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Public Private Partnerships in City Bus Services- Imperatives for a Sustainable Ecosystem in context of Indian Cities

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Abstract

City bus services are an essential component of urban mobility in cities of developing countries. One of the limitation in successful delivery of city bus services in these cities is the lack of adequate financial resources. In this context public private partnership (PPP), a flexible form of privatisation, provides a source of contracting out city bus operations .Public Private Partnership in recent times has been widely used for delivering quality urban services in cities across the world. However its usage in the delivery of city bus services have had mixed responses especially in cities within India. A critical review of PPP application in city bus services globally reveals that there seems to exist a favourable environment or eco-system under which the PPP initiatives undertaken are successful. This paper aims to identify the parameters affecting the sustainability of the Public-Private-Partnership (PPP) in city bus systems based on experiences in some of the successful global best practices namely, Seoul, Bogota, Singapore and London. It critically reviews the reforms undertaken in case cities at various stages for the implementation of the PPP through a structured analysis. A framework for evaluating the case studies comprising of the situation before PPP, policy reforms, institutional reforms, regulatory reforms and financing mechanism along with impact of the PPP has been used to analyse the case cities. It provides an insight on reforms undertaken and suggests various pre-requisites as a part of sustainable eco-system of PPP model in city bus systems.

Peer-review under responsibility of WORLD CONFERENCE ON TRANSPORT RESEARCH SOCIETY.

*Keywords:*PPP, BRT, Bus Services, Contracts, Institutional Reforms, Regulatory Reforms, Financing, Eco-system

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1. Introduction

Public-Private-Partnership (PPP) is arguably a more sophisticated and advanced form for contracting out the delivery of services to the private sector by the government and is being touted as an increasingly common practice as stated by Halachmi (2010). In his study, Savas (2005) described PPP as a more flexible form of privatization, wherein the government enters into an arrangement with a private entity to jointly carry out an activity that hitherto lied exclusively within the public realm. City bus services, in particular, occupy a key position in the long list of urban services which over time have been contracted out to private sector in search of a better and more efficient delivery mechanism as cited by Parashar and Dubey(2011). Given the inconsistency in funding at Central Government level in India and inability of State/cities to do the same, it is important that cities in India explore alternate sources for developing their city bus systems. The role of private sector in expanding the urban bus system has been identified as one of the efficient ways which is also suggested by National Urban Transport Policy (2006). The private sector can be explored not only in financing but also in improving the operational efficiency of city bus transport system. Time and again, various cities in India attempted PPP in different forms in city bus system with varied degree of success. Despite the fact that PPP is the efficient way of delivering the service, experience of PPP in city bus services in India is not so encouraging and posed a question on its effectiveness.

Nomenclatures

PPP	Public Private Partnership
BRT	Bus Rapid Transit
IUT	Institute of Urban Transport, India
SMG	Seoul Metropolitan Government
BMS	Bus Management System
STU	State Transport Undertaking
SPC	Special Purpose Companies
GoI	Government of India

11.2.3. Urbanisation and Motorisation in India

India like many other developing countries is urbanizing at a very rapid pace. As per census of India 2011, more than 31% of India resides in the urban area. Indian population is growing at an average rate of around 2% per annum. It has increased from 1.0 billion to 1.2 billion between 2001 and 2011. As per McKinsey (2010), India's urban population is expected to be around 600 million by 2030 with 68 million plus cities as indicated in fig 1. Urban India is driving the country's economic growth and is expected to contribute 70% to India's GDP by 2030.

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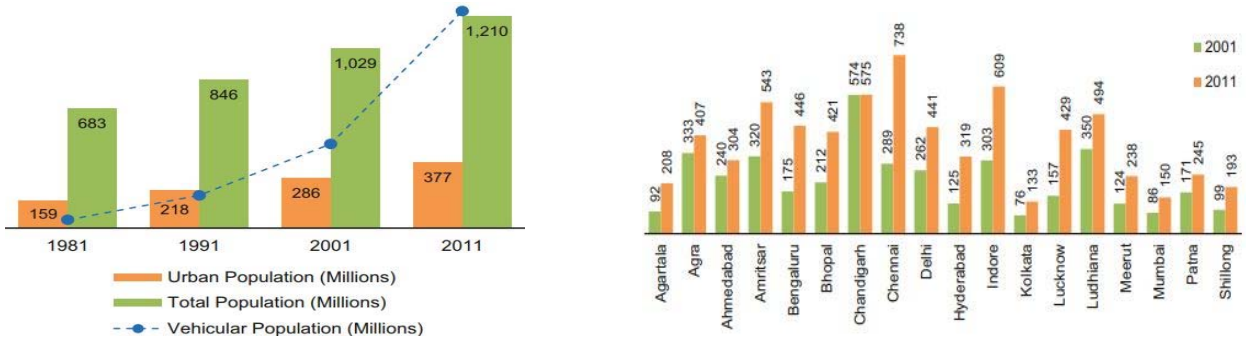

Fig. 1. (a) Urban population and Vehicular increase in India between 1981-2011(Source: IUT;CSTEP 2014); (b) Motorization Trend (Vehicle/1000 people) in major Indian cities (Source: MORTH, GoI 2013)

According to Ministry of Housing and Urban Affairs (MoHUA) 2008, the daily passenger trips in 87 important cities of India is expected to double up from 229 million in 2007 to 482 million in 2031. India had approximately 11% of the annual rate of growth of motor vehicles during the last decade with 90 million vehicles during 2005 that increase threefold to 150 million in 2015 as reported by Society of Indian Automobile Manufacturers(2017). By 2025, the vehicle population is expected to touch 375 million. As on March 2011, 2 wheelers account for the largest share (72%) among the total registered motor vehicle of the country, followed by 4 wheelers (cars, jeeps and taxi) with 14%, other vehicles (8%), goods vehicle (5%) and buses constituting only 1% as per report by MORTH (2013).

As per estimates, motorized passenger travel demand in cities would be doubled by 2021 and tripled by 2031 as compared to 2011. Cities with a population of less than 1 million will contribute 30% to this demand and another 30% will be from cities in the 1-5 million population bracket. The smaller and medium size cities are anticipated to emerge as economic hubs with relatively faster growth rates as reported by CSTEP and IUT(2014).

