Discussion Paper

Assisting Transition to Better Bus Transport Regulation in Select Countries

A Review of Key Design Elements and Select Cases

Honey Gupta*

Contents

This Discussion Paper has been prepared as part of the project entitled 'Competition Reforms in Key Markets for Enhancing Social & Economic Welfare in Developing Countries' (CREW Project, www.cuts-ccier.org/crew/). The project is being implemented in four countries: Ghana, India, Philippines and Zambia, and across two common sectors: Staple Food and Bus Transport with the support from DFID (United Kingdom) and BMZ (Germany) facilitated by GIZ (Germany).

CUTS International 2015, D-217, Bhaskar Marg, Bani Park, Jaipur 302016, India
Ph: 91.141.2282821, Fax: 91.141.2282485, Email: cuts@cuts.org, Web: www.cuts-international.org.

*Junior Fellow working with CUTS Institute for Regulation & Competition (CIRC). Inputs have been provided by Shreya Kaushik, Senior Programme Officer, CUTS International.

Background

This purpose of this paper is to act as a reference for policymakers and implementers to better understand the good practices in urban bus transport reforms. The need for developing this paper was felt in the Diagnostic Phase (Phase I) of the project under which this discussion paper has been made. The primary objective of the CREW project is to demonstrate the benefits of competition reforms for consumers and producers, so that greater attention and support is provided by the policymakers. With scarce resources, policymakers worldwide are faced with the challenge of deciding where to allocate the resources in a manner that will maximise the net welfare gains of the population. To aid in this process of allocating resources in an optimal manner, this research will demonstrate the gains of competitive markets to consumers and producers and fill the gap in knowledge that exists.

The preliminary research findings across four countries have been brought out through the Diagnostic Country Reports (*www.cuts-ccier.org/crew/Diagnostic_Country_Reports.htm*), and the project has entered the next phase of advocacy.

As an initiator for further work in the passenger transport sector, this Discussion paper attempts to record bus sector reform pathways adopted by select countries overtime. Without necessarily being recommendatory, this note aims to be able to help the CREW project countries – Ghana, Philippines and Zambia to better self-assess their present structure, direction, and preparedness, and absorb possible learning as they plan ahead. The idea is as much to review 'what worked' as it is to see 'what went wrong'.

DCRs and NAPs – Key Messages

The key findings of the DCRs and the consequent actions points as articulated in the advocacy plans for bus transport are summarised for each of the three focus countries:

Ghana

About the market: The bus transport in present Ghana, composed of three classes of vehicles – buses (large and small), minibuses and taxis, is subject to self-regulation by the transport unions. The buses and minibuses service the longer routes, while the minibuses and saloon cabs service the town centers and surrounding villages. The bus transport service (both inter-city and intra-city) is operated through both public and private service providers. There are no fixed service schedules, with coverage largely restricted to high demand routes.

Ownership - Asset Control	Contracting	Routes	Fare Setting
– **Unions (Pvt. Buses) – >70 percent passenger traffic** – **Metro Mass Transit (Govt. owned and subsidised) – less than five percent traffic**	While the legislation (LI 2180 of 2012) provides for pro-competitive elements (allocation of bus routes to be based on needs on the ground and route franchising through competitive tendering process) - the regulation is weak and compliance poor	The transport unions exercise considerable dominance in deciding the routes (profitable) that operators should serve; accessibility of bus transport to commuters staying in remote areas is therefore big concern	No fare setting - there are no set fares for the bus services (except the MMT), thus leaving a lot to the bargaining power of the consumer

A regulatory body to ensure bus availability, standard fares, safety and above all to regulate the dominance of transport unions in Ghana is being strongly considered – European Union is drafting the 'Road Transport Authority' (RTA) for Ghana.

Zambia

About the market: The bus market in Zambia is characterised by low quality second hand buses manned by unprofessional staff, high load factor (passenger km/seat km) and uncomfortable ride. There is general dissatisfaction among the consumers (about 70 percent) who perceive fares as too high for the quality of service provided. CREW project estimates that commuters spend on average about 8.6 percent of their income on transport. There is little incentive for a private operator to invest in quality.

Ownership-Asset Control	Contracting	Routes	Fare Setting
Privately owned and operated (Deregulated market)	– Once an operator is licensed to operate in intra-city bus transport, the operator is free to choose a route that is lucrative, even for the day – Issues of access to buses for commuting needs on non-profitable routes.	– No route allocation framework* – Operators are licensed according to intra-city and inter-city routes, and can operate anywhere within intra-city and inter-city	– Consumers are generally (80 percent) dissatisfied 80 percent of the respondents indicating that the price change (increase) over the last 5 years has been undesirable – fares constitute a significant portion of the income of intra-city users

** Local authorities in Lusaka are considering applying a route allocation policy to enhance the quality of passenger transport.*

The Philippines

About the market: The bus transport sector in Philippines has evolved from a highly regulated and concentrated market in the 1970s to a liberalised market composed primarily of small operators. The market now operates under a highly complicated regime where regulation and enforcement is shared by several agencies resulting in implementation failures. Current bus market is beset with corruption, illegal and undisciplined operations, excess capacity and weak regulation enforcement.

One of the main problems is the presence of a large number of buses (and other vehicles) in Metro Manila leading to cut throat competition and affecting consumers' mobility within Metro Manila (huge time delays due to congestion). There exist 1,122 operators and 12,595 buses operating in Metro Manila. Further, the oversupply is especially problematic in the peak hours, as is evident from low/moderate seat occupancy by commuters. Decongestion measures – Route Rationalisation, and the Moratorium introduced in 2003 have not been effective.

Ownership - Asset Control	Contracting	Routes	Fare Setting
Privately owned and operated (Deregulated market)	– Franchise system (a Certificate of Public Convenience (CPC) or description of the route and service area and is	– Monopolised routes: each route is required to have a min of 2 operators – Development Route:	Government regulates bus fares for both AC and ordinary non-AC buses. Two factors

	valid for 5 years and can be renewed up to three times – Boundary system of compensation (driver earns based on how well he competed with other bus drivers for passengers) within franchised routes - majorly contributed to road indiscipline – More recently, part-fixed-part-performance based compensation is enjoined	Operator can develop a new unserved route, provided exclusive rights for two years	are considered in fare determination: public acceptability and financial viability for operators. A fare schedule (minimum and per-km fare) is set by the LTFRB after a mandated public hearing

The DCR estimates that a reduction of up to 20 percent of buses in Metro Manila would not only improve commuter's mobility but also save unnecessary costs.

