: Traffic zone wise illegal parking prosecution in an hour of Sergeants.

Serial No.	Traffic Zone	No. frequency	No. of prosecution per zone	Percentage
1	East	10	3	7.5%
2	West	10	1	2.5%
3	North	10	0	0%
4	South	10	4	10%
Total		40	8	20%

Source: Field Survey, 2013.

4.1.2.2 Lane Discipline

Lane discipline does not exist and there is haphazard parking and stopping on the running lanes. Following analysis depicts the picture of maintenance of lane discipline various traffic zone of Dhaka City.

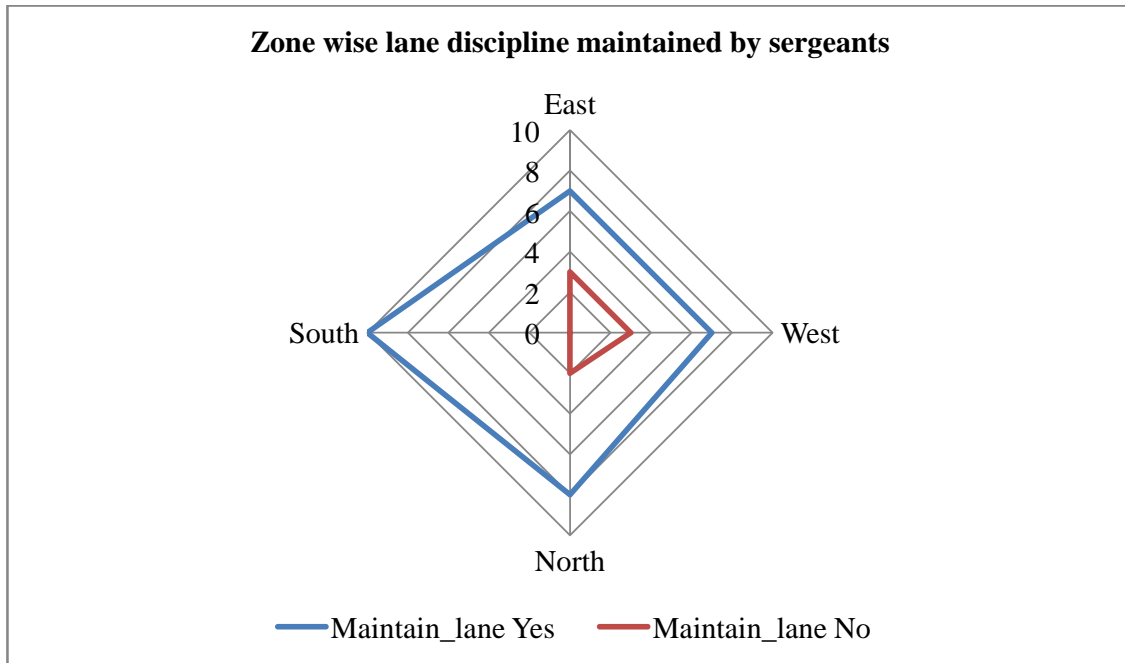


Figure 4.3: Zone wise lane discipline maintained by Sergeants.

South zone of traffic is able to maintain lane discipline. On the other hand east, west and north zone lane discipline maintenance is not firmly well enough. Sergeants are penalizing offenders due to violation of lane discipline. The following table presented it:

Table 4.2: Traffic zone wise lane discipline prosecution in an hour of Sergeants.

Serial No.	Traffic Zone	No. frequency	No. of prosecution per zone	Percentage
1	East	10	9	22.5%
2	West	10	8	20%
3	North	10	9	22.5%
4	South	10	7	17.5%
Total		40	33	82.5%

Source: Field Survey, 2013.

Lane discipline violation is occurring every now and then and sometimes it could not possible for sergeants to penalize offenders due to available space in the road. In some cases penalizing also reduced road capacity stopping vehicles in wrong place.

