

# **BUS TRANSPORT IN DELHI**

**BY**

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## ABSTRACT

Bus transport is the lifeline of Delhiites as more than two thirds of the population depend on it as a mode of transit. There is a need to identify the baseline scenario and recognize the problems with the existing services and urgently take steps to reform the system. This paper explores the major problems with the bluelines which include improper operation and driving practices due to wrong set of incentives for the owners as well as the crew. The problems with the public provider of the bus service, Delhi Transport Corporation is also identified which is running into accumulated losses of more than 6000 crore. There is a need to reform the system by encouraging optimal usage of modal mix, setting up proper institutions for planning, implementation, monitoring and regulation, giving right incentives to the investors and operators and making the system more demand driven with special attention to passenger satisfaction. The new proposed scheme which the Government of Delhi is trying to implement before the Commonwealth games 2010, the 'Corporatization of private Stage Carriages' is a good scheme with regard to the system of service delivery but demands effective implementation and monitoring by the Special Purpose Vehicle set up for the purpose. Further, several lacunae of this approach are explored in the light of the reform model suggested.

The paper also identifies the need for Rapid Bus Transit System in the present scenario and the efforts taken by the government to introduce it in the city. A critical appraisal of the first BRT of the first BRT corridor reveals that the idea and the objective behind it is noble but there are certain preconditions which need to be fulfilled before expecting the shift towards public transport a possibility. A case study discusses the interconnections between different modes of transit between a few important places in city. The study reveals that there is a need for alternative modes as the bus frequency and availability for most of the destination points is very poor.

In the end, we conclude that the process of reform is no doubt underway but there are several lacunae which need to be taken care of. There is a need to speed up the reform process with more professionalism into the system.

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# 1. INTRODUCTION

Delhi has an extensive road network, where roads make up for 20% of the land, the highest for any city in the world. Over the years, there has been a considerable increase in vehicular traffic on the roads, almost nine fold since past three decades, leading to reduction in average speeds. On the other hand, during non-peak hours, the Motor Vehicle (MV) movement on the signal free road network averages 50-90 km/hr, which has led the fatality rates to shoot up. Rising rates of road accidents is evidence enough of poor comprehensive urban transport management strategies adopted in the city, particularly neglecting the safety needs of pedestrians and cyclists, and promoting use of private individual vehicles. There is little justification to allow cars to occupy 70% of the road space, given that they move less than 10 percent of the people. In contrast, buses may occupy twice the space of a car, but can carry 40 times the amount of passenger load. (Source: TRIPP)

In spite of poor quality services, more than two thirds of the city population depends on public transport mainly buses as mode of transit. Besides providing economies of scale, the highly subsidized bus transit serves the interests of a major section of the population across Delhi, and serves as an extremely critical mode of transport for the working population among the lower and lower middle class. Affordability is a major factor that cannot be ignored, and public transport provides this feature through universal provision of cheap bus transit services.

This argument in favour of bus service is supported not only by economical aspects, there is also the other very prominent factor involved- environment. Pollution and congestion has been constantly on the rise; Pollution Control Board claims that more than fifty per cent of the ninety cities that it monitors have particulate matters that are already critical and can cause increase in incidence of chronic heart and lung disease. In August 2008, the average total suspended particulate (TSP) level in Delhi was 378 micrograms per cubic meter--approximately five times the World Health Organization's (WHO) annual average standard (Source: Central Pollution Control Board). Cars that run on diesel engines pose an additional danger since they require fuel that contains 350 ppm of sulphur that release hazardous toxic emissions which are carcinogenic in nature, thus posing serious danger to our health.<sup>1</sup> In contrast, by the Supreme Court orders 2002 the use of CNG as fuel was made compulsory for all the city buses. This has been very effective in reducing the levels of pollution.

Acknowledging the need for public transport this paper focuses on the state of bus transport services in Delhi and analyses the operational performance of the Delhi Transport Corporation which is the main public provider of bus services. The new proposed scheme of the corporatization of private stage carriages is examined in the light of the reform model suggested and a critical appraisal of the same is presented. Further, the case for Bus Rapid Transit (BRT) is highlighted with a critical review of the first BRT corridor in Delhi from Ambedkar Nagar to Chirag Delhi. With regard to this, the impact of BRTS on different categories of commuters is analyzed.

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<sup>1</sup> Narain S. interview: IBN Live, January 21, 2008  
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In the end, a case study is presented to examine the connectivity to the places of interest to students from one of the reputed colleges of Delhi, Lady Shri Ram College. It compares the different modes of transport to reach each of these 15 places in terms of their significance, viability, cost, and complementarities.

## 2. METHODOLOGY

The methodology adopted for this paper was identification of key issues, data collection, data interpretation to analyse the specific issues and finally suggesting the solutions. We have adopted a realist approach being a part of the stakeholders and kept the observations structured and quantifiable. We have used secondary data to form a strong theoretical framework to understand different dimensions. Primary data has been used to collect the views and opinions of different stakeholders involved.

## 3. PRESENT SITUATION OF BUS TRANSPORT IN DELHI

Urban transport is mainly the responsibility of the State Government. The main agencies involved in managing the transport sector are

- State Transport Authority --- registration of vehicles, routing of public transport services
- P.W.D., M.C.D. --- Construction and maintenance of roads,
- D.T.C. – operating public bus transport system,
- D.D.A. --- Construction of roads in newly planned areas
- N.H.A.I. --- Construction and maintenance of National Highways
- D.M.R.C. is responsible for Metro Rail

Buses have an integral and pre-eminent position in Delhi's transportation system. According to the RITES Primary Survey 2007, 79% of the population uses bus as the means of transport.<sup>2</sup> The bus services in Delhi is a mixture of private stage carriage buses, buses owned and run by Delhi Transport Corporation and metro feeder buses provided by Delhi Metro Rail Corporation. Let us have a look at the stakeholders with regard to bus transport in Delhi:

- The Transport Department of the Government of National Capital Territory of Delhi.
- State Transport Authority
- Delhi Transport Corporation
- Individual blue-line operators
- Delhi Integrated Multi-modal Transit Limited (DIMTS)

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<sup>2</sup> See Appendix 1  
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- Commuters
- Traffic police
- Mini-bus owners (RTV)
- Delhi Metro Rail Corporation
- Staff on the buses (drivers, conductors)

The intra city buses owned and run by individual operators are divided into stage carriage and contract carriage.

**Stage carriage buses:** stage carriage buses are the buses which hold a permit to stop at the stages (bus stops) on the routes they run on.

**Contract carriage buses:** contract carriage buses are the fleet of buses which ply from point to point and are not allowed to stop at stages. Owned and operated by private operators, they ply their buses in contract with specific organizations. They operate as chartered buses, school buses etc.

The number of vehicles on Delhi's road has increased from 19.23lac in 1991 to over 60 lacs by 2008, an increase of 212% in last 18 years. The no of private buses currently plying the routes are 2200<sup>3</sup> and the number of DTC buses are 3658<sup>4</sup> of which 2209 are standard CNG buses, 625 are low floor buses, 25 are A.C. low floor buses and 99 are diesel buses.

## 4. PRIVATE STAGE CARRIAGE SYSTEM

### 4.1 HISTORY

The State Transport Authority is the nodal body responsible for the grant, renewal or suspension of permits, drafting of the routes and the time table for the blue-line buses. Private stage carriages in Delhi have been present from before Independence. The earliest scheme, known as the Old STA Scheme comprised 100 permits. Then, the Graduate Mini Bus Scheme was launched in 1976 to provide self-employment to unemployed graduates. This scheme gave around 75 permits. In 1980, the DTC introduced a Kilometer Scheme (KMS) under which the bus owners provided the drivers, DTC the conductors and the tickets, with the owners being paid on basis of the number of kilometers logged. Another scheme, the Point to Point Scheme, was introduced at the time of the Asian Games 1982. The routes for this service, as its name would also indicate, were the shortest between origination and destination points. An important feature of the Point to Point Scheme was that the permits under it mentioned the two terminal points only and not more than an extremely vague indication of a via point, if at all. After Asiad 1982, more services were introduced under this scheme and the number of permits under it grew to 324. KMS had

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<sup>3</sup> Data from the Deputy Secretary, STA

<sup>4</sup> Data from Manager, Traffic Dept, DTC

to be terminated when DTC could no longer provide conductors and other administrative support for these buses when DTC employees went on a prolonged strike in 1988. KMS then metamorphosed into the arrangement called Earn & Keep Scheme (EKS) where the owners provided both drivers and conductors, retained the fare box collection and had the formal obligation to honour passes issued by DTC. When the strike ended, the EKS owners declined to go back under DTC's KMS fold, leading to the introduction of the Suvridha Scheme, comprising 583 permits, which came in 1992. However, the overwhelming majority of the private stage carriage permits came into being through "*A Scheme for Private Bus Service in Delhi under Stage Carriage Permits*", which was also advertised in the year 1992. Stage carriages introduced under this scheme quickly came to be known as Redline buses owing to the prescribed colour code. Soon after introduction, these buses were involved in a spate of accidents. This led to the colour code of the buses being changed to blue and they came to be known as Blueline buses.

An important feature of all the private stage carriage schemes was their similarity in ownership pattern, which was predominantly one bus per owner. The 1992 scheme restricted the total number of buses per individual to five and per company to ten. This feature, on the one hand, limited the scheme to small investors who could not be expected to hire a professional management team to run the operations and on the other, parceled out each route amongst a multiplicity of different private stage carriage owners. It also allowed prospective permit holders to remain outside the purview of the Motor Transport Workers Act, 1961 which defines the working conditions of drivers employed by owners employing five or more motor transport workers.

#### **4.2 OPERATION**

The operation of bluelines is done by a "theka" system. In this system, the driver or the conductor of the bus is the "Thekedar" or sometimes there is a third person acting like a thekedar and who hires a driver and a conductor for managing the bus. The thekedar pays the permit holder a fixed sum of money per day which ranges from Rs 2500-3500 depending upon the route and could retain any amount beyond that for him to earn maximum profit. If the driver is hired by a thekedar, he is paid on the basis of number of trips made each day at almost Rs100 per trip. This increases incentive for the driver to overspeed and complete maximum number of trips possible in a day. Since the person operating bus on 'Theka' is not liable/answerable to anyone except permit holder, he grossly indulges in the most unruly behavior on the road in utter disregard permit conditions, traffic regulations and provision of Motor Vehicle Act, 1988 and rules. Though, such practices, make the permit liable for cancellation in accordance with the provisions of the Motor Vehicle Act, 1988 and rules framed there under, it is very difficult to establish / detect such a violation for cancellation of the permit as the agreement between the permit holder and thekedar is an un-written, silent/sleeping agreement.

