

SERVICE LEVEL OF PUBLIC BUS IN DHAKA CITY, BANGLADESH

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ABSTRACT

Dhaka is one of the least motorized cities of the world. Being the very less car ownership rate, most of the dwellers of the city are dependent on the public transport mode for their travel. However, the city has a very limited number of buses plying as public transport in the different routes of the city, which is not sufficient for fulfilling the existing travel demand. Consequently, they are mostly over-crowded, which is not accessible for the elderly or disabled and the women. Moreover, the frequency of bus service (headway) is not good. The research aims to explore the level of service of the public bus operating within the city. For this purpose, 5 different bus routes of the city have been selected and a total of 150 passengers (30 from each route) have been selected and interviewed with a pre-determined structured questionnaire to know their experience or satisfaction level and opinion about the existing bus service and their expectations about public bus service. Surprisingly, it was found that most of the respondents are satisfied with the travel cost of bus but very unsatisfied for long waiting time, sometimes have to wait about an hour.

1. BACKGROUND

The urban hierarchy of Bangladesh is strongly dominated by Dhaka, which is the largest and also the commercial, administrative, and cultural capital of the country. Dhaka is one of the least motorized mega-cities in the world. Current population of the city is over 12 million with annual growth rate of nearly 8 percent (GoB, 2000). The rapid growth of population and expansion of the city along with increased and versatile urban land use patterns has generated considerable travel demand. However, the city is unable to cope with the increasing demand of transport and widening the gap between supply and demand for urban transport services (STP, 2005). This leads to numerous transport problems most notably, reduced access to transport, deterioration in public transport service and comfort, poor road safety, operational inefficiency of transport and degraded urban environment. Even with a very small percentage of motorized vehicles the city dwellers are experiencing severe congestion problem.

The transportation system of Dhaka city is predominantly road based. Although there is a limited use of waterways, the rail and water transport within the metropolitan area is almost absent. The city has no mass transit system like metro rail or bus rapid transit (BRT) systems. However, the government is planning to have BRT systems in three major corridors. As in other Asian cities, the majority of trips in Dhaka are on public transport and non motorized mode (NMT) because a significant numbers of people are poor who can not afford personal vehicle, and most of them are heavily dependent on public transport (Hossain, 2006). Bus service is playing the dominant role in providing public transport facilities in Dhaka. Modal share of trips on

public transport is about 44% (STP, 2005). If only mechanized transports are considered then busses run the highest passenger-km per day. Although bus provides highest passenger-km travel, the modal share of bus in terms of person-trips is comparatively low. So there is a considerable scope of improvement of modal share of bus by improving bus service in Dhaka city (Hoque and Alam, 2001). However, the number of passengers in public transport has been increasing continuously during the last 20 years (Karim and Mannan, 2008).

According to the strategic transport plan (STP, 2005), it is estimated that there are around 7,100 buses to operate in Dhaka. However, only 1,300 of the existing buses are playing of which less than 200 are of improved quality. The bus fleets are mainly standard buses and minibuses. Government owned Bangladesh Road Transport Corporation (BRTC) provides bus services in few routes. However, the private sector is dominating the public transport sector which constitutes more than 95% of the total and often act like a syndicate to provide a monopolistic service. Due to lack of proper planning, management, and maintenance, the bus service is in unsatisfactory condition (Olsson and Thynell, 2004).

Available bus services in Dhaka city could be categorized in two groups: *counter* bus service and *local* bus service. Counter bus service has specified stoppages and tickets are sold at the counters of those stoppages. So, passengers have to purchase their tickets from the bus counters just before boarding such bus. A very small number of counter buses are air-conditioned. In contrast, local bus service has no specified stoppage (stop anywhere on the way for boarding and alighting passengers) and passengers pay the fair to the bus conductor after boarding the bus. There are few buses termed as *seating* service which pick passengers only from specified stops but passengers pay on bus for the tickets.

Dhaka, being a city with very less car ownership rate and poor economy, needs cost-effective public transport systems and services. Thus, bus service should be the spine of transportation for the city. However, various research (Karim and Mannan, 2008; Hoque and Hossain, 2008; Haque, 2000) claimed that the present bus services are inefficient, unproductive, and unsafe due to long waiting time, delay on plying, long boarding time, overloading, discomfort, long walking distance from the residence/work place to bus stoppages, and so on. The paper explored the opinion of the bus passengers about the service level of bus operating in few selected routes of Dhaka City.