4.1.2.3 Footpath and Pedestrian Crossing

Pedestrians are of vital importance to a city and yet face many obstacles to their safe, easy and convenient movement. Those problems cannot be adequately addressed without first giving pedestrians priority within urban and transport planning. Lots of vehicles are passed through pedestrian crossing without considering traffic police “STOP” signal. Current study analysis reflected that statement:

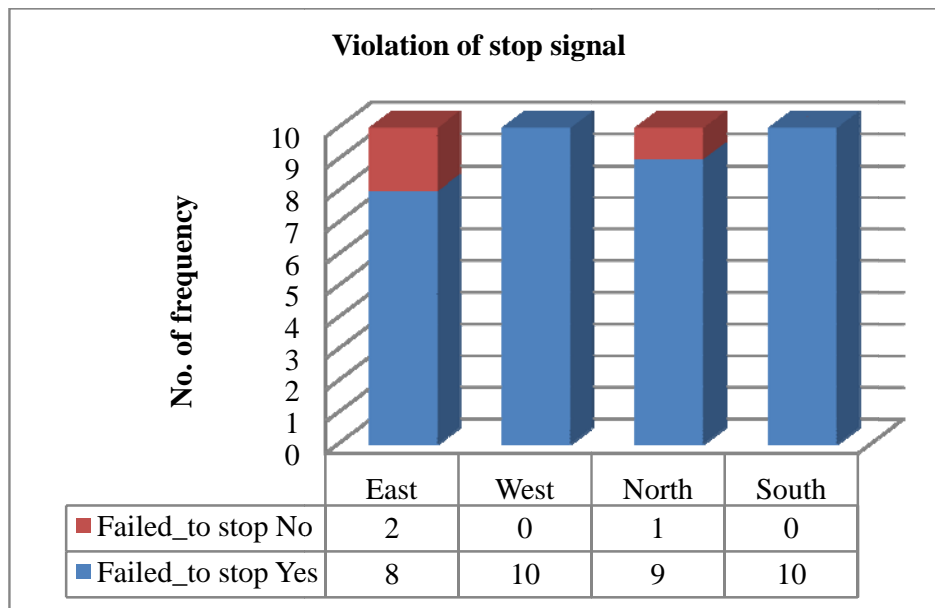


Figure 4.4: Zone wise scenario of vehicles disobey pattern of traffic “STOP” signal.

Both west and south zone 10 out of 10 vehicles are stopped in traffic police signal whereas 2 vehicles in east and 1 vehicle in north zone obey the signal. It is also difficult for traffic police to penalize those vehicles who did not stop in signal. However, traffic police penalize offenders through prosecution under The Motor Vehicles Ordinance, 1983 (Ordinance No. LV of 1983). Zone wise penalizing offenders picture are depicted in following table:

Table 4.3: Traffic zone wise pedestrian crossing prosecution in an hour of Sergeants.

Serial No.	Traffic Zone	No. frequency	No. of prosecution per zone	Percentage
1	East	10	9	22.5%
2	West	10	7	17.5%
3	North	10	7	17.5%
4	South	10	9	22.5%
Total		40	33	80%

Source: Field Survey, 2013.

Pedestrian-friendly environments encourage more people to walk in footpath as a regular mode of travel, creating social, lively streets while reducing traffic congestion. But most of the footpaths are obstructed by various *hawker*, construction materials, parking, motorcycle driving and many other activities.

Table 4.4: Traffic zone wise action taken against obstructions in footpaths.

Serial No.	Traffic Zone	No. frequency	Action taken against obstructions in footpaths		Percentage
			Yes	No	
1	East	10	0	10	0%
2	West	10	2	8	5%
3	North	10	0	10	0%
4	South	10	0	10	0%
Total		40	2	38	5%

Source: Field Survey, 2013.

Above table depicts the scenario of action against obstruction in footpath which is only 5% out 40 respondents. It is essential to know about the 5% respondent's action against those obstructions. All of the respondents are not prosecuted any person though they obstructed in footpaths. However, respondents are able to take away obstruction material from the footpaths.

4.1.2.4 Manpower

According to service rules, every traffic police member must have a Traffic Training School (TTS) certificate.

Table 4.5: Manpower of traffic department in DMP.

	Addl CP	JC	DC	ADC	AC	TI	Sgt	SI	ASI	HC	Const	Total
Sanctioned	1	1	4	4	21	80	856	8	120	200	2354	3649
Actual	1	1	4	4	15	71	643	22	121	159	2317	3358
Shortage	-	-	-	-	6	9	213	-	-	41	37	308
Excess	-	-	-	-	-	-	-	16	1	-	-	17

AC-Assistant Commissioner, ADC- Additional Deputy Commissioner, Addl CP -Additional Commissioner of Police, ASI-Assistant Sub Inspector, Const-Constable, DC-Deputy Commissioner, HC-Head Constable, JC-Joint Commissioner, Sgt-Sergeant, SI-Sub Inspector, TI-Traffic Inspector.