#### **4.3 PROBLEMS**

The problems with the bluelines include rash driving, frequent tampering of speed governors, over speeding, overtaking, unscheduled stoppages and waiting at bus stops to get more passengers, ill maintained buses, rude behavior of crew, dirty buses, presence of bad elements with crew on the bus, over charging, installation and continuous blowing of

pressure horns, beating the sides of the buses and shouting by conductors to attract commuters, non-adherence to the fixed working hours (eight hours), curtailment of routes at the will of crew to avoid rural or low catchments area, overcrowding of buses, non-adherence to statutory employment / labour and motor transport worker's act, employment of unqualified staff, and unsafe operation, etc.

A number of reasons have been given for the aforesaid problems. The government mainly puts the 'profit motive' of the private operators as the main factor behind the growing menace. Since there are a number of individual operators, there is cut throat competition which again is the outcome of profit motive as being the sole objective. The real problem lies with the wrong set of incentives which forces the driver or the conductor to have the residual claim to the revenue and hence encourages overspeeding and overcrowding. Another problem identified is the over subsidized bus fares which doesn't generate enough revenue which would suffice for the thekedar after giving the fixed sum to the permit owner. Low fares and the highly regulated and uniform fare structure destroys all the incentive for a private operators to invest in the maintenance and the upkeep of the bus and instead creates incentives to indulge in malpractices. Moreover, most of the blueline owners are small individual operators who do not have enough finances to put into the maintenance of the buses. As the government initially had given private stage carriage to permits to a certain economically backward groups of people to give them sustainable means of livelihood, not enough importance was given to operational experience and hence the private owners have no system of operation. Another problem is that the permits under the 1992 scheme were given according to a draw of the lot, all the applicants did not get their preferred routes. This led to applications and pleas from the owners for the change/extension of the routes. STA, in the absence of any mechanism for designing routes, gave more importance to the pleas of the owners than to consumer interests. This is the reason why no buses are seen on the unprofitable routes. The excessive regulation by the STA which curbs free entry and exit, and doesn't give the right to set fares destroys all incentives for decent returns. Bribing of DTC drivers or the traffic police to dominate the important routes and remain ahead of the DTC buses is a common case. An official remarks, "*apni security kise pyaari nahi hoti, yeh blueline waale saare mafia log hote hain, driver kya karein.*" On the role of police in this case, he says "*police toh bas samjhauta karana chahti hai, action nahi le sakti.*"

Realizing the problem, the Supreme Court has passed orders from time to time for the cancellation/suspension of permits if these buses are found violating the stated permit conditions. The enforcement officers have also become much stricter after the concern shown by the media and the government in the increasing number of fatal accidents. But in spite, their performance has been highly unsatisfactory. It is widely believed that the existence of individual Private (Blue-line) Stage Carriages is a proven danger and threat to the life and limbs of the commuters and road users of the city. Hence, in this regard government has passed the idea of phasing out of the bluelines. Currently no new permits are being granted to individual operators and bluelines which are running are on a three months permit by the order of the High Court till the time new DTC buses do not come on the roads.

## **5. DELHI TRANSPORT CORPORATION**

### **5.1 HISTORY**

Delhi Transport Corporation is an agency of the transport department of the Government of Delhi and is the main public provider of bus service in the city. It was established on 2 November 1971 by the Government of India under section 3 of the Road Transport Corporations Act, 1950, to provide an efficient and economical public transport service in Delhi. The control of the Corporation was transferred to the Government of Delhi with effect from 5 August 1996 with a fleet strength of 2636 buses and 30,779 employees.

The issued and the paid-up capital of DTC are completely subscribed by the Government of Delhi. DTC has been incurring losses since its inception. The cumulative losses increased from Rs. 1,082.14 crore in 2001-02 to Rs. 4,008.46 crore in 2005-06. There was a sharp increase in the percentage of staff cost to total revenues from 68.42 per cent in 2001-02 to 101.76 per cent in 2005-06. The staff cost exceeded the revenues from 2002-03 onwards.

### **5.2 ORGANIZATION AND MANAGEMENT**

It currently runs a fleet of 3658 buses plying on 657 routes in the city. DTC has manpower of about 27818 employees comprising of drivers, conductors, traffic supervisory, repair and maintenance and administration staff. The overall management of the corporation vests in the Board of Directors (BOD) consisting of eight official directors and ten non-official directors including four directors having expertise in the field of transportation. The Chairman-cum-Managing Director (CMD) is the chief executive of the Corporation who is assisted by the Chief General Manager (Operations), Chief General Manager (Personnel), Chief Accounts Officer and Financial Advisor, Chief Vigilance officer (Vigilance and security), Regional managers and Depot Managers in the day to day working of the Corporation. The Corporation has 34 depots with sufficient parking capacity for buses. These depots are involved in operation and maintenance of buses. The Depot Manager, has subordinate officers in mechanical, traffic and account wings, to assist him in depot functioning. There are 7 regions in DTC, each headed by Regional Manager, who is having 4 - 6 depots under his Administration Control. The most important department is the Traffic Department – “responsible for making policies of traffic matters e.g. Concessional/Free passes, Fares, Tickets, Special Hire, Schedule & Planning of City Routes, Private Bus Operations, Special arrangement for various National/religious functions, permits for City/Interstate operation, Bus stops/Bus Queue Shelters etc”. But according to a senior official in the department, the routes are designed not according to some study or a survey to determine the demand on a particular route but by the experience of the department. The designing of the routes is a dynamic process although it is done on the basis of experiment or trial. During 2001-02 to 2005-06, the CMD was changed six times for the period of four months to two years depriving the Corporation of the benefits of continuity and steady leadership.

### **5.3 OPERATIONAL PERFORMANCE**

The Audit Report of the Comptroller and Auditor General of India for the year 2006 gives the analysis of the operational performance of the Corporation during the five years ending 2005-06. The performance of the Corporation can be looked at with the following parameters:

#### **Fleet strength and age profile**

For ensuring efficient and satisfactory public transport, maintenance of adequate fleet of buses for operation of scheduled routes is necessary. Acquisition of new buses is necessary for augmenting the existing fleet as well as replacing the old and un-serviceable buses. Association of the Road Transport Undertakings (ASTRU) had recommended (1971) that the normal life of a bus should be eight years or five lac km of operation and that a minimum of 60 per cent of fleet strength should consist of buses with less than four years of operation. The fleet strength and age profile of the fleet of the Corporation during 2008-09 shows 3804 buses at the end of the year, when 498 were added and 232 were discarded in the same year. Number of buses more than 8 years were 2103 on 30<sup>th</sup> April, 2009, or 56.24 per cent of the buses were overaged. As against this, only 1.04 per cent buses of the fleet were over age in March 2006. Hence where the average fleet increased only marginally from 2005 to 2009, the percentage of overage buses increased 50 times, increasing the need for discarding this additional percentage.

#### **Fleet Utilization**

Optimum fleet utilization is necessary for assessing the operational performance of a transport undertaking. It represents the ratio of buses available and buses on road. The fleet utilization ranged from 71.69 per cent to 91 per cent during the period 2001-02 to 2005-06 but has been decreasing since then. In 2008-09 it was 77 percent which is the lowest in the last six years.

#### **Vehicle productivity**

Vehicle productivity refers to the distance travelled by each bus per day. The vehicle productivity of the corporation has been declining since 2005-06. The operational ratio (ration of trips operated daily to the trips scheduled daily) and the km efficiency (ratio of operated kms to scheduled kms.) have also deceased during 2005-06 to 2008-09. The government stated (October 2006) that vehicle productivity depends mainly on operational conditions and traffic density. The CNG buses were introduced for the first time in India by DTC and that there are some technology problems. The reply is not tenable as CNG buses were introduced four years back which is sufficient time for technology stabilization as well as understanding the operational intricacies involved. Although increase in the number of overage buses can account a major factor for the decline in these standards, decline in almost all the performance parameters is certainly linked with the change in the top administrative staff after 2005-06.

#### **Load Factor**

The load factor represents the percentage of seating capacity offered to seating capacity actually occupied. The load factor of the Corporation decreased from 99.56 percent during the year 2000-01 to 82.66 per cent in 2001-02 and further decreased to 74.42 per cent in 2005-06. Audit analysis revealed that one of the reasons for the poor load factor was curtailment of scheduled kms due to late out shedding. In 2008-09 it was one of the lowest in the last five years at about 69 per cent. The total passenger carried and the percentage of passengers carried daily decreased from 2005-06 to 2008-09 in spite of an increase in the number of buses on road.

### **Route Operation**

Operational performance can be improved by periodic review of uneconomic routes with a view to assess their continuance, rationalization of routes, and optimum operation of buses on the higher revenue earning routes. In the audit of 2005-06 it was found that none of the routes operated by the Corporation were recovering the total cost of operation. Number of city routes was not even recovering their variable cost resulting in cash losses on their operations. The number of such routes increased from 45 in 2002-03 to 54 routes in 2005-06. Scrutiny of the records relating to the schedule curtailments revealed that the Corporation could not operate 19,49,685 kms during the period 2002-03 to 2005-06 due to non-availability of conductors through the Corporation had surplus conductors during the same period.

### **Non-adherence of preventive maintenance schedule**

Preventive maintenance is essential to keep the buses in good running condition and to reduce breakdown/other mechanical failures. Scrutiny of the records by audit revealed that the required preventive maintenance schedules like servicing, engine oil change and brake inspection was not observed being adhered to. Non observance of preventive maintenance resulted in substantial increase in the number of breakdowns (per 10000 kms) from 0.22 in 2001-02 to 0.67 in 2005-06 and further to 1.36 in 2008-09.

### **Material Consumption**

Control of fuel costs by a road transport undertaking has a direct bearing on its profitability. The Corporation had fixed (August 2003) a norm of 3.20 and 3 kilometres per kilogram for TATA and Leyland buses respectively. Though it took four years to fix CNG norms, the same were fixed without any documented study of the actual consumption of CNG in city conditions or with reference to the manufacturers' specification. Audit scrutiny of the fuel consumption pattern revealed that actual consumption of CNG was more than the norms fixed by the Corporation. The actual fuel efficiency decreased till 2005-06. In 2007-08, statistics show improvement in material consumption in diesel consumption, engine oil consumption, CNG consumption, and CNG oil consumption. The average inventory balance has also improved.