2. EXISTING BUS ROUTE OF DHAKA CITY

Bus routes for operating buses or providing transport services in Dhaka City is identified and determined by the Dhaka Metropolitan Regional Transport Committee (DMRTC). The committee encompasses the members from the transport companies and facilitated by the Bangladesh Road Transport Authority (BRTA). The bus route is identified by the private transport company that they want to operate and they apply to DMRTC for approval. No scientific methods or planning process are applied for identifying the bus route and stoppages. The DMRTC committee simply follow either allow or deny to operating on that route. As of April 2009, there were 39 different routes of bus service in Dhaka approved by DMTRC. However, 29 of the routes have

services. The outcome may be helpful for the service provider to know what the passengers mostly expect and thus improve the bus service delivery.

Due to time and resource constraints, it is quite impossible to cover the whole city or all the bus routes of the city. So, only 5 major bus routes namely *Uttara-Azimpur* route, *Mirpur-Motijheel* route, *Jatrabari-Mirpur* route, *Gulshan-Motijheel* route, and *Satmasjeed Road (Mohammadpur to City College)* had been chosen for the study. While selecting the bus routes it was considered that they cover the whole city (both the down town and periphery, planned and unplanned area, and higher-income and lower-income area). All the major bus service providers of the selected route were considered for the study. While selecting the bus provider, both the *counter service*, and *local service* was considered to have the complete picture.

Table 1: Selected bus route and the operators for interviewing passengers

Bus Routes	Bus Stops	Selected Bus Operators	Category of Service
Uttara-Azimpur	Airport, Mohakhali, Asad Gate, Dhanmondi 32, Kalabagan, Sciencelab, Newmarket	BEVCO Paribahan Duldul Paribahan Bus No. 27	Aircondition Counter Local
Mirpur-Motijheel	Mirpur 10, Mirpur 12, Farmgate, Motijheel	Myline Paribahan Shatabdi Paribahan Bus No. 9	Counter Counter Local
Jatrabari-Mirpur	Jatrabari, Gulisthan, Farmgate, Mirpur 10, Mirpur 12	Bus No. 14	Ticket
Gulshan-Motijheel	Mouchak, Malibagh, Doinik Banglar Moor, Purana Polton (Madhumoti)	Modhumoti Paribahan Bus No. 6 (A/B/C/D) Local bus	Counter Ticket Local
Satmoshjid Road (Mohammadpur to City College)	Mohammadpur, Shankar, Dhanmondi 19, Dhanmondi 15, Zigatola, City College	Mega City Paribahan Midway Paribahan Shatabdi Paribahan Raja City Paribahan Maitry Paribahan Bus No 13	Counter Counter Counter Counter Counter Local

After the selection of the bus routes and the operators, discussion with the bus operators (employee at the counters and bus conductors or drivers of that operator) was done to know their frequency of service and other issues of service. A total of 150 passengers (30 from each route) was randomly selected and interviewed with a pre-determined structured questionnaire at different bus stoppages to explore their experience of bus journey, satisfaction level and expectation about bus service. While selecting the respondents for a particular bus route, it was considered that passengers of all the different bus operators of that route are selected equally and sample was drawn from different stoppages of that route. The study was conducted in a normal sunny week days during October 2009 and the survey time was between 08:00 and 18:00 hour of the day. Sometimes the interviewer also traveled on bus along with the respondents to complete the interview.

4. EXISTING SITUATION OF THE BUS SERVICE

4.1. BUS SERVICE LEVEL

Service level is an overall measure of all service characteristics that affect the users. The level of service qualitatively measures the effect of factors such as travel time, speed, cost, which in combination with other factors, determine the type of service that any given facility provides to the user under the stated conditions (Wright, 1996). There are the three major groups of factors (Currie, 2003):

- performance elements affecting users (i.e. operating speed, reliability, safety);
- service quality (i.e. convenience and simplicity of use, aesthetics, cleanliness, behavior); and
- price or the fare rate that the user pay for the service.