Source: Traffic Department, DMP (Updated on 4 Apr 2012).

The maiden TTS of the country, located at Mill Barrack in the city, cannot train more than 150 members in a single training session. A TTS certificate requires completion of a 42-day course by the participant.

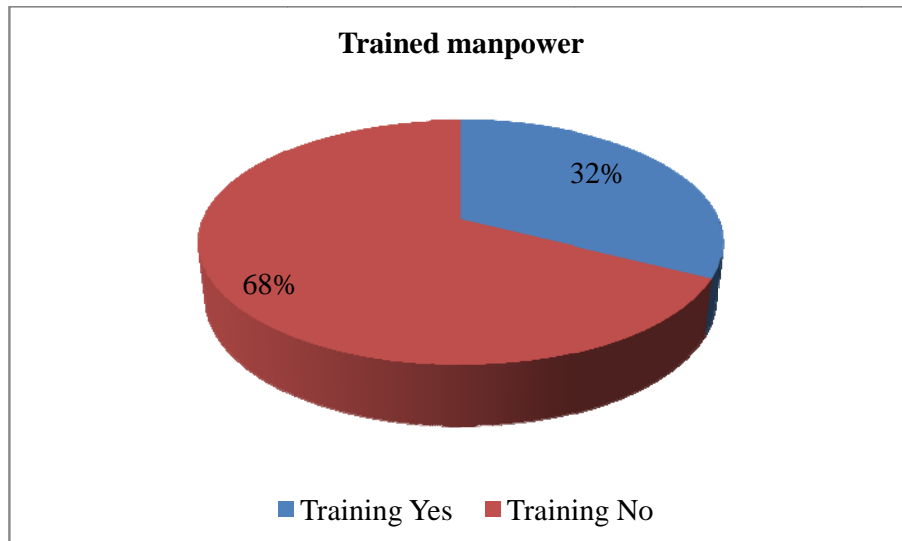


Figure 4.5: Trained manpower among respondents.

Above figure it is obvious that only 32% respondents completed 42-day course from TTS. Such untrained sergeants often park their motorcycle in the middle of the road to stop a vehicle and defame the whole traffic wing by violating traffic rules. Traffic police use following equipments for traffic management activities:

- wheel lock
- speedo meter
- road block
- vehicle scanner
- e-prosecution

4.1.2.5 Traffic Control and Management

DMP telecom division sources they have spent a total of taka 54 crore for the project from 1998 to 2009. The DMP has already set up 155 Close Circuit TeleVision (CCTV) cameras at 60 road crossings and 31 traffic display boards at 31 major points in the city. The very purpose of the project is to improve the law enforcer's ability to monitor and control the flow of traffic resulting in the improvement of vehicular movement on the streets, and also making it easier for the police to get to crime spots. Dhaka Metropolitan Police (DMP) has failed to

use closed-circuit television (CCTV) cameras to curb crimes in the city streets. Still the traffic control room functions round the clock to coordinate with the field units.

Traffic management of Dhaka City is done without any coordination among various agencies. DMP is maintaining same strategy regarding traffic management of Dhaka City. One of the examples is traffic case management system. Now the traffic police entry the case manually. They have no software to store the case records. If the police want to entry any case against any vehicle or driver then first they fill up a case form. They give one copy of case slip to the driver. They send another case slip to the police box. The police of that police box check the case and send it to the nearest Thana. In the Thana the case is stored in a case record book. When the record is stored the whole documents about the default vehicle is send to the traffic police via police box. This is a very lengthy process to update a case. Sometimes the traffic police found a case against any vehicle after 7-10 days. The traffic police also face many troubles to check the case against any vehicle. The traffic police have a case record book. Here the cases are not stored in sorted. For this reason if any police want to see the case record against any vehicle then they have to look the whole case book. The whole existing case entry process is showed below.