### **Delay in obtaining fitness certificates**

The corporation has to obtain certificates of fitness from the state Transport Authority for its buses under section 62 of the central motor vehicles rules 1989. The certificate is valid upto two years for new buses and for one year thereafter. It was noticed by audit that 190 to 651 buses sent for fitness tests during 2001-02 to 2005-06 failed to obtain fitness

certificates due to reasons like mismatch of engine with that in the registration certificate, non installation of speed governors and poor conditions of buses, which are prima facie controllable by proper management.

### **Automatic Vehicle Tracking System (AVTS)**

The Corporation entered (January 2001) into an agreement with the Computer Maintenance Corporation Limited for implementing an Automatic Vehicle Tracking System (AVTS) based on differential Global Positioning System(GPS) to track and monitor its buses in real time so as to enable better fleet management and improve consumer satisfaction. Against stipulated date of completion by January 2002, the project was completed in September 2004 after a delay of more than two and a half years. According to the findings, the traffic income in case of the depots without AVTS is comparable or in some cases better than the depots with the AVTS. Also in other operational parameters like fleet utilization, kilometre efficiency and traffic income per kilometre, the position of non-AVTS depots was comparable or better. It was evident that the system failed to give the desired impact. AVTS was supposed to submit 48 reports relating to the position of buses, driver behaviour etc. but only 14 reports were generated daily and rest intermittently. There was no regular follow up of the reports and no remedial or corrective action was taken including action against the erring staff. Thus the project was discontinued as the benefits derived by the Corporation were not commensurate with the expenditure. In spite of the project being terminated, there are busses still running with the GPS installed but for no use.

### **High rate of Accidents**

The total number of accidents per lakh kilometres was 0.10 in 2008-09, out of which 16 per cent were due to rash and negligence of DTC. Although the accident rate has decreased in the last five years, there is actually a need to impart regular training to all the drivers before they are permitted to drive the buses and initiate disciplinary action against the erring drivers.

### **Financial Management<sup>5</sup>**

The total income comprising of the traffic and non-traffic income has decreased from 2005-06 to 2007-08. The total expenditure on the other hand has increased. It is important to note that total expenditure shows a decline in the material costs but an increase in the labour costs and huge increase in the interest on Government loans. This has resulted in total loss of 121581.08 (Rs in lac) and accumulated losses of 618625.97 (Rs in lac) in 2007-08.

### **Fare Structure**

Fares set should be such that it covers the operational costs while keeping in view the social obligations and affordability to the travelling public. Section 19(n) of the Road Transport Corporations Act, 1950 read with Section 22 envisages that the corporation may determine the fare structure for carriage of passengers with the prior approval of the government keeping in view the business principles. A commercial organization cannot be

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<sup>5</sup> See Appendix 3  
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expected or be required to run at a loss and it is not established for the purpose of subsidizing the transportation of passengers or goods. The Board of Directors of the Corporation recommended revision of fares in May 2001. A committee was set by the Government of Delhi in 2002 to study the economics of operation post increase in CNG prices. While recommending the revision of fares, it also suggested that revision should be done every three years. In spite, no revision was done. Again in 2005 proposal for revision of fares was put up to the BOD, but no action was taken. Thus fares were not revised despite 80 per cent increase in variable costs. Also there was no revision of special hire charges which deprived the Corporation of additional revenue.

A senior clerk in the Corporation who has been working there since the 70s said, "My monthly pay was Rs 250 when I joined here and now I earn Rs 35000 per months, but the student pass stands the same at Rs 12.50 per month from that time." The statement itself highlights the need to revise the fares to make it commensurate with the rising costs.

### **Internal Audit**

The audit report reveals that the internal audit system is not commensurate with the size and nature of the services of the corporation. Further, no training was imparted to the staff to hone audit skills nor was any supervision of the fieldwork by the supervisory level officers undertaken.

### **Public Relations and administration department**

The Public Relations Officer is not available easily to the public. The department does not provide the annual reports on the website. In fact the Annual Report of the Corporation for the year 2008-09 is "under process" and that for the year 2006-07 has not been "published". On demand for the annual report 2007-08 and 2006-07 from the CGM (Administration), he says "RTI mentions a lot of things, but we cannot give this information to an outsider." What the officer does not realize is that the outsider is the tax payer who is actually paying for the losses incurred by DTC.

### **5.4 Problems to the commuters using DTC services**

- There is not enough number of buses to cater to the demand. As such there is overcrowding on the buses. Though the officers agree with the fact that there is a shortage of buses, but there has been no study to find out the actual demand for the buses in the city.
- Adequate number of DTC buses or DTC buses at all are not found on the most used and profitable routes. There are several reasons for this:
  - a) Not enough number of buses with the DTC.
  - b) The decision of route planning and number of buses on a particular route is done by the traffic department of the DTC. According to an official in the departments these decisions are taken without any documented study or survey of the areas but on the basis of "experience" and "experiment".
  - c) The pressure from the powerful blue-line operators forces the drivers and even the route planners to withdraw DTC buses from profitable routes.
- The level of comfort in the buses is low. There are only 50 air conditioned buses plying currently.

- There are frequent reports of accidents of the buses making safety in these buses a matter of concern. Even the low floor buses have shown an accident rate of 0.15 per lac kms in 2008-09.
- The bus stops have no passenger information systems for providing information of bus routes to the passengers.
- The buses do not follow the time table. A commuter usually has to wait for much longer to get a DTC bus as against a blue-line. On some of the routes the bus frequency is as low as 1 in 44 minutes.

### **5.5 Suggestions for the Corporation**

- The Corporation needs to take steps to increase its fleet. The orders should be placed well in advance and a regular follow up is required by the Corporation for the completion of the orders in time.
- There should be proper documented studies to assess the needs for addition and deletion of routes and to assess the demand on a particular route.
- The Corporation needs to take steps to improve fleet utilization, vehicle productivity and operational ratio to earn more revenue.
- Systems for monitoring consumption and preventing leakages and possible pilferages of fuel, lubricants and coolants need to be strengthened.
- Targets need to be fixed and monitored for various job works in the central workshop.
- GPS should be introduced but with a social cost benefit analysis done well in advance along with measures for proper monitoring of the system and disciplinary action for non submission of the reports.
- The bus stops should have passenger information systems to provide information about the bus routes and the timings like the metros.
- Statistics show expenditures far exceeding the income. The total earning per km is decreasing while labour costs and interest burden is increasing. Hence there is a need for prudent financial management.
- The Corporation needs to furnish all the information stated under article 4 of the Right to Information Act on the website and otherwise to any person without any demand for a reason. Action should be taken by the Vigilance department or the Government for non- adherence by the staff. Annual reports should be published on time.
- Fare revision is a must in order to improve the financial structure of the Corporation. According to the Commissioner Transport, "According to a survey 70 per cent of the people are ready to pay higher price for a good bus transport service". Therefore the people understand that a quality service comes with a price and they are ready to pay a price. Moreover, more number of passes can be given to the target groups like BPL households to subsidize the fare.
- As clear from the statistics, most number of accidents from the DTC have been due to rash and negligence by the drivers. Therefore, sufficient and regular training should be provided to the drivers and immediate action should be taken against the erring ones. They should be appointed seeing their driving experience and also the infractions.
- Automated ticketing Machine should be there in all the buses.

## 6. REQUIREMENTS OF EFFICIENT BUS SERVICE

Identifying the problems with the present system of operation of the private carriage as well as the DTC buses, there is a need for reform in the system itself. Seeing from a consumer point of view, a quality public transport service can be judged with the following parameters:

- **Safety:** considering the increasing number of accidents by the buses, safety is the most important need for a good bus service. Analyzing the reason for the accidents, it is found that rash and negligence on the part of the drivers is the main reason for the accidents. Mechanical failures constitute a very small proportion. Therefore the need to address is paramount and any new scheme needs specific provisions in this area.
- **Reliability:** the bus service provided should be reliable in the sense that it should follow schedule and the time table. Reducing the number of breakdowns on the roads and increasing operational ratio is required. This would also include removal of undesirable driving practices like over speeding, missing stops, illegal practices. A lot of these problems presently can be attributed to on-road competition by the individual bus owners. The revenue system is such that drivers have a strong incentive to pick up passengers wherever they can. Installation vehicle location system in the buses which provides timely report of the position of the bus and effective monitoring of the same is required.
- **Availability:** the buses should be available at a reasonable frequency and on all the routes. This would again happen if the time table for the buses is carefully prepared. Moreover, in the present system there are hardly private buses on the unremunerative routes as they are economically unviable and there are not enough DTC buses to ply on all the routes. Adding to this, the routes are designed in an unscientific way which leads to omission.
- **Speed:** the speed of the buses should be fixed at a limit which is safe and also ensures that the stipulated distance is reached in the time fixed. Ensuring that the buses have speed governors and which are not tampered is a must.
- **Affordable:** the bus fares should be such that they are affordable by a common man as public transport is for the masses. The current level of fares is extremely subsidized which is not able to cover the costs of operation of the buses. The fares have never been revised and there is a uniform fare after 12kms.
- **Comfort:** there are a number of factors that account for the comfort level in a bus. The seating space, air conditioning, cleanliness are factors which need to be taken care of in the bus. There can be a choice in the quality of services offered and accordingly in the fares. For example, as there are A.C. low floor buses and non A.C. buses.

- **Commuter friendly:** the behaviour of the conductors in the bus should be friendly and courteous as against the present situation where the conductors are mostly rude and impolite. The conductor should ensure that the reserved seats for women, disabled or old are occupied by others. The buses should also have passenger information systems to provide the information of the next stop. The infrastructure of the buses should also be disabled- friendly such as that of the low floor buses

## 7. THE REFORM MODEL

To provide a service complying with the above standards, the reform model should include the following:

- There is a need to optimize modal mix and to integrate all modes to avoid duplication, to enable all modes to perform optimally and for better utilization of assets.
- There is a need to optimize road space by banning parking of vehicles on road, earmarking lanes for public transport or permitting access in congested areas only by public transport. This will lead to improved accessibility to public transport, improved speeds and reduction in the number of accidents. The separate bus lanes will reduce the problems of congestion and weaving in and out of other small vehicles from the way.
- There is a need to increase the buses with higher service level to increase the coverage of public transport and avoid overloading of buses, thereby increasing comfort levels.
- There is a need to consider proposals for fare revision or alternative fare structures for maximization of revenue and profit. This needs to be coupled with benefits to certain social groups.
- There is a need to empower the public transport user by institutionalizing consultation mechanisms with citizens and install effective procedures to address grievances. Consumer feedback would lead to improvement in quality of service.
- The enforcement agencies should take strict enforcement measures to provide a level playing field for all the service providers.
- There must be increased usage of information technology as manual checking is bound to be inefficient. This will reduce the operating cost; enable planning of routes and exercise better control.
- It is necessary that the government facilitate the establishment of driver training schools (which are presently not available for drivers of private carriages) and arrangements for their certification, registration and ongoing training.
- Operator's revenue must be progressively decoupled from the number of passengers carried in order to avoid the negative effects that result from competition from passengers on the streets. There should be an emphasis on non-

traffic revenue like advertising revenue which can be an additional source of revenue at virtually no extra cost.