The stops or stations are very important for public transport service. Provisions of amenities for shelter, comfort, and safety are needed at stops where passengers have to wait (Currie, 2003). Beside the physical demands, scheduling, roistering, running and supervisions of vehicles, fare collection, and maintenance are the key to service of public transport. Vuchie (1981) identified the important elements of performance are: service frequency, operating speed, reliability, safety, line capacity (the maximum number of seats/spaces or persons can carry past point along the line during an hour), productive capacity, productivity, and utilization. There are a range of issues affecting public transport operations; of which reliability, passenger comfort and safety is important. Of course, the factors may vary in different socio-economic condition with having different public transport systems. Trent Buses, bus operator in Midlands of UK, identified customers' top requirements are: reliability/frequency of services, friendliness of services, clean bus interiors, comfort, value for money, clean bus exteriors, easy access, reasonable fares and easy to understand, and easy to remember the timetables (Disney, 1998). Tyrinopoulos and Antoniou (2008) found that transfer quality and quality service are the top priority in bus services for the customers in Athens. According to them, the key satisfaction indicators were the service frequency, transfer distance, ticketing system, and vehicle cleanliness.

However, above information about bus service are based on developed city, which may not fit for Dhaka City where no timetable is followed by the bus operators and both the interior and exterior of bus is often dirty. "There is, in fact, no comprehensive study on customer satisfaction with bus (or transportation) services in Bangladesh" (Andaleeb, et al. 2007: 2). Nevertheless, based on other studies in European cities, Andaleeb et al. (2007) assumed some indicator for public bus transport service in Dhaka would be as in Table 2:

Table 2: Indicators of Public Transport Service

Comfort	Seats are comfortable, ceilings are at a comfortable height, facilities inside bus in good condition, enough foot space, buses are well maintained.
Quality of the ride	Drivers do not frequently brake hard or blow the horn too much and not drive too fast, buses do not overtake other vehicles dangerously, buses do not often breakdown.
Co-passengers' behavior	Passengers are disciplined, passengers are well behaved, passengers maintain cleanliness.

Insecurity	Afraid of being robbed/mugged at the bus stand, afraid of being pick-pocketed on the bus.
Behavior of Bus Operator/Conductor	Staff behaves properly with the passengers.
Adequacy	Sufficient numbers of buses in the route, seats are generally available on the bus, there are sufficient seats in the buses.
Bus stand facilities	Shelter against rain or sun at the bus stands, enough seating arrangement and enough lighting at the bus stands.
Change buses	No need to change buses many times to reach destination.
Government supervision	Government supervision in checking bus fare, buses are randomly checked to ensure mechanical fitness and safety.

4.2. FACTORS FOR ASSESSING BUS SERVICE IN DHAKA

Study of Andaleeb, et al. (2007) demonstrate that the factors of comfort, need to change buses, behavior of the staff, and government supervisions are significant but quality of the ride, co-passengers' behavior, and feelings of insecurity are not significant in predicting passenger satisfaction about bus service in Dhaka city. Nevertheless, fare, frequency of service, waiting time, travel time, etc of the bus service may also could be the major attributes for assessing the bus service. Thus, Table 3 shows some of the factors or attributes to be applied for identifying existing bus service level of Dhaka City.

Five different levels of services such as: very poor, poor, moderate, good, and excellent have been applied while discussing with the operators of bus service in Uttara-Azimpur route on various service criteria (in Table 3).

Table 3: Bus Service Level of Different Criteria in Uttara-Azimpur route, Dhaka

Service Criteria	Service Level		
	Local Bus	Counter Bus	Air-condition Bus
Fare is reasonable	Moderate	Moderate	Good
Comfortable seat on the bus	Moderate	Moderate	Good
Comfortable movement on bus	Poor	Moderate	Moderate
Air circulation inside bus	Moderate	Moderate	Moderate
Time maintain	Poor	Moderate	Moderate
Stoppage delay	Moderate	Moderate	Moderate
Bus available	Moderate	Moderate	Moderate
Waiting facility	Moderate	Poor	Poor
Ticketing system	Poor	Good	Good
Information available	Poor	Poor	Moderate

Source: Discussion with the bus operators of Uttara-Azimpur route, October 2009.

4.3 MAJOR FINDINGS

Among the 150 respondents of bus passengers from 5 different bus-routes in Dhaka City, about 88% of the passengers reported that they travel regularly in the specified route whilst the remaining are not regular traveler. This indicates that the study does represent the opinion of people who use bus regularly as their mode of travel. The respondents were asked why they use bus as their travel mode. About 76% of them mentioned bus is 'cheaper than any other mode' while the others mentioned

'cheaper and available' or 'cheaper and suitable' or 'cheaper and safe' or 'cheaper and fast' each reported by 6%. All the passengers translate bus service as the cheaper and affordable for them. Not surprising as the bus is the cheapest mode of travel available in Dhaka city (Rahman, 2009). However, due to over-crowding and congestion the bus passengers' understanding is that the existing bus systems are not capable to meet the travel need or demand of the passengers. Moreover, all the passengers believe that carrying extra passengers on bus does create many problems.