Articulating the Need

The current urban bus operations in the three countries present weak governance and varying institutional capacities, perhaps closely related to their level of economic development. While they have experimented with certain reforms over the years, the bus transport markets still exhibit severe regulatory challenges that currently prevent optimal consumer-producer welfare gains. Table below tries to briefly articulate the needed improvements or regulatory goals identified for the bus transport markets across the discussed countries:

GHANA

- **Institutionalising Route planning and Fare setting mechanism**
- **Enhancing bus availability for consumers in Ghana and equitable distribution of bus service within the cities**
- **Speed up the establishment of Road Transport Authority**

ZAMBIA

- **Review of the regulatory framework and institutional settings of RTSA**
- **Review of the 'fare setting' process in bus transport**
- **Route rationalisation**
- **Standards to make the bus service comfortable and safe for the commuters**

THE PHILIPPINES

- **Strengthening enforcement mechanisms**
- **Rational fare setting, as a measure to regulate competition**
- **Reduce excess bus capacity – consider both supply side and demand side reforms**
- **Strict implementation of the existing policies such as the 'age' limit of buses as well as moratorium on the release of new licenses**
- **Reforming the bus sector entails either legislation (executive order or a law) or reformation within the Land Transport Franchising and Regulatory Board (LTFRB)**

Bus Transport System: Typical Elements

A wide variety of bus management strategies are adopted in third world cities, many of them aimed at accommodating the highest volume of demand, at whatever level of quality can be afforded by users. The level of service quality that can be afforded by users is often very low in developing countries. While we review the transition of bus transport regulations in specific countries in the subsequent section, some broad thinking and key components for a typical bus system are discussed here.

It all starts with a public policy objective: A basic policy objective for public transport is that an operating environment is created within which a service is provided that meets demand from users. More specifically, key objectives[1] for any city are likely to be:

- Efficiency and effectiveness – resources need to be used efficiently to maximise benefits and the services need to be designed to meet the city's transport needs effectively
- Societal needs for mobility – providing basic mobility for all citizens, and this may require particular service provision, service quality, fares levels, structures and concessions, and co-ordination and integration with the city's wider policies and plans
- Affordability – transport solutions should be affordable within a city's budgets and the fares charged affordable by the key user groups
- Safety and environment – a fundamental requirement will be safe and environmentally responsible operations

The regulatory strategy, market type and access to the market together define the typology of regulation. Various market structures and associated regulatory regimes exist in the bus sector.

Classification	Degree of Competition	Characteristics
Monopoly	No Competition	**Administered Public Supply –** Responsibility for providing transport services is vested in a single operating undertaking either a private company or more commonly a public sector agency which plans and directly operates the services India has largely exhibited public monopoly in bus transport; reforms (Bangalore etc.) towards controlled competition have now begun

[1] Advancing Urban Passenger Transport Reform in the Europe and Central Asia Region, Reforms Option Report, Dec 2003

Management contracting **Service Contracting** ▪ **Gross cost service contracting** ▪ **Net cost service contracting**	Controlled Competition (the 'middle ground' between monopoly and an open market): - **Competition *FOR the market***	**Regulated Market Model** – The city sets out its requirements from the market and encourages operators to compete for the right to provide services in line with the requirements. These operators may be exclusively in the private sector or a mix of public and private sector operators. Operators are granted rights to operate by the city, normally assured of protection from external competition 'on-the-road' Example: Seoul
Open Market	Open Competition - ***Competition IN the market***	**The Free Market Model** – Ownership, control and operation is entirely within the private sector in the most extreme examples of this model. On-street competition between operators and companies is allowed and indeed encouraged. The full innovation and expertise of the private sector is engaged, but there is very limited if any scope for the city to influence outcomes. Regulation is limited to safety, environmental and as appropriate a city or government's monopoly and competition regulations. **The most well-documented example is in the UK cities outside London**

Between the two extremes of public monopoly and deregulation lie a variety of hybrid models which can be described as utilising a 'Competition for the Market' approach. This *Controlled /Regulated competition* approach balances public sector control of policy and service planning decisions with the active involvement of the private sector. While there is some loss of direct influence, this is likely to be more than compensated by the increased effectiveness and efficiency provided due to the competitive processes.

Wherever competitive conditions can be established in the transport market, services should be operated on a commercial basis by the private sector. On the other hand, economic and fiscal policies should determine the proportion of the costs to be borne by users associated with their use of transport, subject to affordability considerations for low income groups.

Competition can yield benefits. Normally, the key element of reform is the introduction of **competition**. Incentives provided by competition are generally regarded to be more effective in promoting efficiency and demand-responsiveness in transport services than directives or direct provision of services by state agencies. However, as noted by Urban Public Transport Competition Final Report, Halcrow Fox for Department for International Development, UK. May 2000:

- Competition can bring large benefits if appropriately (not necessarily heavily) regulated
- Regulation is not without risks – it is expensive and if applied inappropriately can stifle innovation in the supply of services and competition
- There is no optimum regulatory regime. None is perfect. The most appropriate strategy should be selected and adjusted to contextual factors:
  - geographic, demographic and socio-economic characteristics;
  - public transport policy and pricing objectives;
  - institutional capacity;

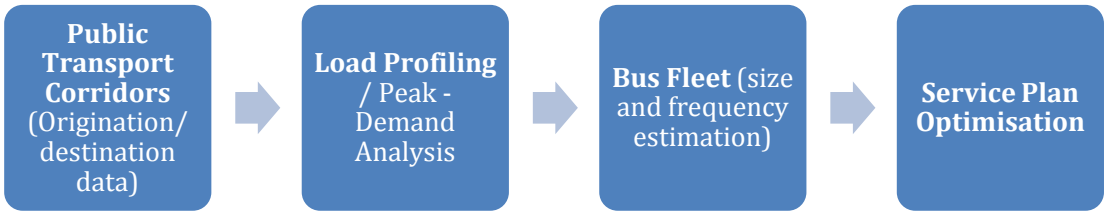
- the industry structure;
- the types and modes of transport in the area.