- There should be sufficient incentives for bus maintenance and adequate penalties and fines for non-compliance of requisite standards, route schedules, timetables etc.
- Financial support should be given for plying the buses on economically unviable but socially desirable routes.
- The bus infrastructure plan should include improved bus stops, pedestrian crossings, kerbs, shelters to protect passengers. Providing parking and basic amenities at terminals for both vehicles and passengers.
- The bus service reform is not possible without a rationalization of the existing routes keeping passenger demand and satisfaction in mind. A coherent network, rather than uncoordinated routes, is user friendly and will increase use of bus services. Irrational route networks are uneconomic for operators and at the same time result in user dissatisfaction.
- There should also be a provision for training of owners and senior management in modern business and management practices. Assistance, training and know-how transfer for computerization and data management can be provided.
- There must be basic efficiency indicators to judge the performance of an operator.
- Institutional arrangements should be clearly defined and there should be no overlapping of responsibilities. The operation and regulatory bodies should be separated. There should be separate agency to prepare well coordinated plans. A Special Purpose Vehicle could be set up to oversee planning and operation of bus services. This could be done by registering it as a Government Company which represents all the stakeholders. The function of the SPV would be to assess the transport scenario in the city, to plan the transport system and to contract services to private operators.
- The reform model should include the improvement of the existing institutional framework along with introducing the new as the former is generally more difficult a task. There is a need to strengthen the existing State Transport Authority.
- A detailed cost benefit analysis should be done to determine whether the improvement plans are viable or not. The analysis should include the Financial Internal Rate of Return (FIRR), the Economic Internal Rate of Return (EIRR) and Net Present Value (NPV).

## **8. THE NEW PROPOSED MODEL**

### **8.1 CORPORATIZATION OF PRIVATE STAGE CARRIAGES**

The new scheme which is drafted to address the lacunae of the present system of bus transport is called 'corporatization of private stage carriage' or the 'cluster approach'. The various stakeholders in this scheme are the service providers which are independent private companies, the transport department of the Government of national capital

territory of Delhi, and Delhi integrated multi-modal transit limited (DIMTS) which is an independent agency acting as an Integrated Mechanism (IM), which has the responsibility to handle the bid management process, monitoring and management of the operation of private stage carriage buses, preparation of unified time table (UTT), monitoring of service level standards and other key aspects. DIMTS has been set up as a Special Purpose Vehicle as a joint venture of GNCTD and the Infrastructure Development Finance Company (IDFC). As per the new scheme, DIMTS has aggregated all the existing 657 bus routes in 17 clusters. DIMTS will select a private entity for each cluster, through a competitive bidding process. Selected players will provide private carriage services under a suitable contractual structure. These private players will be a company and not an individual or a cooperative. These contractual structures will be designed to ensure universality, uniformity and compliance to prescribed performance standards. Each cluster will be a mixture of viable and unviable routes and will have 200-250 private buses. These buses will be in competition with the DTC buses running on all the routes.

The interesting part of this model is the revenue system for the private company. Known as the Gross Cost Model, in this system, all ticket revenue is returned to the government and paid to the operator on the basis of pre-defined costs that they set out in their original tender to run each contracted bus kilometre. This revenue is said to come from fare-box collections or on-board revenue. The operator also gets a share of the off-board revenue which is decided by the DIMTS. This off board revenue would come from sale of tickets issued by the DIMTS, special passes, and advertisements on the buses. All buses will run under the branding of 'Delhi Transit' and there will be an Integrated Ticketing system which are valid along the entire Delhi transit network.

The private operators will also have to meet specific performance standards relating to (a) safety, (b) punctuality, (c) other customer service parameters, (d) vehicle condition (e) operational practices, etc. The performance parameters will be measured with the help of objective data generated by ITS, such as Geographical Positioning System (GPS) devices, incident reports, and monitors both on board the bus and at bus stops. A critical feature is the use of registered and certified drivers, with biometric identification, whose presence on the vehicle will be monitored. These buses are allowed to use public infrastructure like the roads, bus depots, terminals. In addition to the basic services, the private companies also have an option to provide premium services and charge extra fares for those (which is specified by the government) and keep the on-board revenue.

## **8.2 APPRAISAL**

The scheme which has introduced corporates instead of private individuals has a lot of benefits as witnessed in the public transport models in Bogota and England. The most important is the decrease in the on road competition and decoupling of revenue from the number of passengers carried. The scheme in this regard is somewhat similar to the erstwhile km scheme. Moreover it is easier to monitor one company instead of hundreds of small operators on the road. The scheme also specifies a number of performance parameters and has enabled IT equipments to track the buses through GPS, devices to

issue tickets and that record the number of tickets issued and the time and the place of issue, devices to communicate a number of operational parameters on a continuous basis to the control centre and devices to record the identity of the staff in the bus like the driver and the conductor. The driver will be engaged from a pool of certified and trained drivers with biometric records in a central database. Each driver's information will contain biometric information and information about his or her previous violations and training history.

To increase the efficiency, both the private service and the DTC will be penalized for failure to run a scheduled service. Violations of each of performance parameters will attract a financial penalty on the company commensurate with the gravity of the breach. The penalty will be deducted from payments due to the concessionaire. Repeated offences may result in termination of the concession contract. In addition, each concessionaire will be paid relative performance bonuses based on good performance relative to other concessionaires. This will also help institute practices of continuous improvement. Hence the system of incentives and disincentives enables the delivery of better quality services. Each important bus stop will be progressively provided with equipment that will permit communication with the control centre and display real time information with regard to operation of relevant buses. This will address the waiting anxiety of passengers and improve safety by reducing the incentive to stand on the road to look out for buses as well as reduce overcrowding. Stops may also be equipped with vendors/facilities to sell tickets and passes. Bus operators will be provided depots for parking and maintenance of their buses thus facilitating better vehicle fitness and standards. Comparing the present system with the cluster model with respect to the parameters for consumer satisfaction, the latter model is definitely an improvement.<sup>6</sup>

### **8.3 CRITICISMS**

The designing on the clusters is done according to the already "well established network of routes." (Report on methodology for operations of private owned stage carriage buses, 30<sup>th</sup> October 2008). However there has been no scientific study done for the rationalization of the routes. The fares are once again to be decided by the STA. However, the Delhi Master Plan for transport policy aims at the creation of an Integrated Metropolitan Transport Authority which will look after regulatory issues like fares and tariffs and as well as provisioning of common services to metro, rail and bus systems. Hence there is a need for the formation of a separate regulatory body for the revision of fares from time to time. Moreover since there has been a delay in the finalization of the bids, the completion of the project in the stated time frame is questionable. In addition there has been a delay in the purchase of new low floor buses by the DTC. When questioned, the Commissioner cum Managing Director and Secretary Transport Department, R K Verma says "we have just two manufacturers for our buses who do not have enough capacity for the production of low floor buses. They have set up new plants which is why the production is delayed. Also there has been a change in the specifications of the buses from time to time which has led to the delay in production according to the desired specification." In the same context, the procurement of low floor buses for all the

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<sup>6</sup> See Appendix 2  
*Centre for Civil Society*

clusters in the near future is again questionable. The important point to note is that there is also an urgent need to replace the existing fleet of DTC as in 2008-09 more than 56 per cent of the buses were over age. In the institutional set up, there is no clear delegation of responsibilities to the different bodies. DIMTS and RITES often have overlapping responsibilities in terms of their consultation services. Similarly the route scheduling by different bodies for DTC and private buses again poses a question of integration of different services.

#### 8.4 SUGGESTIONS

- Proper implementation and monitoring of the scheme is required.
- There could be greater integration of different means of public transport and as stated in the National urban Transport Policy, formation of an Integrated Metropolitan Transportation Authority to look after the fares and regulatory issues of buses, metro rail etc.
- There should be increase in the number of fare slabs to bring greater correlation between fares and kilometers travelled. Alternative fare structures can also be explored. This will also increase the revenues.
- Smart cards could be used in addition to the automated tickets in the buses and there could be common smart cards for buses as well as the metro rail.
- Careful designing of the uniform time table for both private and DTC buses is required.
- As far as possible, all the reforms suggested in the above mentioned reform models should be incorporated.
- There should be greater involvement of transport planning experts for the planning process and Delhi Traffic Police for the enforcement issues. These different stakeholders should be included as members of the SPV.

#### 9. A SUMMARY OF DIFFERENT SYSTEMS FOR PROVISION OF BUS SERVICES

System	Advantages	Disadvantages
<b>1. Government Company acquires buses through own capital (DTC services)</b>	1. Easiest method for fleet acquisition	1. Government companies tend to have insufficient capital to acquire buses.
	2. Government company retains full control	2. Each additional bus requires additional staff of 7-10 persons.
	3. Existing facilities such as depots can be used	3. Government company will have a monopoly.
<b>2. Regulatory authority issues permits. (blue-line operation)</b>	1. No investments on buses are required to be made by the Government.	1. Competition may encourage irrational driving practices.