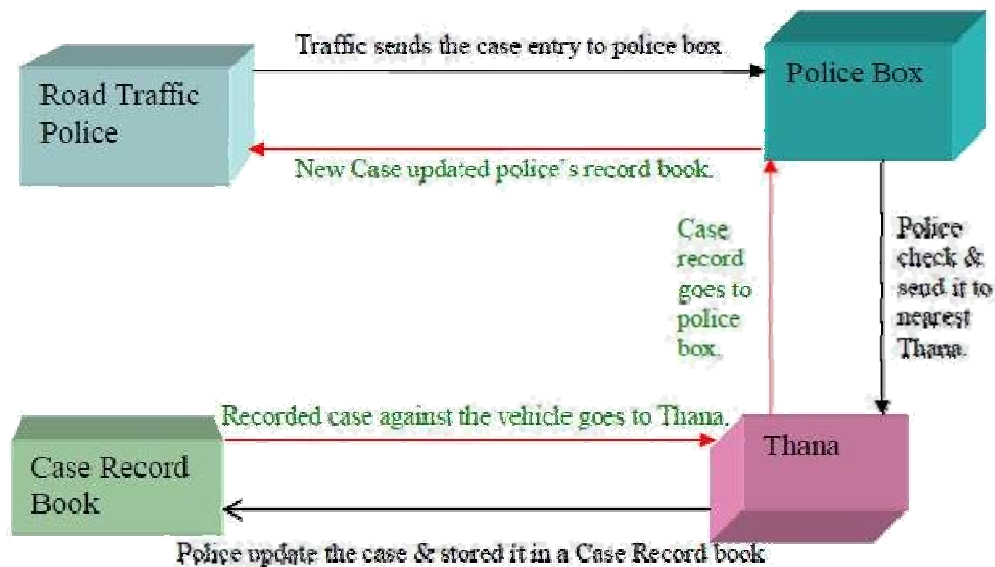


Figure 4.6: Existing system of case entry and updated to the police record book.

In the above mention activity it is clear that traffic police has no coordination among other agencies like BRTA. Therefore, coordination has not taken among the agencies activities.

4.1.2.6 Organizational Performance of DMP

An organizational performance KPI, O_{PM} , can be measured by following formula:

$$O_{PM} = w_P \cdot P_P + w_{LD} \cdot LD_P + w_{FP} \cdot FP_P + w_M \cdot T_M + w_C \cdot P_C$$

Where:

O_{PM} = organizational performance measures

P_P = percentage of parking penalty

LD_P = percentage of lane discipline penalty

FP_P = percentage of footpath and pedestrian crossing violation penalty

T_M = percentage of trained manpower

P_C = percentage of coordination frequency among other agencies

w_P = weight of parking penalty

w_{LD} = weight of lane discipline penalty

w_{FP} = weight of footpath and pedestrian crossing violation penalty

w_M = weight of trained manpower

w_C = weight of coordination frequency among other agencies

It is important to get percentage of various indicators such as percentage of parking penalty, percentage of lane discipline penalty, percentage of footpath and pedestrian crossing violation penalty, percentage of trained manpower and percentage of coordination frequency among other agencies. It has been done in above analysis of parking, lane discipline, footpath and pedestrian crossing, trained manpower and coordination among other agencies. Therefore, the percentages of various indicators are:

Table 4.6: Percentage of various performance indicators.

Sl. No	Indicators	Percentage
1	Parking penalty (P_P)	20%
2	Lane discipline penalty (LD_P)	80%
3	Footpath and pedestrian crossing violation penalty (FP_P)	5%
4	Trained manpower (T_M)	32%
5	Coordination frequency among other agencies (P_C)	0%

Source: Field Survey, 2013.