As listed in the table above, Competition in bus transport can take two forms:

"**On** the Road" competition, also called "Competition **in the Market**"	"**Regulated**" competition, also called "Competition **for the Market**"
•"On-the-road" competition allows operators to compete directly with each other for customers, with or without restrictions. •This is the closest that public transport comes to a totally open market, which is rare	•"Regulated" or "off-the-road" competition is the strongest emerging trend, and allows operators to bid for the contract or franchise for specified operating services. •The winning bidder usually enters a contract and is given protected or exclusive rights for the service provision •Most developed cities of, EU including London, Australia, New Zealand and US exercise controlled competition for the market, i.e. the competition is for the right to operate

While the role played by the supervisory or regulatory authority will vary between the three models, (no competition; controlled competition and open competition) but an effective body is necessary for any of the models to be successful. Among others, the capacity to undertake route planning, fare setting mechanism and decision on contracting structures will be important.

Route Network Planning is Critical. At a more micro-level, planning for the bus transport system invariably involves route identification based on demand assessment and development of a service plan. Bus route and service planning need not be sophisticated or require large resources, but it should be progressive, systematic and realistic. For network planning, detailed passenger origin/destination data is necessary which will then be used to assess passenger demand and distribution and then to identify trunk and feeder routes. The task of identification of public transport corridors and mobility data will be usually less intense for cities with existing public transport than those without. A broad schematic of route planning exercise is placed below.



For a more practical assessment of route planning exercise involving load profiling, bus fleet and frequency estimation; please refer '*Bus Karo: A Guidebook on Bus Planning & Operations*' available at http://embarqindia.org/bus-karo

Regulation is necessary to ensure that services are provided on commercially unviable routes, and at times when a service is necessary for social reasons but which the market finds unprofitable to operate. This may be achieved by clubbing with profitable routes, providing subsidy, running smaller buses or by public bus services.

Fare Policy - need to balance both commercial and social interests. Fare policy and regulation is clearly the most politically sensitive issue in the passenger transport sector and, when poorly designed or applied, can have severe implications for the market and the service quality.

Fare regulation is an integral component of a regulated passenger transport regime, but fares are often set for political or social objectives rather than to ensure the commercial viability of the operator(s). In many instances, a degree of cross-subsidy within the network, where the passengers on high-demand corridors effectively support those in peripheral areas is common. Where fares are set too low to allow full cost recovery, the operators are exposed to major risk, and the result is usually a deterioration and reduction of services. Operators will normally find undesirable ways of subverting these in order to survive. For example, when a fare ceiling is set, operators may cut short their routes to the extent that the fare is then sufficient to cover their costs. If keeping fares low on formal bus services results in reductions in service coverage, it's often counterproductive as the poor may no longer have a usable bus service and may be forced to use informal transport at much higher fares.[2]

Public transport policy must necessarily address the issue of whether the full cost of providing a bus service should be recovered from passenger fares or would general or cross-subsidy be allowed to bridge the viability gap. The provision of subsidy is a distinguishing factor between developed and developing urban bus systems. In a developed city, the authority is responsible for the difference between revenue and operating costs and for the financial consequences of its decision on fares. In contrast, the financial consequences of fare decisions fall on the operator in an unsubsidised system.

In a regime of controlled competition, fare control is usually, but not always applied. Where fare controls are in place, the tender award criteria will include the highest bid made (or the lowest subsidy required) for the right to operate the specified service. Where there are no fare controls, the award criteria may be the lowest level of fares proposed for the service.

In a fully deregulated regime, there are no fare controls. In practice though, the authority may still try to manipulate fares either directly or indirectly. The latter is sometimes achieved by the support of a formal service provider, perhaps a public sector operator, who then applies a downward pressure on fares in a competitive market

Fare Setting[3]: Involves two important considerations –

a. **Fare structure -** Fare structure refers to the types of fares charged, the most common of which are:
   - Flat fare - same fare irrespective of distance travelled on a particular route
   - Graduated fare - fare increases with distance travelled on a particular route, often increasing at a decreasing (telescopic) rate
   - Zonal fare - fare increases with journey distance according to fare bands and is usually independent of number of bus routes used, i.e. free transfers, and

[2] Urban Bus Toolkit: Tools and Options for reforming urban bus systems, the World Bank and PPIAF
[3] *Ibid*

also usually independent of mode of travel selected if bus and rail are both available

b. Fare level - Fare level refers to the average fare paid per passenger (or per passenger-kilometer) for the whole system. Raising or lowering this average level changes the total income of the bus system. For example, if fare income is expected to drop to 90 percent of total costs in the coming year due to general inflation, and the target is 100 percent cost recovery, the fare level will have to rise by about 15 percent (assuming no loss in passengers as a result of the higher fares) to achieve this. How this must be done in line with the social objectives of the fares policy and the agreed fares structure. A bus system's role in social service provision is another important element in setting fares.[4]

Contracting will tie all of this together. A contract is primary reference document laying down conditions that form the basis of the business agreement between the city authority and the service provider. It records the responsibilities and obligations on each party. It identifies the services, standards to be provided and the associated rewards/penalties.

The Contract will typically consist of two main sections:

1) The Standard Conditions of Contract common to all transport service contracts
2) The Schedules applicable to the specific Contract to be signed

Contract Schedules typically form the major part of the documentation. They include among other things:

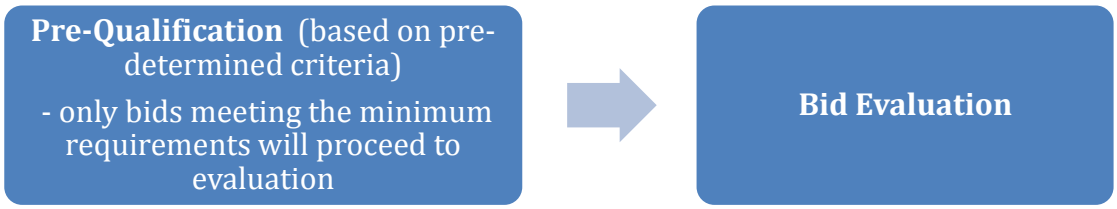
- A full description of the routes, timetables, stopping places, interchange points
- A full listing of all tariffs to be applied, concessions to be accepted
- Operations and customer support requirements
- Performance indicators and quality measures and target levels
- Vehicle specifications
- Information/periodic reports to be provided to the Transport Authority
- The payment basis, amounts and means of calculation, and basis for deduction
- The basis and details for incentive regimes
- Health, safety, and environmental obligations