21.2.3. Urban Transport Requirement and Investment

As per the projections made by National Transport Development Policy Committee (2014) subgroup on Urban Transport, the number of cities with population more than 1 million will increase to 73 by 2031 as compared to 53 in 2011. Table 1 shows growth in number of cities for 2001, 2011 and 2031 in various population ranges.

Table 1. Growth in number of Cities in various population ranges

Population Size	2001 (Actual)	2011(Actual)	2031 (NTDPC)
>10 million	3	3	8
0.4 -10 million	4	6	6
0.1-0.4 million	27	43	59
0.05-0.1 million	39	44	66

As per the estimates made by National Transport Development Policy Committee, by year 2031, an investment of 10900-18500[2] billion Rupees would be require in urban transport; of which approximately 55% would go in public transport. As per the same report, urban India would require approximately 196,000 buses with an investment of Rs 1181 billion Rupees. In bigger cities, the urban rail system plays a lead role complemented as well as supplemented by buses. However, buses will remain the key transit system in majority of the Indian cities considering the geography of the cities that are characterised by sprawl with mixed land use and smaller average trip lengths of less than 6-7 kms. Thus it is apparent that demand for buses in urban areas will continue to grow.

31.2.3. Need for Private Sector Participation

For the existing supply of bus transport, as per the estimates, currently approximately 35,000 buses are being operated by the various State/ municipal/ city transport undertakings namely the State Transport Units (STUs) or Special Purpose Companies (SPCs). Considering a total estimated requirement of approximately 150,000 buses, there is huge gap in the current demand and supply of the buses. Most of these buses available in the cities are result of funding programs launched by the Central Government during 2009 and 2013 in which a total 170 cities, mostly small and medium in size were benefitted. The funding for buses as a part of National Urban Renewal Mission (NURM) by Central Government was announced after more than two decades and remains a one time program. Currently there are no funding mechanisms by the Central Government available for buses in urban areas.

On the other hand, as reported by Central Institute of Road Transport (2015), most of the STUs are loss making with the combined net loss for 2015-16 amounting to 113 billion Rupees which is higher than the previous years' by 7.2 per cent. Apart from poor operational efficiency parameters, the STUs are facing exogenous challenges such

[2] Sub-group report evaluated three scenarios namely; Business as Usual Scenario, Intermediary Scenario and Sustainable transport scenario

as stiff competition from unorganized/illegal operators, low fleet utilization, high level of breakdowns leading to cancellation of schedule, high staff ratio, salaries and pension liabilities, inability to revise fares with increasing costs, etc. This has rendered STUs with none or limited resources for expansion and replacement of fleet. Managerial problems and financial losses to the STUs on account of the city bus systems has caused neglect of the same and resulted in the loss of the image of a bus based urban public transport over the past decades. Inconsistency and ignorance at the policy level and inability of STUs to expand with the rising passenger demand resulted in reduction in mode share of buses from 11% in 1951 to 1% in 2011.

Emission from transport is another important issue that requires to be addressed that currently is placed next only to the industrial sector. The Intergovernmental Panel on Climate Change (IPCC) chapter on Transportation notes that urban travel is associated with issues of air pollution and is the biggest source of greenhouse emissions. India is also a signatory of the Paris Agreement and has declared its Independent National Determined Contributions (INDCs) to achieve a reduction in its total CO2 emission by 33–35% till 2030 as compared to the 2005 level. In addition, India is also committed to Paris agreement and implementing Sustainable Development Goals (SDGs). A modal shift from to sustainable public transport system is one of the key action areas towards achieving these International commitments. Given the inconsistency in funding at Central Government level and inability of State/cities to do the same, it is important that cities explore alternate sources for developing their city bus systems. The role of private sector in expanding the urban bus system has been identified as one of the efficient ways which is also suggested by National Urban Transport Policy (2006). The private sector can be explored not only in financing but also in improving the operational efficiency of city bus transport system.

2. Experiences of Private Sector Participation in Urban Bus System in India

12.2.3. PPP in city bus operations

In the capital city of Delhi, the transport corporation made an attempt at privatisation in 1964 through the Delhi Transport Corporation (DTC). Subsequently many more attempts like Administrative and Operational Control Charges(AOCC)and ‘Blueline Buses’ (1992) were made. While each successive attempt was essentially a variation between the Net Cost Model (NCC)3 and the Gross Cost Model (GCC)4, as depicted in Fig 3, none of them were successful for various reasons except the recent “cluster scheme” as explained in fig 2, which is a variant of GCC as studied by Parashar and Dubey (2011).

Similar attempts were made in the cities of Jaipur (1979) and Vishakapattanam (1978) but faced a similar fate like Delhi. Attempts made for involving the private sector were arguably ad-hoc measures with the absence of mechanism for setting up of service quality parameters for operation & quality of services as well as absence of institutional mechanism for regulating, controlling & monitoring the operations. For the past decade and since 2005, there has been an increasing interest in urban bus services by the private sector. This has resulted in the development of various Public Private Partnership (PPP) models for the same. As such, the philosophy while designing the Public Private Partnership (PPP) model dictates that the public agency be responsible for planning, regulation & monitoring of the system and infrastructure provision while the private sector be responsible for operations. More than ten cities in the country have initiated PPP in their city bus operations. After a successful inception year, barring few cities like Indore, Bhopal, Ahmadabad, Delhi, most of the cities could not sustain the arrangement on a

3A system of franchising the bus services, where franchisee keeps all the revenue. The franchise is granted to the most attractive bid i.e. ‘license fee offered’. The franchisee carries cost as well as revenue risk

4 A system of franchising the bus services also called ‘kilometer scheme’, where all revenue accrues to the government, which then pays the franchisee a fee for operating the service. The contract is awarded to the lowest bidder (least total cost). The franchisees do not carry the revenue risk and only bear the cost risk.

long-term basis and have either terminated the system or just exist. The status of the PPP bus services in the cities that have attempted PPP in bus operations is compiled in Table 2.