Weight will be calculated from following formula:

w_i : Weight of the x_i , $\sum_{i=1}^x w_i = 1$, and $0 \leq w_i \leq 1$

In this analysis, more weight is given to manpower because any organization and system is performing well through its skilled manpower. For this reason, manpower has given $\frac{1}{3}$ of the weight and other four variables will get equal weights from deducting one to manpower weight. Therefore other variables will get weight equals to:

$$(1 - \frac{1}{3}) \div 4 = \frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$$

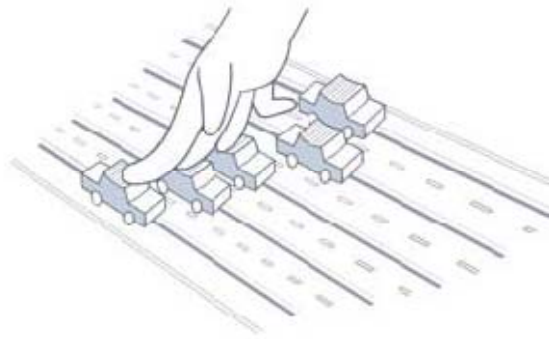
Now both weight and percentage of each indicator put in formula:

$$\begin{aligned} O_{PM} &= w_P.P_P + w_{LD}.LD_P + w_{FP}.FP_P + w_M.T_M + w_C.P_C \\ &= \frac{1}{6} \times 20\% + \frac{1}{6} \times 80\% + \frac{1}{6} \times 5\% + \frac{1}{3} \times 32\% + \frac{1}{6} \times 0\% \\ &= 0.17 \times 0.20 + 0.17 \times 0.80 + 0.17 \times 0.05 + 0.33 \times 0.32 + 0.17 \times 0 \\ &= 0.034 + 0.136 + 0.0085 + 0.1056 + 0 \\ &= 0.2841 > 1, \text{ which is less than 1.} \end{aligned}$$

4.2 Findings

This section presents the findings of questionnaire survey undertaken to study of traffic management system in Dhaka City and also assessment of DMP functions in traffic management. According to analysis, it is found that present traffic management involved different agencies but unfortunately these organizations are not coordinated properly due to lack of coordination responsibility or lack of coordination authority. DTCA has got responsibility but conflict between various issues makes it unsuccessful organization.

Another important analysis is DMP role in traffic management system. DMP is the only legal organization who can enforce traffic rules according to law. However, DMP is using its most of the time to control traffic without or lack of expertise, technology and equipments. This activity let the organization down resulted underperforming its original responsibility. Analysis shows that DMP performance value regarding enforcement is 0.2841 is far less than its targeted value one or more than one.



**CONCLUSION
AND
RECOMMENDATIONS**

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Recommendations

Although Dhaka has already become a city of disorganized road network and mixed land-use pattern due to faulty planning, still some corrective measures may be taken by a strong regulation authority like RAJUK, DTCA, and DMP through strict control of the land-use for existing or for any new residential or commercial area to prevent indiscipline trip generation, attraction and distribution. It is understandable that resolving the problem of traffic management in Dhaka City is not possible within a short time.

5.1.1 A Unitary Authority

At present land use planning functions are separated from transportation planning functions. Whereas RAJUK has developed the Structure Plan and is responsible for its implementation, the transportation and traffic planning functions are divided among BRTA, DTCA, DCC and the DMP. At the same time, traffic control and transport management are being performed by different organizations such as DCC, DMP and BRTA. Formation a unified authority will be responsible for both land use planning and transportation planning in the area of Dhaka City.

5.1.2 Inter-Agency Coordination

There should be more coordination between Ministry of Commerce, DMP, BRTA, DoE and DTCA about various aspects of traffic management like the type, number and age of vehicles being imported, vehicle registration, driving license, bus route etc. BR, BIWTA and BTRC along with many other operators will maintain close liaison with DTCA in order to ensure that the various public transport systems are properly and efficiently integrated. RHD and LGED will assisting the DTCB and DCC in setting design standards for strategic highways and city roads and will adopt best practices in the building of highways.

5.1.3 Traffic Management and Control

DCC should formulate rules and regulation under section 121 (2) of The Local Government (City Corporation) (Amendment) Act, 2011(Act No. 22 of 2011), in respect of traffic management and control. The police should be relieved of their duties to direct and manage traffic flows. Instead this function will be transferred to DCC under section 41 (b) and (c) of The Local Government (City Corporation) (Amendment) Act, 2011(Act No. 22 of 2011).

Accordingly, clause 25 (b) and (c) of Police Regulations, 1943 and clause 17 (a) of The Dhaka Metropolitan Police Ordinance, 1976 should be amended.

Traffic Engineering Department of DCC will be responsible for the control of all traffic signals within the City boundaries, their proper functioning and the optimization of their timing.