Competitive Bidding – as means of Procurement

Competition 'for the market' usually involves the authority specifying the services and infrastructure to be provided, and then inviting potential operators to make proposals against those specifications. The bidder offering the bid that best meets the selection criteria wins the tender. The pre-qualification stage is to determine whether a bidder meets the minimum requirements to operate a bus service safely, efficiently and reliably. Criteria will usually include the bidder's experience in transport, qualified staff strength and financial resources in relation to the scale and complexity of the operation. If the bidder pre-qualifies the minimum standard for each parameter, the bid will proceed to the evaluation stage.

[4] Supra Note 2

An outline of tender procedure is shown here:



***Different* formats of contracts are used** to procure bus services from private companies. These formats differ essentially on two accounts:

What 'unit of system'[5] is contracted out	How is operator compensated for the services
Area Contract **Exclusive right to provide services on all bus routes in a given area of the city or urban agglomeration**	**Net Cost** Operator gets the right to collect fares from the service users; does not receive compensation from the authority. Operators in turn may pay the authority a fixed sum (or royalty) on a per bus basis agreed at the time of contract signing
Route Contract **Right to provide all services on a specified route**	**Gross Cost** All revenue accrues to the transport authority who then pays an annual fixed sum to the Operator for the production of services
Remarks **A contract may govern the operation of a single route; or it may confer an exclusive right to provide all transport services in an area of the city, subject to limited rights of access by other operators for operational convenience. The authority may 'bundle' single route contracts to create a de facto exclusive area franchise. Some of the key advantages of an Area Contract may only be realised if the operator has an incentive to increase bus patronage, i.e. the contract is on a fully commercial, or a net cost basis**	***Remarks*** Gross and Net Cost contracting represent different allocation of revenue risk among the Transport Authority and the Operator. Net Cost contracts usually allocate some right of initiative to the operator

A major advantage of a single contract covering an area is that it enables transfer of responsibility for planning and designing the route network from the authority to the operator, considerably reducing the authority's workload. Further, an area operator (especially operating under a net cost contract or on a fully commercial, unsubsidised basis) is likely to be sensitive to demand and thus more likely to produce a service well fitted to demand than the plans produced by the authority under a system of multiple route contracts.

The formula for the payment should be clearly defined in the Contract, including the method of calculation, exceptions, and default.

[5] Bus Karo: A Guidebook on Bus Planning & Operations, EMBARQ

***Revenue* Sharing Agreements** - Within both Gross and Net Cost Contracts, the Contract often contains "Revenue Sharing Agreements" which are activated if there is a significant uplift in the revenue. Revenue Sharing agreements will usually define the reference revenue levels, the threshold increase values at which revenue is shared, and the percentage or value to be shared.

Gross Cost Contract	Net Cost Contract	
Transport Authority or an external entity could initiate some change that leads to increased patronage and revenue. The revenue sharing agreement will ensure that that Operator receives some reward for additional people it transports.	Transport authority or external entity could initiate some change that leads to increased patronage and revenue. However, most of the revenue will accrue to the Operator as windfall gains. The transport authority will naturally seek to recover part (usually more than half) of these gains.	Operator could bring innovations that lead to increased patronage and revenue. While the effort has been made by the Operator, the Transport Authority considers that it has been able to do so because of the franchise it was awarded, and therefore they should receive some of the gains (usually less than half).

***Specification* of the service quality is one of the most important parts of the contract**. It must be supported by practical monitoring and intervention mechanisms. A dedicated Service Quality Schedule needs to describe the parameters that are relevant to the contract. Equally importantly, the target values (that will trigger bonuses, penalties, interventions, contract termination) need to be clearly defined.

In order to provide greater incentives for operators to provide better quality services, London Buses has developed Quality Incentive Contracts (QIC).[6] Operators are paid for the quality of service they deliver as well as volume. The main features are as follows:

- Bonus payments will be made for performance above target, deductions will be made if targets are not achieved.
- Contract extensions of two years will also be available if performance is above the set standard.
- The current system of deductions for lost mileage is retained
- Fare revenue will be retained by London Buses to fund incentive payments and for investment in the network.
- The major measure of quality will be 'Reliability' as this is of most importance to passengers.
- 'Softer' customer satisfaction measures reflecting the passengers' whole experience of the journey will also be taken into account, and will affect the contract extension provision.

The resources employed in bus services should be put to the most productive and efficient use. For this, there is a need to evaluate the operational performance of bus services and the standard of service being provided to users. Commonly monitored indicators are:

Operational Performance	Service Quality
Passenger volume – no. of passengers per operating bus per day	**Waiting Time –** time passengers have to wait for buses
Fleet utilisation – proportion of a bus	**Walking distance to bus routes** –

[6] Case Studies – Urban Bus Toolkit

fleet in service each day indicates the effectiveness of bus procurement, maintenance, and staff availability. Utilisation above 80-85 percent should be acceptable	indicates network coverage by bus routes (300 to 500 m is acceptable based on area density, should not typically exceed 1 km)
Vehicle Kilometers – average km per operating bus per day	**Journey time** – should relate well to expected average bus speed
Breakdowns – proportion of buses that break down in service is an indicator of vehicle age and type maintenance and driving standards	**Interchanges** – adds to time, cost and inconvenience; the lesser the better. Rail-to-rail interchange is perceived to be less arduous than interchange to or from buses
Fuel consumption – function of bus size, load, fuel, traffic conditions; also driving and maintenance	**Travel expenditure** – of particular significance to low-income groups in their mode-choice behavior
Staff ratios – admin and operating staff per bus indicates management efficiency	
Accidents	
Dead Kilometers – km run without revenue passengers	
Operating cost - dependent largely on labour and fuel cost but also on efficiency of operation and traffic management	
Operating ratio – total revenue divided by operating costs including depreciation. Around 1.05-1.08 is expected.	