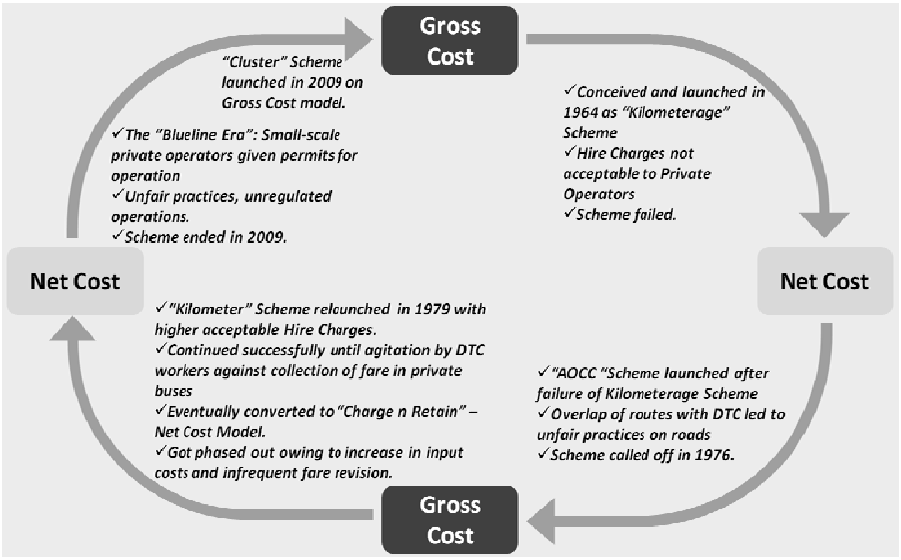

Fig. 2. Delhi 's induction of private sector in its city bus services through versions of Net Cost and Gross Cost models over past five decades

Table 2. PPP in city bus operations in different cities in India

City	Contract model	Operational since	PPP results
Indore	CBS: NCC BRTS: GCC	2005	Moderately Stable
Bhubaneswar	NCC	2010	Failed
Pune	NCC, GCC	2012	Failed
Bhopal	NCC	2013	Moderately Stable
Ahmedabad	GCC	2006	Stable
Surat	GCC	2016	Stable after failure of earlier attempt
Mira Bayander	NCC	Not operating	Failed
Jalgaon	GCC	Not operating	Failed
Jaipur	GCC	2010	Failed
Ludhiana	NCC	2015	Failed
Delhi	GCC	2011	Stable

22.2.3. Need for Understanding the PPP Ecosystem

It has become an acceptable fact that PPP is the way forward for sustainable delivery of city bus system but there have been continued failures that question its applicability to Indian cities. So far, PPP in urban bus service delivery has erroneously been transferred from one city to other without appreciating the availability of a requisite eco-system. PPP is an effective method in delivering sustainable city bus system, but its degree of success depends on the availability of the right eco-system and creation of a supporting environment in which it is being implemented. Absence of evaluation of the eco system is the reason why the same PPP methods give different results in different cities. Therefore, there is a need to identify the parameters that are important for the right eco system of PPP in delivering urban bus systems by evaluating global practices. Upon identification of such parameters any city desirous of adopting a PPP method, can be evaluated against such parameters. Depending upon the output of such an evaluation, corrective measures can be taken to further strengthen the eco system to ensure the sustainability of the PPP.

3. Global Experiences of PPP in City Bus Services

The present paper attempts to understand the existing eco system of PPP in case cities and identifies parameters impacting sustainability of PPP in urban bus service delivery. Four cities having success stories in this area have been chosen as secondary case studies namely, Seoul, Bogota, Singapore, and London. A descriptive due-diligence of reforms and initiatives taken in each of these cities is undertaken in the following section.

3.1 Seoul, South Korea

The capital of South Korea, Seoul with an area of 605 sq.km has a population of about 10 million residents as per 2015 statistics. The bus system is the most common means of transportation in Seoul a daily average 5,609,000 trips. As per report by EMBARQ (2010), public transportation in Seoul accounts for 62.3% of all motorized trips. Historically, from the 1960s till 1980s, the bus sector was the main mode of public transport as cited by Matsumoto (2006). Wright (2004) stated that prior to Bus Rapid Transit (BRT), there were 35,000 registered private bus operators. The government did not have control of schedules, routes, or other services aspects with and only fares being decided by the Seoul Metropolitan Government (SMC). Regulation of participation enabled existing bus operators to get monopolistic profit on most routes and to operate without any special subsidy from the government. The bus companies determined routes resulting in decreased efficiency due to disorderly winding and overlapping routes with poor management of bus schedules at the city level set independently by each bus company. The modal share of buses fell sharply as subway lines expanded with much of the drop being attributed to an increase in private car usage along with poor quality of bus services. The mode share of buses fell dramatically, from 65% of all vehicular trips in 1980 to 26% in 2000.

3.1.1 Policy Reforms

In 2004, SMG made many significant reforms in its transport policies with a shift from private to PPP (quasi-public) bus operation. The private companies operate the buses while the SMG managed the bus routes and revenues. Public bus services were then reorganized, exclusive median bus lanes were created along with an integrated fare card for commuting called T-Moneybeing introduced. The PPP bus system had three major components: First, SMG would decide adjust bus routes, evaluation system to examine service level,operational performance and fulfillment of contracts. Second, the consortium of new and existing bus companies was formed to take control of operations. Four consortia were formed comprising of five companies that would run buses along the identified trunk routes, which were additionally supported by measures like bus priority. Licenses were issued for six years chosen on total costs for bus operations bids on the routes. The private companies work on a contract with SMG, with tendering system to choose operator limited for trunk lines as cited by Mizokami (2011). Third, The city Government financially supported the operational bus-related infrastructure by supplementing the same to the operator. Additionally, to manage the revenue and information the SMG established a centre for fare settlement through subsidies.

Revenue was jointly managed and redistributed on operational performance and thus separating bus operation and revenue management. All the fares of bus operation were collected by the revenue pool management system of all profitable and unprofitable routes and were redistributed. Operation of the buses was also in a closed system by limiting busway entry to only qualified private firms.