	2. no single operator enjoys a monopoly and this promotes market competition.	2. There would be no takers for uneconomical routes.
	3. in the blue-line case, the permits were issued for marginalized classes to provide them a source of living.	3. It becomes difficult to have monthly and other travel passes.
		4. Investment in infrastructure like bus stops has to be made by the Government.
<b>3. SPV tenders routes to private corporates. (cluster approach )</b>	1. No investments on buses is required to be made by the Government.	1. Tendency for operators to cut corners for maximizing profit.
	2. different stakeholders can be part of SPV-ensures better coordination and planning	2. Problems created during fare revision and if input costs increase.
	3. the SPV earns a steady stream of revenue.	
	4. competition in the market is replaced by competition for the market i.e there is no on-road competition	
	5. a set of profitable and unprofitable can be grouped into one set, thereby covering all the routes	

## 10. NEED FOR BUS RAPID TRANSIT SYSTEM

In view of the above addressed problems with bus transport, the reform model discussed emphasizes the need for dedicated bus corridors. Acknowledging the significance of the same, GNCTD has introduced Bus Rapid Transit Systems (BRTS), a high-quality customer oriented transit that delivers efficient and fast urban mobility. BRTS is a system of having dedicated bus corridors that make use of available space on arterial roads of cities to optimise flow of buses and enable higher passenger movement. Since it involves modification of the road and not just the bus infrastructure, the efficiency of the system and capacity of passengers transported depends on the system as a whole and not necessarily on the size of buses.

BRTS is aimed at achieving mobility of people over mobility of vehicles. Since a substantial proportion of our population take the bus to office every morning, BRTS is a system proposed to enable greater, quicker and a more efficient movement of persons. The system is a response to the criticism against car-friendly road networks: wide roads, flyovers, signal-free networks and ring roads that serve the needs of only 10-12% of commuters in Delhi. Such a road infrastructure has greatly contributed to marginalization of lesser-privileged categories of commuters, mainly pedestrians and two-wheelers. However, the BRTS entered Delhi amidst mounting media speculation and a general sense of dissatisfaction among some groups of people. The prime purpose behind introduction of BRTS in Delhi was easy, speedy, and efficient movement of buses, which was well served (exclusively on the BRT corridor), but it was at the expense of slower movement of car traffic. Nevertheless, with the long run perspective in mind of encouraging use of public transport (primarily buses), the BRTS can be seen as a suitable idea with a noble objective. Hence, there is not a doubt that BRTS is going to go a long way in providing appropriate incentives to people to travel by buses.

Before examining the scope for BRT, let us examine the causes behind why Delhi has been facing critical traffic problems for almost 15 years now. As a measure to deal with the traffic problems, the roads were continuously being widened, and flyovers and underpasses being constructed all over Delhi to increase the mobility of the commuters, yet the city roads seem to be in a constant state of stagnation. But was it really the solution? For example, GNCTD built more than 15 flyovers on Ring Road to increase the throughput. The condition has improved radically so far as engineering is concerned, but not necessarily in a mobility context. Ring Road has become completely signalfree, but not congestion-free. The planners forgot that infrastructure was suited to movement of private vehicles (cars in particular) and it resulted in neglect of public transportation system. More and more cars crowded the roads, replacing buses. Gradually, a second car came into the middle class delhi family for the working wife, and as the income grew, a third one for the kids and a fourth one for elderly parents and so on. With city's buoyant economy, cars have replaced buses on the roads and cyclists have switched to two-wheelers MVs. Pedestrians thus became the most marginalized commuters on the roads, with little space to walk and long straight roads without traffic junctions and zebra crossings. Flyovers have further reduced the mobility of such commuters in the midst of speeding vehicles.

Another factor that may be said to be causing jams on the city roads is an absolute lack of a sense of lane discipline. Vehicles in Delhi do not observe any kind of lane order, shifting rashly from one lane to another, resulting in confusion, jams and accidents. When the left lane was assigned to the buses it was with the idea that the buses will have their own right of way not interfering with the normal traffic. Also, there would not be any problem for cars and fast moving traffic to overtake buses halting at various bus stops. Left-lane buses made it extremely convenient for commuters to mount-dismount buses since bus stops were built along the footpath, thus also adding to the safety of pedestrians and bus commuters.

Since we have left-lane driving in India, and speeding vehicles, by rule, are supposed to overtake from the right, hence the right lane is generally taken up by the fast moving traffic. As a result, the right side of the road was mostly occupied by the accelerating MVs, leaving the left hand side free for buses, since they have to decelerate every now and then to offload passengers, often even at places not officially designated as bus stops.

However, the problem arose when other light vehicles that were slow moving as well, too preferred to occupy the extreme left side of the road, the lane that was dedicated to the buses. This resulted in conflict between bicycle and motorcycle traffic with the bus traffic. These vehicles moving close to the pavement forced the buses to stop away from the actual bus stop, that is, in the middle lane, causing cars to get stuck behind buses halting at bus stops, resulting in confusion and obstructing the smooth flow of traffic.

In addition, the left turning traffic caused buses as well as the entire traffic to slow down, resulting in congestion, accidents and jams on roads that were otherwise wide and spacious.

## **11. INTRODUCTION OF BRT**

Concerned with the rising pollution caused by motor vehicles and the accident rates in Delhi, the Government of Delhi set up a Committee on Sustainable Transport in 2002. This Committee submitted its report in October 2002 and its main recommendations were as follows (Appendix 1):

### **A) Public Transport Policy**

Inter-se priority should be accorded in descending order to:

- Mass transport,
- Non-Motorized Transport (NMT) namely bicycles, cycle-rickshaws, pedestrians etc.,
- Intermediate Public Transport (IPT) namely auto-rickshaws, taxi etc., and
- Personalized motor transport.

**B) Priority bus lanes** be immediately implemented on five identified corridors

Government of Delhi in January 2003 entrusted a study to be carried out by the M/s RITES in association with IIT Delhi to identify High Density Traffic Corridors. On basis of the study, the Committee on Sustainable Transport then recommended taking up 14 road corridors for implementation of Bus Priority Schemes. These were selected based on:

- The available right-of way of major road/corridor and
- The present level of bus services operated on such corridors

Out of the initial 14 corridors, inter-se priority was worked out, and five corridors have been identified to be considered in the 1st Phase. Table 1 lists the first five priority corridors. This prioritization has been carried out with a view to:

- Have a uniform distribution of these facilities through out the Delhi Urban Area
- Avoid duplication of such facilities on roads which are parallel to MRTS/IRBT corridors
- Ensure that the corridors, to the extent possible, have bus terminals at both ends.

**Priority BRT corridors for Delhi**

S.No.	BUS CORRIDORS	LENGTH (Km)
1.	Nangloi – Peeragarhi – Punjabi Bagh – Anand Parbat – Rani Jhansi Road – Link Road – Gole Market – Shivaji Terminal	20
2.	Azadpur – Wazirpur Industrial Area – Punjabi Bagh – Raja Garden – Naraina Vihar – Dhoola Kuan – Moti Bagh – South Extn. – Mool Chand – LSRC – Nehru Place	32
3.	Jahangirpuri – Azadpur – Rana Pratap Bagh – Malkaganj – St. Stephen’s Hospital – Mori Gate – Old Delhi Rly. Stn	12
4.	Dr. Ambedkar Nagar – Masjid Moth – Mool Chand – Sundar Nagar - Appu Ghar – Delhi Gate – Lal Qilla – ISBT	19
5.	Anand Vihar – Karkarduma Chowk – Swasthya Vihar – Lakshmi Nagar – ITO – Bara Khamba Road – Shivaji Terminal	15
	TOTAL	98 (Approx 100)

The Transport Department of the Government of Delhi organised an International Workshop "Bus Rapid Transit Delhi" in December 2005 to evaluate the designs proposed. This was attended by all stakeholders (65 including 4 international experts specially invited for the purpose). The designs were approved and recommendations presented to the Chief Minister of Delhi.

In parallel the Government of India announced a National Urban Transport Policy in 2005 which states that:

- *"Encouraging integrated land use and transport planning in all cities so that travel distances are minimized and access to livelihoods, education, and other social needs, especially for the marginal segments of the urban population is improved."*
- *"Bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus."*
- *"Enabling the establishment of quality focused multi-modal public transport systems that are well integrated, providing seamless travel across modes"*
- *"Encourage greater use of public transport and non-motorized modes by offering Central financial assistance for this purpose."*

The proposal for construction of the first corridor finally got an approval by the Government of Delhi in 2006. Delhi Government then initiated the implementation of Bus Rapid Transit and this was followed by a provision of Rs. 100 crores under plan scheme 'Development of Alternative mode of Transport' in annual plan of 2004-2005. A decision was taken by the government to construct the first corridor on the stretch Ambedkar Nagar – Masjid Moth – Mool Chand – Sunder Nagar – Appu Ghar – Delhi Gate – Lal Quilla – ISBT.

The BRT concept for this corridor includes the following features:

- Segregated bus lanes in the centre of the Road, for uninterrupted traffic movement
- Safe pedestrian and commuter movement at all locations
- Segregation of slow traffic such as bicycles to ensure efficiency

These features were in line with the priority accorded to the different modes of transport by the Public Transport Policy introduced by the Committee on Sustainable Transport.

To implement this scheme the Government of Delhi appointed RITES Ltd. as the Project Management Consultant and Delhi Integrated Multi Modal Transit System (DIMTS) as a

Special Purpose Vehicle to oversee the operation and maintenance of the existing corridor as the Corridor Manager.

RITES Ltd., a Government of India Enterprise, provides engineering, consultancy and project management services in the transport infrastructure sector. Since its inception in 1974, company has made steady progress and diversified into new areas of business such as, export/leasing, maintenance and rehabilitation of railway rolling stock, operation and maintenance of railway systems under concession agreements and Build Operate Transfer (BOT) and Public Private Partnership (PPP) projects.

RITES Ltd. took professional advice to develop conceptual guidelines and design details for the BRT system from Transport Research & Injury Prevention Programme (TRIPP) of the Indian Institute of Technology (IIT) Delhi and prepared a detailed proposal for the above mentioned corridor.

TRIPP is an interdisciplinary programme focusing on the reduction of adverse health effects of road transport. TRIPP attempts to integrate all issues concerned with transportation in order to promote safety, cleaner air, and energy conservation. Faculty members are involved in planning safer urban and inter-city transportation systems, and developing designs for vehicles, safety equipment and infrastructure for the future.

## **12. CASE FOR CENTRAL BUS LANE**

TRIPP recommended that buses should be accorded the central lane for various reasons. The central bus lane has been a preferred location for buses in many cities all over the world, including Kolkata. It helps to avoid obstructing the way of left-turning traffic, thus bringing efficiency in movement of vehicles, including buses unlike when buses on the curb-side lane are forced to stop for left-turning vehicles.

Moreover, high volumes of two-wheeler and three-wheeler traffic interferes with the movement of buses in the curb-side lane especially at the bus shelters where buses often cannot approach the designated bus-bays due to the three-wheelers parked there and the two-wheelers trying to overtake from the left-side. The difference in sizes of these vehicles sharing the curb-side lane also makes the situation unsafe for the smaller vehicles. A central lane for buses would thus address the safety issues of such commuter groups, as well as those of bus passengers who have to otherwise face the danger of being run down by a speeding two-wheeler while getting off the bus.