The discussion above tries to put in perspective the broad elements of an urban bus system that the planners, officials and policy makers should be aware of. The elements discussed are certainly not exhaustive (relevant infrastructure requirements, vehicle standards etc. have not been covered), limited essentially by the project focus. Other more comprehensive resources such as 'Bus Karo: A Guidebook on Bus Planning & Operations by EMBARQ' and the Urban Bus Toolkit by World Bank and PPIAF may be referred for more detailed account.

The subsequent section takes a look at bus transport reform pathways traversed by certain economies overtime to take home possible lessons for the CREW project countries.

Bus Transport Regulatory Transition – Select Cases

There is a strong international trend for reform in the organisation of passenger transport. In the past two decades, **almost all developed and developing countries have experimented with different forms of ownership and regulation of bus transport**. This is motivated by individual factors. Within developed countries, the reforms are expected to address issues of inefficiency and lack of motivation for change and innovation in the services. By contrast, in developing countries, the public sector has often lacked either the capability or the financial resources to meet the mobility needs of the citizens. They often face serious crises in passenger transport and need radically different solutions that are both effective and affordable.

Reform aims for better efficiency, better value-for-money, and better quality. It provides the structure and the motivation for both planners and providers of passenger transport to improve cost and performance. It achieves this by introducing competition, and by making all aspects of the process transparent and subject to market forces.

Improved public regulation in bus transport for the three CREW project countries might require calibrated approaches, which may benefit from experience of reform pathways adopted by others over the years. Instead of just noting good practices and risk suggesting a 'one size fits all', a record of the transition of select cities/economies is made as they attempted regulatory reforms in the bus transport market.

Seoul - Deregulation to Controlled (franchised bus) Competition

The bus system in Seoul was mostly deregulated prior to reforms in 2004. The first public bus services in Seoul began in 1953 and remained the principal mode of public transport until the mid-1990s. Bus usage rose rapidly with the growth of Seoul in the 1960s, 1970s, and early 1980s, but began a long-term decline around 1985. Seoul is selected here as it is recognised as a successful case study of enhancing franchised bus services through implementing traffic management measures such as bus route rationalisation and improvement of transport infrastructure facilities and management systems. The Seoul Metropolitan Government (SMG) overhauled its bus transport system in 2004.

Back then:

- The SMG had very little control over the system apart from setting fare levels. It played no role in route network or system planning.
- Bus services were not popular with travelling public due to infrequent services and long/circuitous route
- Private bus companies were allowed to provide services on any routes they deemed commercially viable, subject to obtaining an easily available licence from the public authority.
- Since there was no regulator or an oversight body for of the bus network, the system was highly inefficient and disorganised, low service levels in some areas and excessive supply in others.

The reform timeline

Timeline	Drivers of Reform	Reform	Output
2004	• Financial crisis of Seoul public transport system • Increased car ownership, traffic congestion, air pollution These led to: • Public transport planning studies • Consultation	**Bus Route Rationalisation**	• Entire redesign of the city's bus route network to better structure and integrate more than 400 different bus routes • Under the new design, bus services are grouped into four types and color-coded to make them easily distinguishable
2004-05		**Transport infrastructure and system improvement**	• More transit interchanges to facilitate smooth transfers and reduce need for long haul point-to-point bus routes • Exclusive bus lanes in centre of busy street • Bus Management System – GPS based real time information to passengers, on-time service, optimal service distribution based on travel demands

	with the academics, district representatives and the public • Development of reform strategy		• Transport Operation and Information Service (TOPIS) - computerised system coordinates roadway traffic as well as public transit vehicles, thus permitting the optimisation of traffic signals to speed up buses
2004-05		**Introduction of distance-based Fare charging system**	• Introduced a unified, coordinated fare structure that integrates both bus and rail services • Fares are based only on distance traveled, with free transfers between bus lines and metro • Multipurpose stored-value smart card (T-Money) that can be used for all bus and rail services

Reform experience/impacts

- In the first month of the reforms, there was tremendous disruption, confusion, public discontent, and political uproar. Much smoother transition could have been ensured with more time and effort in distributing the appropriate information to the public before implementing the reforms.
- By October 2004, almost 90 percent[8] of Seoul residents expressed general satisfaction with the restructured bus services and new fare system.
- Average bus speeds increased by 33 to 100 percent [9] in the BRT corridors.
- Total bus accidents and injuries on all routes combined (express and local) have fallen by about a third
- Introduction of distance-based fare charging system resulted in commuters paying about 30 percent less[10] on average for using public transportation service

UK (outside London) – Public Ownership to Deregulation

Cities in UK outside London come closest to this situation under the deregulated bus transport regime. Private bus companies were common in Great Britain in the first half of the 20th century. The public transport industry was nationalised in the late 1940's.

- Until the reforms of the 1980's that introduced deregulation outside London, and tendered contracts in London, the UK bus industry comprised state or municipal monopolies.
- Buses outside London were operated by municipal corporations in the larger cities, and by two state-owned holding companies elsewhere.
- Public ownership and growing public subsidies were not very successful in arresting the decline in bus ridership.
- Efforts at privatisation were usually limited to contracting out operating functions such as maintenance, etc.

In one of the most dramatic and ambitious efforts ever undertaken to privatise public services, the British Transport Act of 1985 ordered the de-regulation and privatisation of bus services throughout Great Britain exempting only the Greater London metropolitan area (which followed a different model). However, a substantial

[8] *Public Transport Reforms in Seoul: Innovations Motivated by Funding Crisis John Pucher, Hyungyong Park, and Mook Han Kim, Rutgers University Jumin Song, University of Michigan*
[9] *Ibid*
[10] *Ibid*

proportion of bus mileage is subsidised under service contracts and there are public transport authorities in each of the major urban conurbations.