3.1.2 Institutional Reforms

The Main stakeholders for the PPP were the SMG, Private Operators, Korea Smart Card Corporation and a Bus System Reform Citizens Committee and the National Government Bodies. SMG was responsible for route planning, service evaluation and routes' adjustment. It developed route plans based on operations information obtained from the Bus Management System (BMS) and the traffic card company. It has the power to fund schemes, provide financial support and conduct evaluations of operational services. It provides the gap funding and also conducts an

appraisal of the bus companies by offers of incentives and penalties based on performance. The SMG sections dealing with PPP comprises of the bus policy team, management improvement team, financial support team, route team, operational management team and the community bus team. It is also supported by the Transport Operation & Information Service (TOPIS) that collects information from & provides information to management systems responsible for providing traffic situations to Seoul.

Private operators consortiums operates the buses, reports on receipt of the revenue distributed, on operation details, and generates management related data. A smart card was introduced managed a Korea Smart Card Corporation that is responsible for operation and maintenance of the transport card system. SMG also formed a "Bus Reform Citizens Committee" for enabling civic participation as studied by Caris (2014). Established in August 2003, the committee also brings together all bus unions, bus companies, and civic groups and plays a crucial role in coordinating conflicts that arise among them. National government bodies comprising of the National Police Agency (NPA), Ministry of Finance & Economy, Ministry of Land, Infrastructure & Transport and have policy & licensing authority in Seoul. NPA participates in BRT investments, whereas Ministry of Land, Infrastructure & Transport and the Ministry of Finance & Economy participate in introduction of quazi-public bus system.

3.1.3 Regulatory Reforms

Prior to the transport reforms, the Seoul buses were not regulated and were highly competitive on profitable routes, plagued by high accident rates and poor services. The National Passenger Transport Act currently in force, promotes tendering. Further, the right-of-way for exclusive operation is protected as a judicial precedent by the Korean Supreme Court. Further, the Passenger Transport Service Act 2015 was enacted to promote public welfare through smooth transport of passengers with a focus on overall service development.

3.1.4 Financing

The financing model for the PPP is that Bus companies enter into gross cost contracts with the SMG and are compensated on the basis of bus-kilometres operated on particular routes and not on the number of passengers transported. Contracts are awarded on the basis of a competitive tendering process that promotes competition between the private bus companies. Through this system, the SMG managed to shift some costs to the private sector through advertising rights. Also, costs like developing transportation information system and also the building of major interchange centers were entirely sourced from the private sector. The Korea Smart Card Company (KSCC), the company hired to develop and run the payment mechanism, paid for the installation of all fare validation equipment onboard the buses and getting compensated with a 1.5% fee over each transaction that ensured that Government absorbed some of the private costs. SMG also provided 80% subsidy on the purchase of new, Compressed Natural Gas (CNG) buses with 55% being paid with central government funds and 25% with the funds from the city government. The bus companies also obtained a commitment from Government that in the event that the rationalization of the routes required reducing fleets, the Government would buy the redundant buses. Bus companies are also provided subsidies by SMG to ensure that no losses are incurred from the quasi-public operation.

3.1.5 Impact of PPP

With the Seoul bus reforms and introduction of PPP and supplementary changes, in 2011, the modal share of public transport contributed to a high of 65.1% of which with the bus mode comprised of 28% and subway accounted for 37.1%. The satisfaction amongst citizens for city's public transport increased from 58.2% to 81.8% in 2004 to 2005 respectively. The passengers increased to 5.5% on a daily basis which was 511,000 passengers a day.

3.2 Bogotá, Brazil

Bogotá the capital city of Colombia is the largest city in the country, with a population of 8.35 million in the metropolitan area in 2007. Transportation systems in the city experienced continues swaps between public and the

private sector as the main provider and the ownership structure setting changed several times. Up to the 70s, the sector was completely dominated by public city's company as the only legal provider of bus services. Later is witnessed a slow transition back to the private provision due to lack of flexibility and productive inefficiencies. Owing to corruption and multiple drivers per vehicle with increased financial resources and led to several traffic problems in the city as per Matuszewski (2015). At the peak, the city had 68 private companies providing services. All the companies had to get the exclusive right to certain routes set by the STT. The procedure of acquiring the concessions was based on the bid, competing against each other to get the route. Bus companies however didn't own fleet & would rent these routes to the small bus owning companies with a monthly fee called "Cupo" for each bus. Companies hired more buses than necessary to generate higher profits resulting in an oversupply. Bus companies had disproportionate power (affiliations with trade associations), political influence in the city & could also increase the number of routes issued by STT as studied by Matuszewski (2015). By the end of the 20th century, there were 631 routes in the city with over 22000 buses operating on them. Bus drivers collected fares and passed it over to bus owners daily who then pay a monthly rent to the bus company. Inorder to manage the transportation challenges, the Mayors office proposed the Bus Rapid Transit System (BRTS) and in 1999 TransMilenio S.A. was created with a representation from public agencies through PPP to create a rampant bus rapid transit system.

3.2.1 Policy Reforms

There was a shift from the several bus companies and bus owners to modern corporation to regain control over the underutilized and inefficient private system. TransMilenio was the Bus Rapid Transit (BRT) system introduced. Under the partnership of the transit system, the public sector would take care of the infrastructure financing of the system with a long term view the private sector would handle the operations, maintenance and construction of infrastructure. The important heads of the reform were:

- The city government through Transmilenio Co. issued bids that were competitive to finalise operators under a concession agreement. This concession was time bound unlike prior to the reform.
- Bus owners no longer paid rent to the bus companies for operating on routes and instead would rent the buses from owners. They were responsible for service provision, operation and maintainance of the buses and were paid by from the bus company monthly.
- Bus companies were responsible for collecting bus fares. It was a systems approach to cover cost for operations, fare collections, and Transmilenio Co. instead of costs per bus under the traditional system.
- Concessionaires were paid as per distances covered by their buses and not as per passengers transported as earlier.