5.1.4 Traffic Management Database

There is no central database for traffic, road incidents, registration of vehicles, driving licenses etc. which can be shared with the concerned agencies. There should be a focal point and an organization, which will be posted with all the relevant information and will have general control over traffic management, transportation and land use planning.

5.1.5 Training and Resources

All personnel should be given training on traffic rules and regulations. This should be a continuous process for newly posted Sergeants and officers. The Metropolitan police force should be strengthened in order to allow them to perform their main function of law enforcement and arrest. There will be a need for further procurement of equipment and training to enable this function to be enhanced.

5.1.6 Penalties and Violations

Effective rules for the imposition of penalties for dangerous driving do not exist. Many aspects of driver behavior such as changes of lanes, failure to stop at stop lines, violations of pedestrian crossings should have increased prominence and more effective enforcement against offenders.

5.1.7 Safety

DMP will liaise with DTCA, BRTA and the Road Safety Cell to create a new Pro-forma for incident investigations and recording and officers will be trained in the use of forms for use at the scene of the incident. All information will be transferred daily to the main database administered by the Road Safety Cell of BRTA.

Moreover, various strategies such as Bus Rapid Transit (BRT), Mass Rapid Transit (MRT), Fly over, Intelligent Transport System (ITS) and Elevated express way suggested in Strategic Transport Planning (STP), 2005 should implemented as early as possible. To reduce traffic congestion in Dhaka City, the most vital prerequisite is the development of public

consciousness. Unless and until citizen change their perception and develop a mind to abide traffic rules, whatever strategy will adopt, that will not work properly.

5.2 Conclusion

All these problems are the consequences of the combined effect of unplanned road network and uncontrolled land use which are again interlinked with each other and these are in fact the problems that will be faced in implementing any management regulation in Dhaka City under prevailing traffic management system. No management regulations can be actually successful under the prevailing condition. To conclude, the long-term resolution of Dhaka's traffic management problem must be inter-linked with a strategy for reforming the management authority. A clear vision about the transformation of the city, say in the next 10 years or less, backed by a well thought-out strategy, a time-bound action plan and a credible implementation mechanism are all essential. At the heart of the strategy should be the establishment of a unitary authority that has well defined responsibilities, financial autonomy and is fully accountable to its residents. Achieving this will require strong political will and leadership from the top.



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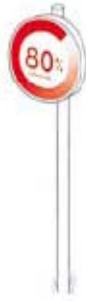
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APPENDIX

**QUESTIONNAIRE ON ROLE OF DMP IN PRESENT TRAFFIC MANAGEMENT SYSTEM
OF DHAKA CITY**

PART-A (General information)

Name of Respondent: Age:
Sex: Education: Contact no:
Rank: Name of working station:
Service length:

PART-B (Only for Traffic Police)

Parking

1. Do you know about legal and illegal parking?
a. Yes b. No

2. If yes, what actions will you take against illegal parking?

3. How many cases are filed or penalties made every day against illegal parking?

4. Please provide any additional information about the parking of the city.

Lane discipline

5. Do you maintain lane discipline during traffic control?
Yes b. No

6. If no, why you cannot maintain lane discipline?

7. Do you penalize the offenders for frequent changes of lanes?

Yes b. No

8. If yes, what types of penalties are applied for violations of lane discipline?

9. Please provide any additional information about the lane discipline of the streets.

Footpath and pedestrian crossing

10. Do you penalize the offenders who failed to stop at stop line?

Yes b. No

11. If yes, how many penalties are applied every day against violation to stop at stop line?

12. How many penalties are applied every day against violation of pedestrian crossing?

13. Do you take any actions against obstruction in footpaths?

Yes b. No

14. If yes, what actions would take against violation of footpath related traffic rules?

Manpower

15. Please mention the training and duration related to traffic management and rules.

16. Please mention the equipments related to traffic management.

PART-C (only for traffic control room)

Traffic control room and technology

17. Please give information about traffic control room function.

18. Please mention the technology used in traffic control room.

Management

19. Please describe the management procedure of traffic control room with field units (Assistant Commissioners of police and their teams consisted of Traffic Inspector, Sergeant and Traffic Constables as well as Ministry of Communication, Dhaka City Corporation (DCC), Bangladesh Road Transport Authority (BRTA) and other concerned authorities).