The reform timeline

Timeline	Drivers of Reform	Reform	Output
1930	To exercise control	**Road Traffic Act 1930**	State or Municipal Monopolies Publicly owned transport Companies
1984	A white paper on Bus transport by Department of Transport that argued against • Excessively high cost due to regulations • Lack of innovation • Structure of internal cross-subsidy which was both inequitable and inefficient	**British Transport Act of 1985** Deregulation meant - • Abolition of the quality controls provided by the Road Traffic Act of 1930 • Privatisation of the National Bus Company and reconstitution of municipally owned companies and • Subsidy reduction	Local bus services in Britain (excluding London) were deregulated in October 1986 Local bus services are provided by private operators as either: • Commercial services (no subsidy) or • Supported (regulated) services subsidised by the Local Transport Authorities (LTAs) for commercially unviable but socially important routes
1986	Procurement of services	**Competitive Tendering**	Route contracts, mostly small, most Net Cost basis, up to 5 years
2000	To strengthen powers of LTAs.	**2000 Transport Act**	• LTAs are empowered to require bus operators to meet certain quality standards based on Quality Partnership Scheme (QPSs) and Quality Contract Schemes (QCSs) • Also allows LTAs to set up ticketing scheme for better integration
2008	Further strengthening and certain changes	**Local Transport Act 2008**	Increase in regulatory powers of LTAs

Reform experience/impacts

- The Transport Act created a competitive free market in the UK for the local (outside London), suburban-country and long-distance bus services
- Post deregulation, fierce competition began among small bus operators. Also a consolidation trend began leading to the creation of several large operating groups with subsidiaries in different areas.
- One of the principal arguments for deregulating the British bus industry outside of London was that the competitive market forces that it brought with it would reduce costs, particularly due to higher productivity and lower wage.
- However, following local bus service deregulation in 1986, bus vehicle kilometers increased but passenger journeys fell and bus fares increased in real terms.

- Between 1985-86 and 1996-97 bus fares increased in real terms by an average of 24 percent, and passenger journeys fell by 31 percent (excluding London). One possible reason was perhaps subsidy reduction due to government macro-economic policy.[11]
- Competition in long-distance public transport sector also commenced after deregulation. This primarily took place on the popular and economically attractive routes with price competition as the main lever, leading to a reduction in fares.[12] Further, features included the use of innovative price formation, the introduction of rapid and express services, and an increase in the frequency of services, the utilisation of opportunities provided by the new motorway system.
- The main administrative task, through the registration system, was to closely follow the development of the services and to ensure that socially necessary, but economically nonviable, routes are also provided.
- An estimated about 500 operators, both supported and commercial, provide local bus services in Great Britain. Of these operators, there are nine major bus-operating groups with four large national groups.
- The four national bus-operating groups occupy about 67 percent of the bus fleet in deregulated market
- While the results today are mixed with less than satisfactory quality of services, the most distinctive lesson for developing countries from the British experience is the importance of innovations in service provision that was most likely stimulated by privatisation.[13]

Sri Lanka – Monopoly to Regulated Bus Transport Market

Sri Lanka saw periods of distinctively different bus transport service provision in terms of ownership, management and regulatory structures during the past 100 years with the current one of regulated mixed competition beginning in 1979. Motorised road transport began in Sri Lanka at the turn of the 20th century with road transport becoming popular after the Second World War replacing railways as the primary mode of travel.

11 Bus Service Industry in Britain, (http://www.lawteacher.net/free-law-essays/transportation-law/bus-service-industry-in-britain.php)

12 Public Road (Passenger) Transport Regulations in India, CUTS Institute for Regulation & Competition, Working Paper, 2013, S Sriraman

13 *Ibid*

The reform timeline

Timeline	Drivers of Reform	Reform	Output
1958	Nationalisation of bus operations	**Ceylon Transport Board**	Monopoly was created to operate all bus services
1979	To enhance bus transport capacity through competition	• **Introduced Individual private minibuses** • **District based operators' associations were given significant regulatory powers**	• Govt. ended the Central Transport Board's 20 year state monopoly on bus transport • Allowed unrestricted competition with conventional buses on high density corridors • Rapid growth of private minibuses • The private minibus operators charged the same or less than the conventional bus fare
1991	• To Develop National Policy for Bus Transport • To provide for financial support for certain passenger transport services	**National Transport Commission Act**	To advise the government on national policy relating to passenger transportation by omnibus
2000	• Under-investment by Corporates • Overloading and only public services on low demand routes	**Fare Rationalisation - bus fares were based on an index of bus input costs, with base-line of 2001**	• Provided strong influence on the date and scale of revisions • There were significant challenges in actually applying the costs based on the formula
2005		**Incorporation of Sri Lanka Transport Board (SLTB)[14]**	11 Regional State Public owned and operated bus companies were reformed into a single entity (SLTB)

Reform experience/impacts

- The unplanned and rapid growth between 1979 and 1983 led to many owner driven buses entering the industry.
- Operators selected their own vehicles, route frequencies and hours of operation. Competition led to crush loads, excessive speeds, congestion in the central area and safety violations
- Even though the National Transport Commission Act of 1991 provided for specific regulatory instruments, the National Transport Commission did not

[14] Urban Bus Services in Developing Countries and Countries in Transition: A Framework for Regulatory and Institutional Developments, Brendan Finn, ETTS Ltd Corinne Mulley, University of Sydney, 2011

develop all these regulatory measures and saw its role mostly as an issuing office for route permits.

- While the private sector fleet increased rapidly but saw declining reliability and productivity. Moreover, private sector entry fragmented the integration of the bus network as they operated only where and when it was profitable to do so.
- Due to weak regulatory structure, the fare rationalisation reform in 2000 witnessed challenges in actual fare application and failed to meet intended objectives of boosting private investment or reduction in subsidy etc.
- The essential cause of poor service accessibility on low demand routes was a combination of sole reliance on the public sector to provide subsidised services and the decline of its capability to perform that function.
- Competitive tendering of subsidised services to allow the private sector to supplement the public sector supply was not used. This was perhaps due to weak regulatory capacity.
- Emphasis on revenue generation instead of sector development has been identified as major concerns why regulators have not fulfilled their roles justifiably.

Chile – From Regulation to Deregulation to Measured Regulation

Chile Bus transport has traversed much of the regulatory spectrum, from substantial public regulation to large-scale deregulation, and lately working back to regain control. The operation of public transport services in Chile has always been a predominantly private activity, with the State being a regulator than a provider. The state was also a transport provider during 1960s but even at its peak it served less than 20 percent[15] of the demand. With the prime aim to relieve the government of excess financial burden, the urban bus transport in Chile was deregulated in 1980s. This meant lifting of most regulatory controls, such as the setting of fares, or limiting the number of operators serving a specific corridor. It was believed that the decontrol would improve allocation of resources and the services would benefit from increased competition. However, the results were mixed sloping more on the negative side. Beginning 1990s, there has been a conscious effort by the govt. to bring about some control and undo many of the undesirable outcomes that resulted from bus market deregulation.