The reforms existing since have seen addition of several complementary measures that support public transport usage. Initiatives included addition of 300 kms of new cycle tracks, pedestrian and public space upgrades, closing of 120 km of roadways to private motorized vehicles and world's largest car- free weekday on a Sunday and likewise. Additionally, forty percent of all private vehicles were banned during peak time through a license plate registration system along with introduction of parking restrictions. An increase gasoline taxes helped finance road maintenance & mass transit development as indicated in the Bus Rapid Transit: Planning Guide (2007).

3.2.2 Institutional Reforms

There were several governing bodies involved in the whole BRT system. Bogotás Mayor's office did the component related to designing, planning while the investments in infrastructure for the same was handled by public institutions such as Institute for Urban Development (IUD), Fund for Education and Road Safety of the Secretary of Transit and Transportation(FONDATT), District Institute of Culture and Tourism (IDCT), Department of Planning, Secretary for Transportation and Traffic, Secretary of Finance, and Metroviviend (BRT Project, Bogota, Columbia). TransMilenio S.A. was incorporated as a single state stock company to handle operations, planning and management of the bus system including operation of the control center and managing fleet and quantity of buses. There are three areas of management areas that it focuses on (2011 Agreement): Top Management, Integration Management, Management and Operation Control.

3.2.3 Regulatory Reforms

Colombia's mass transit legislation under which Transmilenio operates, allows open market competition that is different from the traditional mode. The Ministry of Transport acts as the regulator and oversees policies and plans, while the Municipality of Bogotá acts as the Secretariat of Traffic & Transport (STT). TransMilenio S.A. regulates the BRT system while the STT regulates the already coexisting old bus system. Operations are carried under strict conditions which are laid down in concession contracts and are controlled centrally. TransMilenioS.A operate through a consortia of transport companies that invite associated with national and international investments that supply the buses and drivers and maintenance personnel are hired staff. The bidding processes are open and are for a 10 years contract period with payment made based on kilometers run.

3.2.4 Financing

The Total costs of the system are estimated at US $2.2 billion (64% by National Government & 36% by District of Bogotá) with Phase I costing US$240 million, Phase II costing US$545 million and Phase 3 costing US$1.3 billion. The phase wise funding is depicted in table 2 below.

Table 2. Funding pattern of TransMilenio S.A. BRT

Phase	Year	Total Cost	Sources of funding
Phase I	2000	US$240 million	Local Fuel Taxes (46%, National Government grants 21%, world bank loan 6%, and other local funds 28%.
Phase II	2006	US$ 545 million	National Government 66%, local fuel charges 34%.
Phase III	2010	US$ 1.3 billion	National Government, City taxes

The BRT system does not receive any subsidies from the public agencies and is designed for total fare recovery. centralized fare collection system is followed and an increase in passengers, followed by increased revenue is forwarded to the operators and likewise, if costs increase or in cases where demand declines, the private operators cover the risk and losses. The role of the National and City Government is to cover capital costs. The fare collection is also privatized with an independent company called Trust Fund Administrator that is the depository of fares. The revenues are distributed to the private operators with 66.5% of revenues being provided to trunk lines and 20% of revenues provided for feeder services as per pre-determined sharing through negotiations at the bid level. Compensation for trunk lines is on kilometers served by buses along with incentives of bonuses as well as with penalties which helps in improving the quality of the service. Compensation for feeder line operators and the fare collector is based on a combination of revenues from a payment per kilometer traveled and the number of passengers served as per Wright (2004). Further distribution of fare collection allows 10% to the company collecting the fares, 3% to TransMilenio SA (additionally 4% through revenues of advertisements, etc), and 0.5% to the fiduciary company to manage income assets.

3.2.5 Impact of PPP

With the PPP based BRT system, modal share of bus share reached to 62% in 2008 as compared to the earlier 45% in 1999 as reported by ERIA, (2013) with the45% bus share comprising then of privately run buses. The introduction of PPP based BRT and its supplementary facilities ensured 2% contribution of bicycle transit in 2008, which did not shown in 1999. In addition, there has been a 32% reduction in travel times and in TransMilenio operating areas, there has been a reduction in number of deaths, injuries and collisions.

3.3 Case of Singapore: Pre-PPP Scenario

The island city-State of Singapore has a total land area of 719.9 sq. km with a population of 5.61 million as per Singpore statistics in 2017. The first efforts at organizing public transport in Singapore was in 1930s. The Singapore Traction Company (STC) Limited was established and offered a 30- year period to manage and operate buses within

the city. However due to weak enforcement, privately owned bus companies infiltrated and began providing bus services outside the routes assigned to STC. In 1935, the operators were thus merged into ten Chinese bus companies to centrally organize private bus operators for the first time. This coexistence of both government -owned and the ten privately- owned bus companies resulted in competition. As a result, by 1955, both the STC & Chinese bus companies had operational difficulties and management issues. Based on the recommendation of Transport Advisory Board (TAB), the amalgamation of the ten companies into three and rationalization of existing bus services, the disorganized situation continued to deteriorate and STC went bankrupt. It was in 1973 that the Government intervened and merged to form a Private single entity called Singapore Bus Services (SBS). But the amalgamation did not happen in reality and the owners continued to run the company with no proper accounting. In the 1980's, the government came up with the idea of a second bus company to ensure competition to SBS. Thus in 1982, the Trans-Island Bus Services (TIBS) was set up as the second major public bus operator.

3.3.1 Policy Reforms

Under the traditional System, all the assets were owned by the Government as well as the private operators that resulted in a low level of bus services due to the focus on profits. The sources of revenue were from mainly from fare collection and advertising, which was used to cover all the capital as well as operating costs and earn profits. Considering that bus services and operations itself are high investment areas, the ventures are mostly unprofitable and result more than often in poor services as in this case. Financial sustainability is a crucial aspect in city bus services which results in compromising with quality of services.

With the establishment of the Land Transport Authority (LTA) in 1995, a new system of PPP was introduced, that promoted owning of all related assets like bus depots, Buses, bus interchanges and the related management systems. The model followed by Land Transport Authority (LTA) is of comprehensive transport planning with buses being a major component of the inter transit, intra transit as well as the feeder systems. LTA would be responsible for planning and deciding on the bus services that needed to be provided by setting service standards for operators. Bidding was through a competitive process with the agreement for fixed fee for bus operations. The running costs were also borne by the Government fully and the revenues generated by fares is kept by the Government so that public transport s kept affordable to its citizens.