Secondly, in the case of curb-side lane, since people live and work on both sides of the road at least half the passengers have to cross the full width of the. Whereas with a central lane, only half the width of the road has to be covered on foot from the bus shelter, the latter arrangement requires a shorter red light signal phase for cars, which increases safety all round.

Moreover, there has always been an urgent need for lane segregation especially on busy routes. It is not rare to see two wheelers and motorcyclists driving in a zigzag manner trying to move into gaps and spaces between MVs. Cyclists, too, strive to carve out a niche for themselves in midst of speeding traffic, and often risk being hit by a speeding bus, given that the both use the left-most lane in the present scenario. Hence, the need for having separate lanes is undeniable, in order to ensure the safety of all commuter groups.

### **13. IMPACT ON DIFFERENT COMMUTER GROUPS**

A policy is said to be good if it benefits the majority of the affected parties.

Given that the prime advantage of a BRT is that it enables a faster bus service, it favors the interests of a majority of the commuters in Delhi. For example, for the ambedkar nagar to delhi gate corridor, a survey conducted by RITES revealed that 55% of the commuters using the route travel by bus. Buses currently carry 100-120 passengers on average, and are the cheapest mode of transit in Delhi. Increased efficiency of bus service on popular routes and passengers being conveyed to their destinations on time at an affordable price is something Delhi is eagerly looking forward to.

With a central bus lane, passengers not only get to avoid the traffic speeding from the left of the bus; besides safety, it also adds to their comfort factor.

#### **13.1 Bus Commuters**

Commuter comfort is judged by reduced walking distance to access the system. Since the bus stop is located in the central lane, passengers changing routes and directions now get to walk much lesser. In addition, it also makes it easier for people exiting from their homes and workplaces to access the bus stop, for now, they need to cross only half the width of the road, which is, two lanes at a time. The advantages to bus commuters are innumerable, in terms of both safety and comfort, and are going to multiply all the more, once good quality buses get injected into the system.

#### **13.2 Pedestrians**

The benefits to pedestrians coincide with those of bus commuters, with respect to comfort as well as safety. In a typical six lane divided urban arterial road, where the bus lanes for both directions are on the curbside all commuters and pedestrians are required to cross a total of 12 lanes in a return trip. Segregating bus lanes from motor vehicle lanes using medians, provides a double benefit of enabling pedestrians to cross only two lanes at a

time generally at a safe controlled crossing, along with bringing lane discipline to the roads. A shorter safe pedestrian crossing time thus also adds in a comfort factor.

### **13.3 Cyclists and Two-Wheelers**

Cyclists, and often two-wheelers too, together make up the slow moving vehicles, that find comfort in occupying the extreme most lane, originally allotted to buses. Many an accidents have been reported where a cyclist or a two-wheeler bus had been hit by a speeding bus, or perhaps even a halting bus approaching a bus Queue Shelter (BSQ). 28% of our population has income below Rs.2800, which means bus fares would account for a good proportion of the monthly income of a worker. For such persons cycles provide an affordable and efficient means, except that they have to compromise on their safety for the same. The city infrastructure, with ring roads and flyovers and underpasses, has no road space for roughly a fifth of the population. BRTS by providing a segregated lane to cyclists and two-wheelers address the safety issues of this commuter group.

### **13.4 Car owners**

Comfort, safety and efficiency of motor vehicles in the city of Delhi is hampered by the friction with slow moving vehicles, buses at bus shelters and encroachment on the carriageway by parked vehicles, hawkers etc. A lane or two all to themselves is the best private car owners ask for, and BRTS fulfils their demand. However, the first BRT corridor was implemented on the current stretch without expanding the width of the road, thus reducing the net space available to car users.

The main criticism against BRT, thus, has been constantly jammed car lanes, particularly during peak traffic hours; the waiting time for cars varying from 10 minutes to more than 30 minutes at times. Thus, most of the opposition to BRTS comes from this commuter group. But this is also exactly what TRIPP aims at: To lengthen the travel time in a car such that opportunity cost of traveling in a bus goes down.

## **14. SHIFT TOWARDS BUS TRANSPORT: A POSSIBILITY?**

According to TRIPP, if people are stuck in jams in their cars, and see buses speeding by, they would realize that it is more costly to travel in car in terms of time. But it isn't what should be the focus of the policy. An effort should be made to comply with the long run objective of promoting use of public transport by providing incentives to people to take the bus to office, and not just by increasing the cost of owning a car.<sup>7</sup> However, given the shortage of around 5000 buses, and the dilapidated condition of

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<sup>7</sup> See appendix 4

the blueline buses there is lack of sufficient incentive and facility to the public to commute via buses.

Even though it is not an uncommon sight in other countries to see executives going to office even on bicycles, but the hot and unpredictable climate of Delhi does not support a preference for such a system especially for those who can afford a car. To add, the buses are overcrowded and rusty and dirty, definitely not the preferred option for a car commuter who values comfort over time. Most delhiites would rather travel by car and spend extra 15 minutes on a certain stretch than reach office in dirty, sweaty clothes. The phasing out of these buses has far from started and even when it begins, it is going to take some time given that bid for only 1 of the 17 clusters has been finalized so far.

There are also a couple of factors that would obstruct increase in number of bus commuters. First, with respect to the DTC buses introduced recently, the seating capacity is quite limited. They may be cleaner and more spacious in structure, but if people have to travel long distances standing, cramped against each other, it defeats the purpose of the whole idea. Second, there have been supply side problems as the existing manufacturers are not able to supply the buses. The huge demand gap is only one of the reasons why a person would not prefer public transport. The poor quality of buses, and the lack of accountability are other factors. Until we don't have the high capacity low floor bus system in Delhi on the roads on a large scale, private vehicles will always be the preferred mode of transit. Comfortable and reliable bus transport is not just complementary to but also a pre-requisite for a full-fledged BRTS to come in place. The reason being that the bluelines, particularly, are rash, congested, stinking, have poor infrastructure, and likely to break down in the middle of route, due to lack of sufficient checks. Hence, there is an urgent need to speed up the process of acquisition of low-floor high-capacity buses and phasing out of bluelines, not just on paper, but also in terms of visibility.

Furthermore, the agencies now have to deal with another 'upcoming' incentive for people to travel by cars is the 'Nano invention', cheap, efficient and small; the best option for a growing middle class, with an ever increasing income bracket. With the coming of the Nano, more people are likely to give up their two-wheelers in favor of the small (and affordable) wonder, thus adding to congestion on the roads. The government needs to look at sustainable solutions, solutions that would be beneficial not only in the long run, but also suitable for dealing with the car traffic in the current scenario, until the road has enough buses of good quality and in good quantity.

## 15. CRITICISM OF BRT

In practicality, the problem with BRT lies not in allotting 2 lanes for around 35-40% of total motorized vehicle, which is cars, but the fact that the corridors have been built without caring to increase the width of the roads. Now the traditional argument (perhaps from TRIPP) would be that widening of roads have not provided sustainable solutions to the traffic problems of Delhi. But what has been overlooked is that construction of corridors has essentially reduced the width by taking up available road space (CAG report, 2007-08). Most roads that allow for two-way traffic have 3 lanes for each side and either don't have divisions or are separated by a central verge of much smaller width. By constructing specific corridors and bus shelters at the central verge of the road, the net availability of road space for other vehicles is bound to get reduced, leaving one or one-and-a-half lane for vehicles other than HCBs. Thus, care should be taken that construction of corridors doesnot shrink the road size and create congestion for other vehicles.

The CAG Report also criticized the Department for incurring excess expenditure of Rs.4.29crore on a 3 km stretch from Ambedkar Nagar to Chirag Delhi. This was in lieu of use of expensive material, namely concrete, in construction of bus lane, MV Lane and NMV lane and footpath. The expenditure for laying out concrete pavement was Rs. 2320/- per sq. meter, while the same was Rs.1608/- per sq. meter in Bituminous pavement. The concrete road was initially preferred to bituminous for better strength, longer life and less periodic maintenance, whereas, in cities like Jakarta and Beijing, only one of the lanes on the HCBS corridor is segregated by providing detachable railings. Thus, it was suggested by the Chief Engineer PWD that Delhi too should go for flexible pavements for HCBS Corridors, while maintaining rules/laws for lane discipline. *'This will not only reduce the cost of the project but would save great inconvenience to the road users during the period of construction.'*

However, the agencies realized midway the technical and financial difficulties with concrete surfacing, and switched over to Bituminous surfacing of MV lanes and bus lanes beyond Chirag Delhi.

Another fault with the design was that of having bus shelters in the middle of the road that posed danger for bus commuters crossing the roads. Hence, in the new design, the bus stops are now being built at the junctions so as to enable and encourage pedestrians to use zebra crossings for crossing the road, thus ensuring their safety. Foot-over bridge are also being included in the design for certain stretches due to public criticisms of lack of them, even though most planners continue to believe that most people prefer to not take the bridges, in order to save time and energy of going up and down. However, in many other cities, foot-over bridges have been built and are used on a very large scale as they connect the bus stops to the opposite sides of the road. It will be indispensable to handle the tremendous amount of pedestrian traffic crossing roads to board or alight the buses on the central lane, once bus transport becomes the most desirable mode of transport, and the BRT corridors the most popular routes in Delhi, which is what the planners essentially aim at.

The reason behind most of the faults with the initial 5.6 km stretch between ambedkar nagar to moolchand, (another being absence of timers at certain junctions), was that no Detailed Project Report (DPR) was submitted before constructing the said stretch, which mainly includes the feasibility study of the concerned project, and is absolutely essential, even prior to the preparation of the Comprehensive Mobility Plan (CMP) for any major project in the sector. In fact, according to one official, the stretch was built on basis of a Transport Demand Survey of 2003, extremely outdated in nature for the present context, given that vehicle population in Delhi grows annually at a rate of more than 6%.

However, this mistake too was taken care of for the remaining portion of the stretch, as DIMTS Ltd. has now been given the responsibility of preparing a DPR as well as transport demand forecast models.