The reform timeline

Timeline	Drivers of Reform	Reform	Output
1979-80	To reduce government spending	**Deregulation of Public Transport**	• Reduced unit costs • Increase in the number of services on the most profitable routes • Deterioration in system wide planning

[15] Study of Urban Public Transport Conditions in Santiago, Chile 1990-2005, Urban Bus Toolkit - PPIAF

Timeline	Drivers of Reform	Reform	Output
1991 onwards	Poor service quality, heavy congestion and ad hoc planning	• **Fleet reduction measures** • **Min quality of service standards** • **Bidding process to allocate routes** • **Formula based user fare**	Compliance and the productivity remained low due to weak regulatory structure
1993-2000	High Level of air pollution	**Environmental emergency network – car use restriction and bus priority measures**	• Increased public transport speeds • Reduction in pollution
2000-2006	• Election of President Ricardo Lagos in 2000 • Plan to recover the regulation of transport services	**A professional group organised to prepare technical basis for a transport plan and apply emerging transport concepts**	• The Plan released in 2000 considering integrated planning, reduction in average trip length, reduced emissions, better traffic flow, car user restrictions etc. • Violent opposition by traditional transit providers in 2002
2006-2010	To regain control and bring market discipline	**Transantiago[16] -a city wide public transport modernisation plan, started full scale operation in 2007**	• High productivity per bus per Km • More involved planning and service standarisation • Longer walking for users to access designated stops • Insufficient infrastructure led to higher dwell time

Reform experience/impacts

- Regulation was comprehensive until the 1980s, and included determining routes and fares as well as assisting private operators in buying buses through soft credits.
- The winding up of the state-run bus company started in 1975, allowing it to collapse over a period of four years, when most regulatory controls were removed.
- The entry to the sector was effectively deregulated in November 1979, by an order of the Transport and Telecommunications Ministry providing for free entry of private operators into the sector.
- With deregulated public transport 1982 onwards, no previous permission from the state was required to operate, and no entrance barriers other than the need to comply with vehicle inspection regulations. Each operator established its own route and fares and could change them at will, without necessarily informing the authority about modifications made. However, the trade unions did administer the agreements with operators on tariffs.

[16] Include bus route and service optimisation, fare integration, fleet renovation, and support infrastructure for buses. Open, competitive bid process to award concessions (Bus operations) with flexibility to introduce changes – Case Study of Transantiago, Santiago, Chile

- While the reforms did have positive effect on govt. finances and the services improved on high demand routes, the negatives far outweighed the benefits. The unit costs reduced but the real fares saw a significant increase of about 10 percent per annum. The deregulated services altered the routes so as to pass through the central areas with high travel demand resulting in an oversupply of public transport. Heavy congestion particularly led to decline in air quality conditions.
- There was cut throat competition 'in-the-market' and the system wide service planning suffered. The ratio of cost to value of service received increased for most users during the period 1980 to 1987.[17]
- Owing to huge public dissatisfaction with service quality, efforts to re-regulate the services began during 1990-92 after almost ten years (1980-89) of complete deregulation of bus transport in Chile
- The maximum age for public transport buses operating in Santiago was set by decree at 10 years. This eliminated about 3000 old buses.
- A new law allowing government to franchise public transport services through a tender process was implemented in 1991,[18] despite attempts by bus operators to prevent it. Tendering helped regulate supply levels and standardise service features.
- In a more systematic push for reforms, the govt. initiated the Urban Transport Plan for Santiago 2000-2010.
- While there are infrastructure issues, public resentment for implementation delays and longer walks for users to reach bus stops identified in conformance to environmental planning, the bus transport sector is getting more organised.
- Public sector planning of services has allowed government to take a key role in ensuring service dependability and safety, and to provide new services and infrastructure. This has given the regulator an opportunity to review a number of service issues, including minimum frequencies, mainline and feeder routes, designated bus stops, region wide smart card for fare etc.[19]

Delhi – Privatisation to Corporatised Privatisation

With the recent **corporatisation of private stage carriage or the cluster approach, the bus transport market in Delhi has transitioned from competition 'in-the-market' to competition 'for-the-market'.** The Transport Department of Government of Nation Capital Territory of Delhi is entrusted with the responsibility of providing an efficient public transportation system, control of vehicular pollution, registration of vehicles in Delhi, issuance of Driving licences, issuance of various permits, collection of road taxes. The department is also responsible for policy-making, co-ordination, implementation, monitoring and regulatory functions of all the Transport related aspects of National Capital Territory of Delhi. Delhi Transport Corporation (DTC), an agency of the transport department of the Govt. of Delhi is the main public provider of bus service in the city.

In a major drive in 1992, in order to augment a strike-bound and underutilised DTC fleet, an overwhelming majority of private stage carriage permits were issued by the government under a new scheme. While the resultant red line bus service (subsequently

[17] State Policies Affecting Competition: Passenger Road Transportation Sector, NCAER (2007)
[18] Supra Note 15
[19] *Ibid*

changed to blue line) helped fill some service gap, it soon led to a dominating private bus market that was largely profit driven, fragmented, inefficient and unsafe. The main issues with the bluelines included dangerous driving and overtaking, frequent tampering of speed governors, unscheduled stoppages and waiting for get full load, ill maintained buses, rude crew behavior, non-adherence to the fixed working hours (eight hours), curtailment of routes at the will to avoid rural or low catchments area, non-adherence to motor transport worker's act and unqualified staff etc. An analysis conducted by Steer Davies Gleave (SDG) into the privatised Delhi bus network, highlighted 'on-road competition' as the largest systemic contributor to unsafe driving and accidents (DIMTS 2007). The corporatisation of private stage carriers has brought in some regulated discipline.