3.3.2 Institutional Reforms

The Ministry of Transport with its statutory bodies is responsible for public transport in Singapore comprising of the LTA and the Public Transport Council (PTC). The LTA was formed by a merger of the Mass Rapid Transit Corporation, Roads and Transportation Division of the Public Works Department, and the Land Division and Registry of Vehicles. It is the main authority for land and transport development within Singapore. The LTA sets policies, long-term transport plans as per the needs of the city and oversees all land uses as well as public and private transportation. It is a strategic planning unit for transport, related policy making, infrastructure planning, fare regulation and control and overall jurisdiction.

Fare pricing is an important aspect in Singapore and the government ensures that fares of public transport are kept affordable. For the same in 1971, the Bus Service Licensing Authority (BSLA) was set up to approve fares that were originally under the government. The Public Transport Council (PTC) was set up in 1987 to replace the BSLA which, in addition to ensuring public transport affordability, also looked into the long term viability of the transportation systems. The composition of the PTC is of 15 members with a cross section of the society from unions, academia, grassroots organizations, media, legal, logistics, accountancy and financial, business fraternity as studied by Teik-Soon Looi (2009).The role of PTC was expanded in 2005 to include licensing of bus operators, ensuring quality of bus services, regulating ticketing services, and enforcing penalties for fare evasions. In 2008, they were again given additional powers to undertake fare reforms and implementing distance based through faring system. The quality standards set by PTC are very high and PTC ensures that the same are followed by the

operators. As the PTC comprises of representation of all strata of the society, it is ensured that the interests of the citizens are protected.

PTC regulates not only the bus fares but also the rail fares in coordination with LTA. Beginning in 2009, LTA assumed the role of central bus planner and acts as a technical advisor and works with PTC in monitoring and tracking bus services and ensuring that bus service standards are met. LTA Acquired TransitLink in 2010 to allow for an integrated fare system across Singapores' varied transport system comprising of bus networks, Mass Rapid Transit (MRT) and Light Rail Transit (LRT). PTC has licensed TransitLink to handle all ticket sales and services.

3.3.3 Regulatory Reforms

The Bus Service Industry Act 2015 was enacted to regulate bus services, operators of depots and interchanges, and to lay down a procurement framework for buses and services with clear service standards as indicated by the Singapore Authority (2015). The regulations of bus services had morphed from the first OSLA in 1956 to BSLA in 1971 and to PTC in 1987. With each change, the statutory functions were strengthened to support policy and regulatory changes. In addition, the prevailing Road Traffic Act in force since 1961 was again revised in 2004. The Act was enforced to regulate road traffic and use of vehicles. It also dealt with the user of roads, operation of bus interchanges as well as for services related to regulating buses, taxis and monitoring rapid transit system fares and related matters.

3.3.4 Financing

In Singapore, LTA's budget for financing the capital cost of projects is funded primarily by grants from the government. In addition, it has an operational budget funded through a "management fee" that it receives from the government and certain other revenues that accrue to it, such as vehicle registration fees, advertising fees, and fines. During 2010-11, LTA received a total income of S$1,051 million, of which 38 percent was from management fee from government, 11 percent was other administrative fees like vehicle parking certificate fees, etc. and 51 percent was a grant from government toward operational expenditures. Singapore's public transport finance model depends on real estate development however, strong government policies prepared to supplement the efforts ensures that development is channelized onto the public transport corridors. The Singapore government's Land Transport Authority built and maintains ownership of the physical public transport infrastructure, and uses road tolls and vehicle ownership fees to pay both debt service on these investments and for upkeep. Despite the fact that these tolls and fees are high in Singapore, cover most of the cost of the public transport infrastructure as indicated by Shalon and Shewmake (2011).

3.3.5 Impact of PPP

The peak hour public transport mode is very high in Singapore. In 2013, it was 63% which increased to 67% in 2017. This shows that the continuous positive reforms and policy changes have been appropriate. The Land transport Masterplan 2030 aims to increase the same to 75%. Though the major part of the transit system comprises of the MRT and LRT, bus modes form a major part in the integration of the rapid transit system with a multi modal sustainable model. PPP in the services have ensured that service standards of quality, comfort and ease are maintained offering access, reliability, competitive journey times and affordable fares.

3.4 London, United Kingdom

London is the biggest city in United Kingdom with a population of 8.7 million (2011). On any given weekday, the London Bus System carries more than 6 million passengers on 6,800 scheduled buses and more than 700 routes which is much more than the number of passengers than the London Underground (metro). The London Passenger Transportation Board (LPTB) was established in 1933 to bring together the various public transport modes under one organization with the enactment of the London Passenger Transport Act. During this period bus services in

London were also supplemented by limited tram and trolleybus systems (EMBARQ). Over the years the LPTB went through several organizational, jurisdictional and name changes. LPTB was nationalized and became subsidiary organization of British Transport Commission under the Transport Act, 1947 and was known as the London Transport Executive from 1948-63 to be later replaced by the London Transport Board from 1963-70 after the British Transport Commission was dissolved. It was an independent statutory undertaking reporting directly to the Minister of Transport. During the period from 1970-84, the organization and once again named the London Transport Executive and was under the direct control of the Greater London Council (GLC), which was a high level local administrative body. This period also saw the re-definition of the London Transport Executive mandate to providing transport services for Greater London only, an area measuring 1580 sq. km. as reported by EMBARQ (2010).

The London Regional Transportation (LRT) Act in 1984 was an important milestone in the history of public transportation services in London. Bus services in other parts of UK and outside of London were completely deregulated through the passage of the Transport Act of 1985. This meant that any private company could provide bus services on any road, regardless of whether that road was already being serviced by another bus operator. London, however, was exempt from this deregulation. It was felt that bus services in London were too dependent on public funds, and that complete deregulation would impact service levels as reported by EMBARQ (2010). LRT set up the Tendered Bus Division in 1985, a unit responsible for initiating the competitive route tendering process. London Bus Limited (LBL), a subsidiary of London Transport and responsible for operating buses, was now required to compete against privately owned bus companies for the provision of bus services. In 1988, in a move designed to facilitate the privatization of bus services, LBL was divided into 13 separate bus operating companies, each with its own geographical area of service coverage. Each of these companies behaved like an independent entity; they maintained their own fleets, conducted their own labour negotiations and made independent financial decisions.