## 16. RECOMMENDATIONS

There are many lessons which can be drawn from the existing pilot stretch from Dr. Ambedkar Nagar to Moolchand. Some of the suggestions are as follows:

1. Enabling connectivity of residential places and commercial hubs with BRT corridors, such as through feeder buses, provision of cycles for rent. Parking facilities near BRT corridors is being considered in the near future; however, it may not be a favourable option, due to limited space availability on roads. Parking facilities along with cycle sheds can also be built underground, but huge costs would entail for such construction.
2. Increase width of the road by an amount equal to the width of median construction
3. An effort may be made to separate corridors in a flexible way (and not by physical construction) and enable maintenance of lane discipline through enforcement of rules
4. Timers at all traffic signals on the corridor are extremely necessary to ensure safety of pedestrians and bus commuters crossing roads.
5. As suggested by DIMTS Ltd., it is necessary to enact a special BRT policy to regulate the system under fixed laws and rules
6. Greater involvement of transport planning experts, such as experienced profs from SPA, CRRRI etc. in conceptualization and designing, in order to have different views on the system and its working
7. it is absolutely pertinent to speed up the process of purchase of new buses, in order to meet the rising demand, encourage people to leave their cars at home and make the BRTS more effective as a system
8. A very valuable suggestion proposed by DIMTS, which is:  
*'the agency should install an intelligent traffic signaling system with vehicle tracking facility. On the existing BRT corridor, it has been observed that there is no set traffic pattern and traffic movement is very unpredictable. The static system of traffic light,*

*therefore, cannot sense the change in traffic pattern resulting in slow throughput and unutilized green time. An intelligent traffic system will not only synchronize the traffic signals on the corridor, but also on connecting routes to the corridor.'*

This measure is already in the pipeline, as bids have been invited for the same

8. Keeping in view the rising number of accidents. There is need to create awareness about a concept and a system as new and different as the BRT. Just like we have hoardings on metro rail platforms with graphical representations of Do's and Don't's, it would be prudent to have similar hoardings on traffic signals on the BRT corridors to enlighten people about how to make use of the system effectively and safely

## 17. A CASE STUDY

In this study the authors have tried to look at possible modes of conveyance from a student's point of view. 15 destinations have been identified of student interest and the method of reaching those points is examined from the origin which is taken as Lady Shri Ram College, New Delhi. A comparative analysis is then done between different modes of public transport in terms of fare, waiting time, and travel time. This task is undertaken to look at whether there are good options for a college student to use public transport, and how well they can substitute or complement each other.

### LSR TO GREATER KAILASH I

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (445)	3	16	32	5
AUTO	15	-	-	5
RICKSHAW	10	-	-	5-7
WALKING	-	-	-	10

**Comments:** Bus is definitely not the most convenient option, given the waiting time and the fact that it does not drop you at the exact destination (there is some 300metres of

walking distance involved). Auto will mostly not be an option since most of them are unwilling to give you a ride for such a short distance and that too, by the meter, which means they mostly end up charging Rs.5-10 extra. Hence, for a student, walking or catching a rickshaw would be most economical option in this case.

**LSR TO SAKET (PVR COMPLEX)**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (724+500)	8	6+16	12+32	35-40
AUTO	35	-	-	25

**Comments:** if the buses are running by schedule and assuming an average LSR student will be keeping track of not only the movie but the bus schedule as well, bus may not be such a bad option. This is because, the next best option, the auto, charges more than 4 times the amount, but saves only on ten minutes of time. However, in the end, it all depends on how much time the person ultimately has to spend waiting, and whether he/she is willing to wait that long.

**LSR TO SELECT CITYWALK, SAKET**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (442+534)	8	6+5	12+5	20
AUTO	30	-	-	15

**Comments:** Here, bus is the best option, and it is also efficient, in terms of frequency, time taken, as well as fare. Moreover, auto charges a much higher price, with little efficiency gain.

**LSR TO 3C'S, LAJPAT NAGAR**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (416)	3	44	44	5-7
BUS (442+MUDRIKA)	6	6+2	12+5	8-10
AUTO	25	-	-	5
RIKSHAW	20	-	-	10

**Comments:** The route 416 is definitely ruled out given that the frequency is really poor. The other option by bus is comparatively convenient, but it involves changing bus after one stop, crossing to the other side, and catch the bus coming along. Changing buses for such a short distance isn't always the preferred choice.

#### **LSR TO DEFENCE COLONY**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (440)	3	8	16	15
AUTO	30	-	-	8-10

**Comments:** Bus is here the most desirable mode, since most commuters will not be willing to pay 10 times the price to reach 5-7 minutes in time, unless the buses plying are over-crowded and with no sitting/standing space.

#### **LSR TO SOUTH EX**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	

BUS (442)	3	6	12	5
AUTO	20	-	-	5

**Comments:** Here, again, bus is the most economical and convenient option , given it fulfils certain basic criteria of safety and space.

### LSR TO ANSAL PLAZA

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
*BUS (440+413)	6	8+12	16+12	15
AUTO	20	-	-	5

**Comments:** Fare by auto is 3 times that of bus and time taken exactly one-third. Hence, it depends precisely on how one values one's time.

### LSR TO KHAN MARKET

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (440)	5	8	16	20-25
AUTO	37	-	-	15

### LSR TO CANNAUGHT PLACE

	FARE	FREQUENCY	TIME TAKEN
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	(in Rs.)	(in minutes)		(in minutes)
		Peak	Off-peak	
BUS (435)	10	n.a.	n.a.	25
BUS (440)	10	8	16	40
AUTO	45	-	-	20

**Comments:** The bus route 435 has particularly low level of frequency, even though it provides relatively quicker service. In contrast, 440 in spite of having higher frequency, takes a longer route to the destination.

### LSR TO NORTH CAMPUS

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (416+Mudrika)	13	44+2	44+5	75
RIKSHAW+BUS(Mudrika)	20	2	5	75
AUTO	85	-	-	50
BUS(440)+METRO	21	8+4	16+8	50
AUTO+METRO	56	4	8	30

**Comments:** A student has quite a couple of options to travel to the north campus, which is good and necessary, given that feasibility of participation in inter-college fests depends very crucially on this aspect. Here, the option listed last, '*Auto+Metro*' is the most economical and efficient. Taking a bus to the metro station too isn't a bad option, if the person is willing to spend 20 extra minutes traveling for less than half the amount otherwise. Comfort and space are also very significant aspects influencing the decision. However, what is undisputed is that the student is sure to take the metro, and from the destination station too, there are a couple of options available to reach the desired point, such as rickshaws, cycles-on-rent, and feeder buses, each of them playing a very important role in themselves.

### LSRC TO CHANDINI CHOWK

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (425)	10	16	16	60
AUTO	60	-	-	45
BUS(440)+METRO	21	8+4	16+8	45
AUTO+METRO	56	4	8	25

**Comments:** in both the cases, this one and the one above, 'Auto+Metro' provides both a quicker and a cheaper option than taking an auto all the way to the point of destination. This highlights the significance of the metro as a mode of travel, not only for the working class, but for students and tourists as well.

### LSRC TO ISBT KASMERE GATE

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (447)	10	36	72	60
AUTO	70	-	-	50
BUS(440)+METRO	20	8+4	16+8	50

### LSRC TO VASANT KUNJ

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	

BUS (864+602)	10	PTS	PTS	30
AUTO	50-55	-	-	20

### **LSRC TO PRIYA CINEMAS, VASANTVIHAR**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (442+623) +RIKSHAW	20-25	6+8	12+16	30
AUTO	45	-	-	20

### **LSRC TO NEW FRIENDS COLONY**

	FARE (in Rs.)	FREQUENCY (in minutes)		TIME TAKEN (in minutes)
		Peak	Off-peak	
BUS (442+534)	8	6+5	12+5	25
AUTO	30	-	-	10

**Comments:** This location is taken up as an example of a place of residence. Here, again, Rs.30 is not what the auto-rickshaw drivers are willing to settle at. The fare generally demanded is anything between Rs.35-50., which is highly unreasonable for a distance of a little over 5kms. But at the same time, 25 minutes too long a time for a distance as short as this. Moreover, the BSQ is on the main road, so there is some distance that has to be walked down or a rickshaw may have to be taken to reach the exact point. To add, the

said route (534) is one of the busiest and most crowded ones, and the frequency stated above is not always what is adhered to, in practice.

## **Inferences**

Given the shortage of buses in Delhi, the frequency of buses is halved by the evening, which technically involves peak-traffic hours with people returning home from office. This leads to delays, overcrowding and discomfort.

Another problem is that of the shortage of Red A/C Bus services. As we know, they have been implemented on very few routes (9, to be exact) and are quite less in number. Hence they have such poor frequency; to illustrate, 440 A/C has a frequency of 90 minutes during peak hours and 120 minutes during non-peak hours. Such deficiency of quality services has made comfort a luxury to be enjoyed in all rarity.

Often a person has to cross the road to change routes, such as at Nehru Place, where the facility of subway can be availed, and is of utmost significance due to wide roads and heavy traffic on the roads. Currently, Metro rail service can be used only in complement with bus or auto, for a resident of south Delhi, whereas rickshaws are used in complement with autos and buses; Metrorail are provide means of mass transit across long distances, whereas rickshaws are indispensable in helping you arrive at the exact point of your destination. However, seeing the popularity of the service in north campus, there is also a need to promote the concept of renting cycles at important bus terminals and metro stations.

In the above exercise, naming metro or auto as the preferred mode of travel does not imply that the buses have no significance on the routes. In fact they provide an alternative mode of travel to those who cannot afford the above said means. On the other hand, the routes on which buses are said to be the preferred mode, need to have alternatives of better services of higher quality, such as metros or simply, low-floor buses and Red A/C services. Those who cannot afford any other means or do not have any other alternative, have no obligation to be denied the "luxury of comfort". And nor shall they be, with the metro rail coming to South Delhi by 2010 and phasing out of bluelines expected to be starting soon.

## **18. CONCLUSION**

With the above discussion it is clear that the Government is committed to improve bus services in Delhi. The system of Corporatization of private carriage is a great idea and has the potential to provide a solution to the present problems, provided it is implemented with professionalism on the part of implementing and monitoring agencies. Care must also be taken by regulating agencies that healthy competition is maintained between the private operators and the DTC plying on the same routes. Greater uniformity in infrastructure and systems of various buses is an indispensable feature of the future model. The introduction of bus rapid transit system (BRTS) has also a long term objective to enable a shift towards public transport but this objective has a long way to go seeing the current pace at which it is moving; there is already a delay in the purchase of new low floor buses in spite of repeated orders and sanctions by the Government. The bidding process for the corporatization of private carriage is also getting delayed and the possibility for the completion of the process before the Commonwealth Games 2010 appears bleak. The government has been talking about the need to phase out the blue-lines right since 2002 but till the present date blue-lines occupy a major proportion of city buses. Even though the Government has taken interest and initiated various projects in the above regard, it lacks stimulus and there are various issues that need to be addressed as pre-requisites. For example, there needs to be a comfortable supply of good quality buses before laying down the BRT corridors. In addition, there is need to more closely examine the scope for and design an integrated multi-modal transit system, with sufficient alternatives for modes of transit and ensuring complementarities among the existing modes.