4.3.1. Seat Capacity and Extra Passenger

Seat capacity of the buses varies largely. The counter bus services are often with 52 to 58 seats whilst 36 seats in local bus. However, there are few counter buses also with 36 to 45 seats. Whatever is the seat capacity, almost all the buses are carrying more passengers standing. Often the bus is so crowded that it becomes impossible for the women or children or senior people to travel by bus. Consequently, these groups of vulnerable people do not have access to bus service during rush hours (Karim and Mannan, 2008). The bus operators claim that the local buses always carry extra passengers and a few of the counter bus operators do not carry any extra or standing passenger. However, there is no justification of such claim as about 84% of the respondents mentioned that most of the time they do not get a seat when traveling by bus.

4.3.2. Bus Condition

The condition of the bus plying in Dhaka city is not good. This is because the majority of bus fleet is very old and maintenance is very poor or almost absent. Nevertheless, perception of about 47% passengers' is moderate while 26% and 26% are respectively satisfactory and worse about the condition of bus. Despite the poor bus condition they are not feeling it because their main concern might be getting a seat or room inside the bus than its overall condition. As a passenger told 'interior of the counter buses are moderate, however, the local bus is very poor'. Here the interior environment included the size of seat, availability of seat cover, free from odor, availability of light and air, and minimal cleanliness. Surprisingly, 38% of the respondents mentioned 'good' while 24% said 'moderate' about the interior of bus. However, bad and very bad had been reported by 16% and 22% respectively.

4.3.3. Comfort

About 70% of the bus passengers do not feel comfort while traveling by bus. According to them, the major factors that attribute to comfort level are unavailability of a seat and overcrowding of passengers while the minor factors are leakage of rain water, interior of the bus, behavior of the bus staff. For example, one third of the passengers argued that *counter* bus facilities are comfortable because of good seating facilities. About 32% of the respondents mentioned that the seats of bus are uncomfortable. However, if considered only the *local* bus, almost all the passengers reported uncomfortable seats.

About the air circulation inside the bus, very bad has been mentioned by about half of the respondents, however, it becomes 84% solely for the local buses.

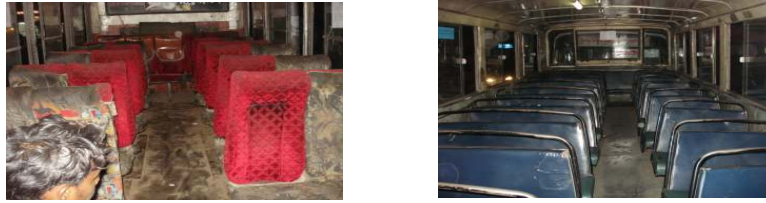


Photo 1: Poor seat condition of the bus.

4.3.4. Bus Frequency or Waiting Time

Waiting time for a bus at stoppage is less than 20 minutes is for 72% of the respondents. However, 12% of the respondents have to wait for more than 40 minutes to an hour and 16% have to wait about 30 minutes for a bus. This indicates a large waiting time for about one third of the people. This high waiting time could be due to low frequency of bus or the passenger is unable to catch the bus because there is no room and hence have to wait for the next one. Considering the bus frequency, only 15% are satisfied about the availability of bus whilst moderate and un-satisfactory are respectively 50% and 35%. However, if considered only the local buses then almost 68% of the respondents are un-satisfied with its availability.



Photo 2: A long que of the passengers waiting for bus.

4.3.5. Delay Time on the Way

About 80% of the passengers reported that beside the waiting time in bus stoppage they are suffering for the delay time in each and every stoppage on the way. The drivers often wait in stoppages for a certain time with expectation that they will get some more passengers. This is common practice for the local bus service. Even, they often load and unload at unspecified stops. These unexpected halt cause unnecessary delay for the on-board passengers. Beside this, higher alighting and boarding time might be another cause of delay. About 60% of the passengers reported that they suffer around 5 minutes of such delay time.



Photo 3: Boarding and alighting the passengers of *local* bus on road, no specified stoppage or passenger waiting facilities.