In 1992, the government sold the subsidiaries to the private sector and by 1994 LBL was privatized. In 1992, the Greater London Authority (GLA) was formed and in 2000,Transport for London (TfL) replaced London Regional Transport and TfL. London buses came under the TfL which being a government body, was controlled by the Mayor of London's transport organisation and was heading with the responsibility for managing all the transport services in London that were under the control of the GLA.

3.4.1 Policy Reforms

Several innovative contracts for city bus services were tendered since 1985 like the Gross Cost Contracts (1985 - 2000), Net Cost Contracts (1995 -1998) and Quality Incentive Contracts that is a variant of gross cost contracts (2000 onwards). Operators make bids based on the total cost of operating a route, including profit margins. Currently, all routes are tendered through the use of 5-year Quality Incentive Contracts where London Bus Limited (LBL) retains all fare revenues. The tendering process is a continual one, with 15-20% of routes tendered every year. In order to ensure that contracted private bus companies maintain desirable levels and quality of service, TfL undertakes a wide array of monitoring programs. The results of these monitoring programs are also used to determine the bonus payments and deductions based on the Quality Incentive Contracts. Currently, there are 23 companies providing bus services in Greater London. However, through mergers and acquisitions, 17 of these companies have been consolidated into 11 different entities providing bus services in London (5 bus operating groups and 6 single company groups).

The National, regional and local policies impact London's transport policies. The Department for Transport exists at the national level to lay down policies to enhance public transport usage and with a aim to promote sustainable transport modes. There is a white paper called Future of Transport White Paper that lays forth a long term strategy for sustainable transport for the next 20 years. In addition, the Planning Policy Guidance 13 on transport sets the policy on developing and planning new areas of transport. The Mayor's Transport Strategy operates at the regional level along with the London Plan which is a spatial plan and strategy with a vision

planning for next 20 years. Finally, at the local level, Borough's prepare their own transport policies in sync with the regional plans laid down in the Mayor's Transport Strategy.

3.4.2 Institutional Reforms

The prime responsibility of the transportation services is with the Mayor of London & Greater London Authority (GLA). The Mayor's office is responsible for drawing up policies for London related to all aspects like social, economic and environmental development in addition to the development of transportation. These cover all services that require whole city level planning. The TfL which is a body of the GLA manages transport in the London area and is responsible for implementing transport strategy of the Mayor of London as well as the transport related aspects of the London Plan. TfL is responsible for all modes of public transport in London (London buses, London Underground and Docklands Light Rail, and other smaller services), as well as other programs such as the Congestion Charge program, the Red Route network of priority London roads, and others. TfL has a board that is appointed by the Mayor of London. The income generated from the transport network is distributed in the ratio of 68% on daily operations and 32% on future development.

London Bus Services Limited famously known as "London Buses" is the unit within TfL responsible for managing bus services in London. From an administrative stand point it is a part of the Surface Transport Directorate of TfL, which is responsible for all above ground transport services (excepting rail networks). In terms of legal and corporate structure, London Buses is responsible for planning routes, determining levels of services, and monitoring bus services and also looks after the provision and maintenance of bus related infrastructure like bus stations and stops. Bus services themselves are conducted by private operators who are contracted to London Buses. In addition, London Buses Limited (LBL), previously in charge of the 13 bus operating companies that were privatized in 1994-95, continue to exist as a subsidiary of TfL, via the Transport Trading Limited holding company. An official watchdog organisation called London Travel Watch (LTW) also exists which represents the interests of users in and around London. A London Transport Users Committee has also been established in 2000 to redress grievances related to bus services in London, that which have not been resolved by the bus service providers. London Buses, by law have to work with LTW regarding bus services and related issues.

3.4.3 Regulatory Reforms

GLA was established as the municipal authority of London after the enactment of the Greater London Authority Act of 1999 which led to the creation of the Greater London Area. This Act was also responsible for the creation of TfL as a body under the GLA. As a subsidiary of TfL, London Buses is empowered by section 169 of the Act to contract with companies for providing public transport services. London Buses and TfL also comply with various other UK and EU regulations relating to access for disabled persons and fair competition laws. In addition, Bus Service Act 2017 was enacted to make provision for bus services and related purposes including advanced partnerships and schemes, registration services, ticketing schemes, registration of bus services and limitation of powers of bus companies in England.

3.4.4 Financing

Income and funding for city bus services is sourced from fares, congestion charges, grants from the Government and loans. Funding is primarily done from four main sources namely, fares income, other income, (including advertising income, property rental and income), grant funding and borrowings and cash movements.

3.4.5 Impact of PPP

Due to the quality of bus services, there has been an increase of 59% in passengers travelling by buses in London from 2000-01 to 2007-08. As compared to 1991-92, there has been an increase of 88% as compared to the year 2007-08.

4 Proposed PPP Ecosystem

Based on the study of the series of reforms held in case cities, it can be inferred that a sustainable eco system for PPP in urban bus system comprises five essential pillars as depicted in fig 3 below; namely, Policy framework, Institutional framework, Regulatory framework, Funding framework and Contracting framework.