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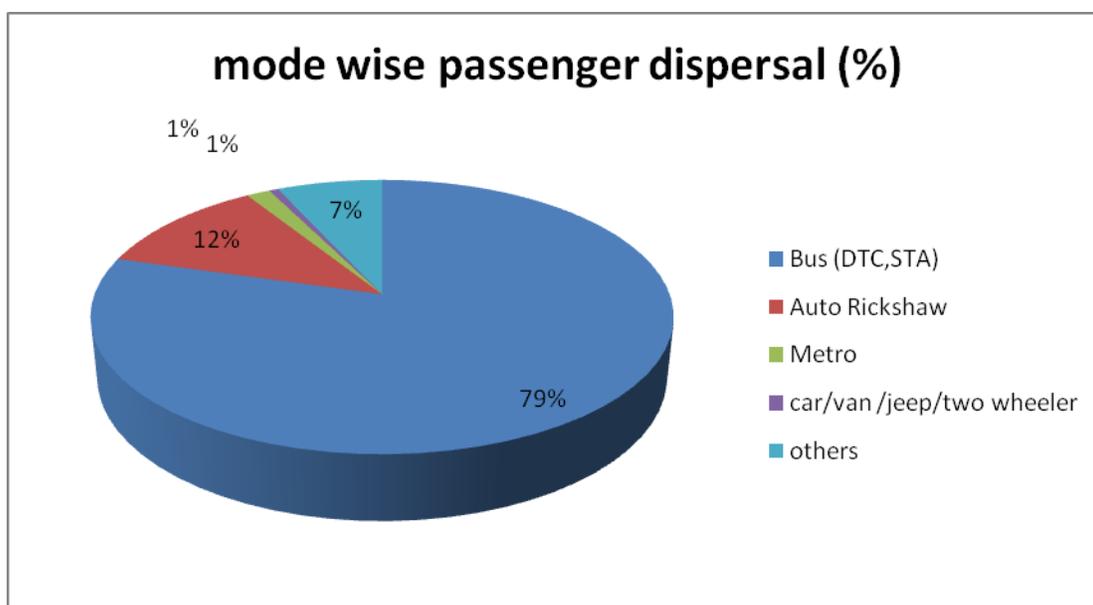
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## 20. APPENDIXES

### APPENDIX 1



### APPENDIX 2

#### ANALYSIS OF THE PRESENT SYSTEM AND THE CLUSTER APPROACH IN TERMS OF SERVICE PARAMETERS FOR A CONSUMER

PARAMETERS	PRESENT SYSTEM	CLUSTER APPROACH
<b>1. Safety</b>	The excessive competition on road, absence of a monitoring system, poor quality of service by the traffic police and enforcement officers,	Trained and qualified drivers, absence of on road competition, compliance to service specifications, provision of GPS tracking in case of a mishap, efficient monitoring system

	inadequate driver training lead to low level of safety in the buses	ensure safety to the passengers.
<b>2. Reliability</b>	Absolutely unreliable bus service is reflected in non-adherence to time tables, schedule curtailment, long waiting hours and passenger anxiety, high level of breakdowns.	Penalties for non-adherence to schedules and bonuses for performance improvement increases the incentive for reliable service, high level of maintenance of the buses and GPS networking reduce the level of breakdowns.
<b>3. Availability</b>	Buses are not available on certain routes which are unprofitable and the frequency in some cases is as low as one in 45 minutes	All clusters have a mixture of viable and unviable routes, making it mandatory to have buses on all the routes
<b>4. Affordability</b>	The current fares are highly subsidized and easily affordable	Fares will be revised but it comes with an improved service. Fares can be kept subsidized for the target income groups. For premium services fares are high thus offering a good choice to the commuter.
<b>5. Commuter friendly</b>	The behaviour of the conductor in the bus is not at all polite. Tickets are given only on demand. Seats reserved for women and disabled are not generally occupied by them	There are devices to record the identity of the staff on the bus making them fearful and incentivize for performing their duty and courteous behavior. Also tickets will be electronic available both on board and off board on the bus stops. Passenger information systems on the bus stops and in the buses to provide information of the arrival of the next bus or stop and the time.
<b>6. Comfort</b>	The buses are overcrowded, dirty; most of them are non-a/c, with poor upholstery.	The buses have to conform to the maintenance specifications too, these will be a checking on a daily basis for cleanliness, More no. of a/c buses to be introduced; premium bus service is a high quality service with level of comforts.

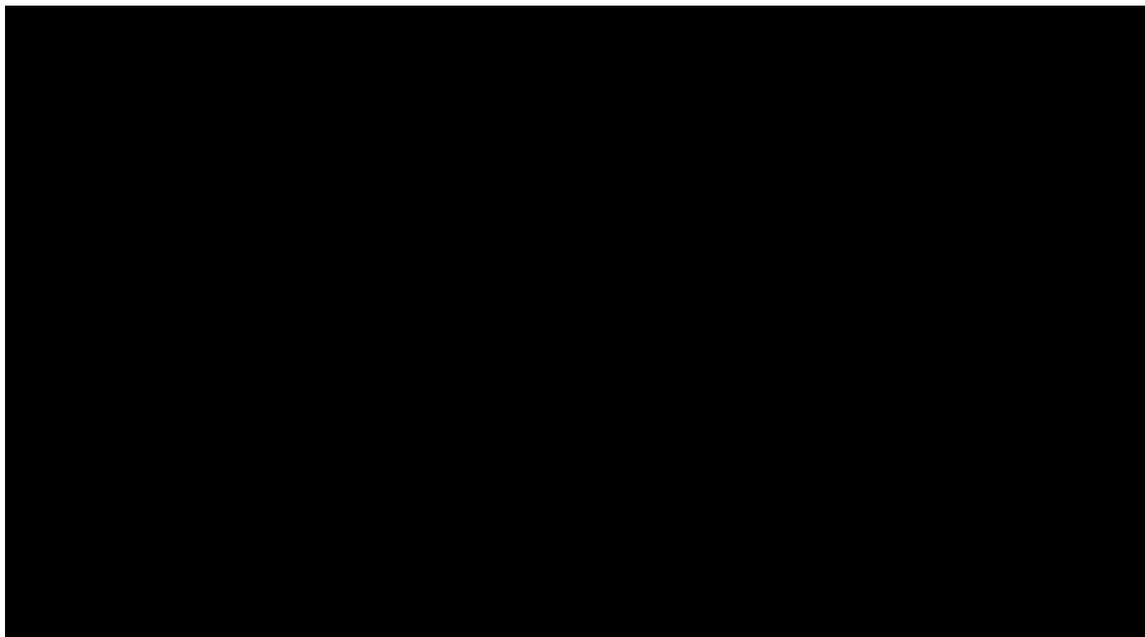
### APPENDIX 3

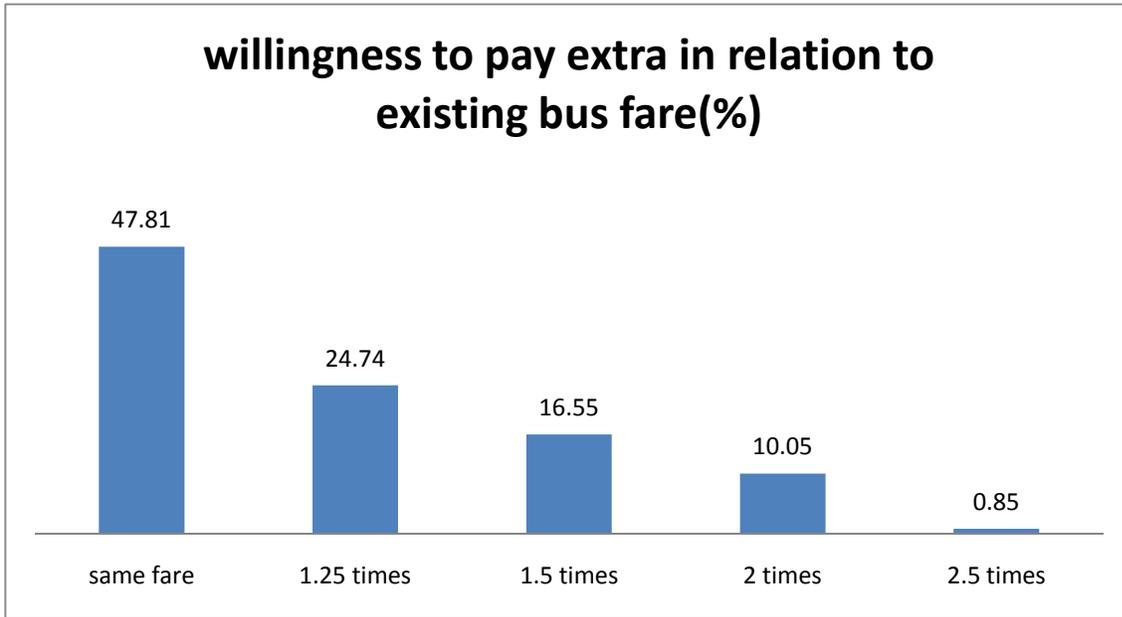
#### A LOOK AT THE SCHEMewise BUDGETARY ALLOCATION AND EXPENDITURES OF THE TRANSPORT DEPARTMENT

S.No.	Name of the scheme	Approved outlay for 2008-09 (total) Rs in lakhs	Expenditure till December 2008 Rs in lakhs
1.	restructuring and revival of DTC	64121.00	20000.00
2.	Motor Driving Training Schools	25.00	0.00
3.	MRTS studies	100.00	0.00
4.	providing of parking facilities	No data	No data
5.	Setting up of Delhi Unified Metropolitan Transport Authority(DUMTA)	5.00	0.00
6.	DIMTS	100.00	0.00
7.	Training of School Bus Drivers and Non DTC bus drivers	120.00	20.59

*Source: Scheme wise budget estimates 2008-09 and expenditures upto the month of December 2008, Transport Department*

### APPENDIX 4





Source: RITES Primary Survey 2007