4.3.6. Movement inside Bus

There is very limited space for comfortable movement inside the bus. About half of the passengers are very unsatisfied whilst only a quarter mentioned moderate about the space for comfortable movement inside the bus. Nevertheless, passengers in local bus cannot move because of jam packet situation. Many minibuses do not provide adequate legroom or even adequate ceiling height for standing. Passenger discomfort increases during rush-hour traffic when riders have to travel standing all the way in extremely crowded conditions. Even, it is common that few passengers are standing in the door and some of them are not even able to stand and hanging outside the door. Only 26% of the passengers are satisfied about movement in the bus; and certainly none of them are of local bus passengers.



(a)



(b)

Photo 4: Passengers are standing (hanging) in the door of an overcrowded bus where other people waiting for the bus (waiting people also tried to boarding but could not manage any room). (a) *local bus* (b) *counter bus*.

4.3.7. Harassment of the Passengers

About 62 percent of the bus passengers reported that they had faced various problems or harassments while bus travel. Sexual harassment to women in a crowded bus is a common problem (Rahman, 2010). Among the major problems, problems associated with boarding or alighting are 56%, associated at the ticket counter are 22%, associate to the trip destination are 4%, and associated with staffs' behavior are 18%.



Photo 5: Bus conductor at the door is harassing a female while boarding.

4.3.8. Staff Behavior

About the behavior of the staff (the conductor or supervisor of the bus), about 30% of the respondents mentioned satisfactory whilst 40% mentioned moderate and the remaining 30% mentioned poor. However, if considered only the local bus, about 83% are not satisfied. This indicates the behavior of a staff in counter bus is much

better than the local bus. This might be because often there is dispute between the conductor and passengers to set a fare rate in the local bus.

4.3.9. Ticketing or Fare

BRTA decide the rate of bus fare and it is on the basis of per km. However, almost all the bus services in Dhaka are imposing more than the prescribed rate. Last year there was several newspapers reporting about this and the government tried to enforce the prescribed rate. However, even though the bus operators are charging more from the passengers, they often claim that they do abide the government prescribed rates. Nevertheless, about 56% of the respondents are satisfied with the current ticket price whilst the remaining believes that they are paying more than that of government specified fare rate. In line with this, about 40% believe the bus fare is irrationally higher compared with the services and mentioned that the government should reduce the fare rate. Certainly, they are the people of lower-income group.

Whatever, about 72% of the respondents argued that the ticketing system is better than the local bus service.

4.3.10. Station location

Among the respondents almost 46% mentioned that their closest bus stoppage is within 0.5 km whilst 36% mentioned 0.5 to 1 km and 24% mentioned more than 1 km to catch the bus. The respondents reported that continuous stopping increase the travel time and decrease the service level. Hence, the majority of the passengers of local bus argued that the distance between two stoppages should be more. Surprisingly, few passengers of the counter bus mentioned that the distance between two stoppages should be reduced.

4.3.11. Station Facilities

Many bus stands do not offer protection from the sun, rain, dust, and other elements that have significant implications for health or safety. Passenger shades are almost absent in Dhaka city. There are a few, however, occupied with vendors or shops and no use for the bus passengers. In some stoppages of the counter bus there are big umbrellas for the ticket master and passengers. However, this umbrella is not able to give any protection to the passenger from heat of sun or rain. There are no seating facilities for the passengers. Often the passengers sit on sidewalks blocking the paths of pedestrians or stand in a que while waiting for the bus. Sometimes the bus stands are situated near dumps, creating an unhealthy and suffocating situation for passengers.



(a)



(b)



(c)

Photo 6: Road side ticket counter where *counter* bus stops for boarding and alighting.
(a, b) Passengers are purchasing ticket/waiting for bus.

4.3.12. Sudden Breakdown of Bus

Due to poor maintenance of the bus fleets, often these breakdown and cause problems to the passengers. About 40% of the respondents reported that they faced unexpected breakdown of bus, mostly due to fitness problem of bus or staff related problem.

4.3.13. Information about Bus Service

About 55% of the respondents get the necessary information what they required however the rest do not get information from the form the ticket counter or conductor. Those who mentioned that they do not get necessary information about the bus service, most of them are the passengers of local bus service.

4.3.14. Requirements of the Bus Passengers

Considering the overall satisfaction about the bus service, almost 68% of the respondents are not satisfied and the remaining 32% are satisfied about the existing service.