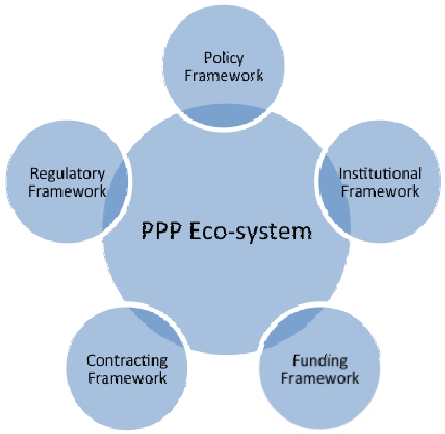

Fig. 3 Pillars of a PPP Ecosystem (Source: Developed by author)

4.1 Policy Framework

At the outset, cities formulated a Vision/Master Plan defining the goals to be achieved in a long term perspective for improving the urban transport system with public transport as key player. Moreover, as these vision/master plans had statutory support, it made them legally binding rather than a meager policy document. In line with the overall vision/master plan, cities developed "Strategic Plans" for public transport improvement and associated reforms. Such strategic plans included:

- Year on year network/fleet expansion plans
- Operational plans including infrastructure plans
- New strategies for integrating existing operators
- Business plans covering funding requirements
- Identification of funding sources
- Procurement strategies for PPP contracting
- Elaborate institutional frameworks

Similarly, all the case cities formulated/evolved a Fare Policy comprising of:

- Process for fare revision
- Independent institutional mechanism to regulate the fare policy
- Fare revision mechanism including cost components to be recovered from user fare
- Clearly stated Periods of fare revision
- Concessions for various socio-economic groups
- Assessment of affordability
- Fare structuring whether distance based or flat fare system
- Integration mechanism with other modes of transport
- Various products of fare like off-peak travel, etc
- Legislative support for fare policy

A comprehensive fare policy is a must for long term sustainability of private bus operation as gives confidence to the private operator as he is assured that, any escalation in his cost inputs are taken care by continuous fare revision in accordance with the commuter's affordability.

Each of the city thus had a "Champion" who lead from the front and pushed for the reforms towards achieving the overall vision/master plan.

4.2 Institutional Framework

Presence of a "Robust Public Institution" to deliver various functions related to policy, regulation, fare fixation, execution and monitoring, etc on the part of the public sector was a common key component in all case cities. While many functions like fare collection, housekeeping and Intelligent transport system, etc were delivered through outsourcing, the "Organization's Capacity" was developed by providing the requisite manpower to deliver core functions which comprised of:

- Operations and infrastructure planning
- Monitoring of the service quality parameters
- Contract management
- Public outreach and marketing

By outsourcing the service related functions and keeping core functions within the purview of the organization, it was ensured that size of the organization can be kept optimal and focus is kept on planning, monitoring and improving the services and also constantly addressing the commuters.

4.3 Funding Framework

Identification of sustainable funding sources for financing of capital cost and operational cost was a key strategy as seen in all case cities. It was understood that user fare through public bus systems would never be sufficient to ensure financial sustainability and hence other exclusive funding sources were identified like congestion charges in London, fuel taxes in Bogota, advertisement &commercial development in Singapore and London. It is also seen that in most of the case cities, initial capital investment towards development of infrastructure and procurement of buses was done by the Government from its budgetary sources or external borrowings. Despite a comprehensive fare policy, as user fares could not be kept within affordability, a subsidy mechanism comprising of deficit between the cost & revenue, towards concession offered to commuters from various socio-economic groups was also part of the funding framework. In Bogota, where the entire cost of operation was recovered from the passengers, a direct subsidy scheme was introduced for the passengers based on their socio-economic status. It was through this that they managed to keep the operators i.e. Transmilenio independent of any subsidy. Hence, a sustainable funding mechanism should include:

- Sources of funds from budget, borrowings, fuel cess, etc
- Identification of who will bear the cost of capital and replacement/expansion of the system
- Identification of who would fund the revenue deficit
- In case of revenue deficit, arrangements for subsidy transfer whether to the operator or directly to the user

Presence of a sustainable funding mechanism encourages the private sector participation and ensures returns on investments. At the same time, the executing authority can also maintain service quality by expanding the network/fleet size, replacing the assets, etc with an affordable fare.

4.4 Contractual Framework

A "comprehensive contractual framework" is considered as a backbone of PPP eco system. Salient features of the contractual framework are as follows:

- Risk allocation between private operator and public authority was to be in accordance with the capability to handle the same. While investment and responsibilities for creating infrastructure and capital risks i.e. towards depot, terminals, bus corridors and control centre was kept with public sector, private operator was held responsible for operational risks including ensuring service qualities.
- By ensuring operators payment based on distance travelled by buses and not on passenger transported, the operator was isolated from any ridership risk.
- Contracts included incentives and penalties linked with measurable service quality parameters. In case of London and Bogota, even the contract extension was dependent on the service quality of the existing operators.
- Contracts were kept flexible to deal with any unforeseen circumstances which were not anticipated during the inception of contract.

4.5 Regulatory Framework

Strong regulations were found to be overarching in case cities which provided statutory support to the all other reforms. Various institutions which were created for delivering their functions were empowered through regulations like the GLA Act, 1999 in London and PTC (amendment) Act, 2015 in Singapore. Special regulations were enacted to ensure overall development of public transport and to regulate the operators like the Bus Service Industry Act 2015 in Singapore and Bus Service Act 2017 in London. In Bogota, under the Colombian Law 86 of 1989, Article 14, it is required that public transport systems operate at self sufficient levels with fares set at " cost recovery" and that city government does not subsidize the system.

5 Conclusion and way forward

City bus services, in particular, occupy a key position in the list of urban services which are contracted out to private sector in search of a better and more efficient delivery mechanism as per global trends. However analysis of PPP application in urban bus service context in Indian cities reveal that while PPP is the way forward for sustainable delivery of city bus system there have been continued failures that question its applicability to Indian cities particularly due to absence of a requisite eco-system. The review of selected best practice global case studies in the present paper related to public private partnership suggest need for identifying various pre-requisite reforms before attempting the PPP in city bus system. The present paper proposes five major pillars , namely Policy framework, Institutional framework, Regulatory framework, Funding framework and Contracting framework as the pre- requisites for a sustainable eco system for PPP implementation with a higher probability of success in cities of developing countries like India. It is hoped that through developing measurable indicators for each of the above pillars .an evaluation tool could be prepared which could assist in evaluating the "degree of readiness/readiness index" for any city implementing the PPP in city bus operation. As a result cities will be able to take informed policy decisions regarding measures to be taken for improving the degree of success of PPP in urban bus services in their respective cities. In addition it can also be used by private operators to appraise them of the risk analysis to safeguard their potential business opportunities. It is expected that by combination of above cited utilities would enable creation of a positive eco system for PPP in delivery of urban bus services in Indian cities

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