The respondents have been asked what they want to have a better bus service. Despite having various issues of poor state of bus service, they only mentioned to have a more frequent bus service so that they can get a seat. Their perceptions about better service are centered on improved bus quality and the seat condition. So, the respondents had been given four facilities and to rank them. The majority gave their first priority to have more bus available so that the journey takes less travel time and waiting time (Table 4). Second priority was to have a confirmed seat which is also somewhat related with the first one. Interior environment of the bus and the behavior of staff are not crucial for the bus passengers in Dhaka City.

Table 4: Passengers' priority for comfortable bus journey

Priority	Facility	% of passengers
First	Availability of bus and less time (traveling and waiting)	44
Second	Confirmed seat	22
Third	Interior environment	20
Fourth	Staffs behavior	14

4.4 BUS AUTHORITY'S PERCEPTION ABOUT SERVICE LEVEL

All the bus operators claimed that they follow the fare structure specified by the government. However, their claim is not true. Even the majority of passengers also aware that they are paying more than the fair it should be.

The bus operators claim that the counter buses maintain a time schedule but the local buses do not. However, there is no time schedule for public transport currently operating in Dhaka City. The operators' perception is if there is a bus in 20 minutes interval, it is maintaining time-schedule. There is no published time schedule of bus service and passengers do not know any schedule and operators do not maintain any schedule in practice.

All the local buses mentioned that they always carry extra passengers than the seat capacity. They claimed that their fare rate is cheaper compared with the counter bus. During off-peak hours frequency of operation of local bus is reduced. However, irrespective to the demand, service frequency of counter bus is almost same throughout the day.

The bus operators reported that not a single bus have seat-belt for the passengers or even drivers and have no emergency exit door. Only 6 seats in each bus have been reserved for female passengers but nothing such for disabled people or senior citizens.

5. DISCUSSION

Public transport is usually a common carrier which provide scheduled service on fixed routes and available for public (usually paying a set fare). However, public transports operating in Dhaka City at present are not following or maintaining any time schedule.

Buses are the major mode of transport, the choice for the majority of community and are the only means of mobility that can be afforded by the urban poor. Due to heavy traffic congestion and absence of any time schedule, waiting time for bus service in Dhaka City is unpredictable for the passengers. Modern buses are equipped with multimedia entertainment/advertising and passenger comforts such as air conditioning. However, these facilities are in very limited number of buses in Dhaka.

Although BRTC has started with the banner of “*Service is our motto: Comfort is our commitment*”, it can not fulfill any of the objectives. With few exceptions, the bus owners or operators, including government owned BRTC buses, do not pay adequate attention to passenger comfort (Andaleeb, et al. 2007). Internal facilities, such as lights and fans, are frequently out of order or in need of repair. Many of these buses do not have fans and lights at all. Other amenities, such as lighting during night, airflow and ventilation, must be constantly monitored to ensure a desirable passenger experience. Basic passenger requirements, like comfortable seats and open windows for airflow, also do not measure up to standards. The results suggest that if comfort can be increased, passenger satisfaction can also be increased significantly, leading perhaps to greater proclivity to use public buses (Andaleeb, et al. 2007).

Certainly Dhaka City needs better public transportation system and services. Few minor steps such as advanced ticketing system, discipline among the passengers while waiting at bus stoppage or boarding and alighting buses, making all buses as sitting service and reserve few seats for the disabled, etc could bring better results for bus service.

In the long run, some other tasks might be needed to improve bus services of the city. For instance, provision of bus-only lane, increasing the number of bus fleet, maintain a specified time schedule and publicize the information widely to make it available for the passengers, adjust the fare rate rationale to the service level, ensure better air circulation inside the vehicle, reduce the delay time in station, etc.

As staffs behavior is an important issue for service level, most of the time the driver run the bus in the middle of road for boarding or alighting passengers from the bus, the government could train all the staff of bus service how they could behave more friendly with the passengers.

6. CONCLUSIONS

The discussion in previous sections reveals that the existing service quality of bus is very poor in Dhaka City. Certainly public transport systems of the city failed to serve the needs of the mass people, particularly the poor and also failed to maintain an adequate level of service at prices affordable for the poor. The number of high capacity buses and their service level has to increase quickly to cope with today's demand. Hence, transport facilities of the city should be provided keeping in mind the population growth, economic development, and future travel demand of the city.

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