The reform timeline

Timeline	Drivers of Reform	Reform	Output
1948	Demand for Local bus service	Delhi Transport Service (DTS)	Public Bus Transport Service
1950-58	DTS was reconstituted under the Road Transport Corporation Act in 1950	DTS reconstituted as Delhi Road Transport Authority' (DRTA)	Operated as an undertaking of Delhi Municipal Corporation
1971	• Inefficient functioning • Revenue leakage • High operating costs • Recommendation of a Working Group of the Planning Commission	Delhi Transport Undertaking (DTU) taken over by Government of India from the Municipal Corporation	• Delhi Road Transport Laws (Amendment) Act, in 1971 • DTC (Delhi Transport Corporation) was set up in 1971
1992	• Shortage of DTC conductors and strike • Operators declined to accept the current permit scheme	**New Scheme for Private Bus Service in Delhi under Stage Carriage Permits**	• Overwhelming majority of private stage carriage permits issued • Redline Bus services, later changed to Blue Lines
1996	Executive decision	DTC Taken over by Govt. of National Capital Territory, Delhi	DTC operates city buses as well as interstate buses in and around Delhi, connecting the city with 6 other states of India.
2002	High Court Order	All buses to be run on Compressed Natural Gas (CNG)	Reduction in Pollution
2011	• Fierce competition 'in–the-market' led to negligent, rash driving and fatal accidents • CAG Performance audit (2006	**Corporatisation of private stage carriage' or the 'cluster approach'**	• Identifiable corporate Brand - Delhi Transit

Reform experience/impacts

- The 1992 scheme restricted the total number of buses per individual to five and per company to ten. This feature limited the scheme to small investors who could not be expected to hire a professional management team to run the operations while also parceled out each route amongst a multiplicity of different private stage carriage owners.[20]
- The prospective permit holders were outside the purview of the Motor Transport Workers Act, 1961 that defines the working conditions of drivers employed by owners employing five or more motor transport workers.
- In the absence of any mechanism for designing routes, the transport authority gave more importance to the pleas of the owners than to consumer interests. Consequently, buses were rarely seen on the unprofitable routes.
- The pressure from the powerful blue-line operators would often force the DTC drivers and even the route planners to withdraw DTC buses from profitable routes.
- Buttressing a growing public resentment with the bus services, an audit by the CAG brought out operational weaknesses in the bus transport and laid the foundation for reforms.
- For one, the government recognised the need to decouple the operator's revenue from the number of passengers carried in order to avoid the negative effects that result from competition from passengers on the streets.[21] Identifying additional sources of non-traffic revenue such as that from advertising became relevant.
- Under a new corporatisation scheme, Delhi's 657 bus routes have been bundled into 17 area-based clusters. The regulator defines a package of service schedules and functional specifications under one recognisable brand, 'Delhi Transit'.
- The private concessionaires are allotted clusters who bring in their buses, arrange for their cleaning and maintenance and provide for the staff.
- For the services rendered, the concessionaire are paid on the basis of an indexed cost system having a fixed component reflecting the bus cost, a variable component to factor in the fuel and maintenance costs and a component that accounts the wages keeping in mind the consumer price index.
- A Gross cost model has been adopted for running these buses so that there is competition for-the-market as against competition in-the-market. Under the scheme, all the revenues go to the Delhi Transport Corporation.
- The buses are operated as per a unified timetable with 40 percent DTC buses and 60 percent buses of private concessionaires on each route.
- The tender specifies rates for 'Short Term Marginal Service' and 'Long Term Marginal Service' increments, enabling the regulator to add routes, change frequency or redeploy resources.
- The Delhi integrated multi-modal transit limited (DIMTS) has been set up as a Special Purpose Vehicle as a joint venture of GNCTD and the Infrastructure Development Finance Company (IDFC).
- It acts as an Integrated Mechanism (IM), responsible to handle the bid management process, monitoring and management of the operation of private stage carriage buses, preparation of unified timetable (UTT), monitoring of service level standards and other key aspects.

[20] Bus System Reform in Delhi, UITP Asia Pacific Assembly (2009)
[21] Bus Transport in Delhi, Centre for Civil Society (2009)

Brief Snapshot from India - Indore and Vadodara[22]

An analysis of the different case projects in Indore and Vadodara[23] reveals that a proper PPP framework was one of the factors responsible for making a project successful. **The regulatory body (the local agency or Special Purpose Vehicle) analyses demand, plans routes, fixes fares, gives out tenders, and monitors performance regularly.** Success has resulted from proper identification of risks and rewards and their allocation to the party which was best able to manage it, quick decisions made regarding tariffs, routes, frequency, etc., transparent selection of the operator, continuous consultation with stakeholders and provision of space for facilities.

In Summary

The above discussion reviews bus transport reforms and policy actions in select cities/countries with varying outcomes. There are however some broad themes that commonly act as primary drivers or the principal stimuli for planned structural change such as a leading political vision and/or policy, a need to respond to rapid growth in demand; a need to address serious challenges such as traffic congestion or air quality; need to improve regulatory framework or operator structure/quality; or a need to respond to serious degeneration of the available passenger transport services.[24]

A study conducted by University of Sydney, 2011 on urban bus services in developing countries and countries in transition shows structural changes taking place along three key elements: change in the role of the regulator/transport authority, change in the form of operators, and change in transport supply. Whatever be the regulatory prescription, the outcomes are generally considered successful if tangible improvements in urban bus service ridership, mode share, public transport quality, new investments, financial sustainability, or its profitability are seen.

This note avoids being recommendatory and in doing so encourages the project countries to draw their own lessons from the regulatory/policy experiments undertaken by other countries over the years. To aid self-assessment, a matrix between typical bus industry structures, their inherent problems and the counter-balancing regulatory responses can be reviewed at Annex I.

22 Supra Note 12
23 *Ibid*
24 Supra Note 14

Annex 1: Counter-Balancing Measures for Different Bus Industry Structures in Developing Cities

Industry Structure	Inherent Problems	Counter-Balancing Regulatory Measures
Monopoly	• Low incentives to productivity and cost control • Low demand-responsiveness • Ill-defined corporate service/financial objectives • Vulnerable to political interventions, especially on fares, staffing • Vulnerable to imposition of social obligations – fare concessions, loss-making routes • Tendency for 'regulatory capture' • Illegal operators develop to fill quantity and quality gaps in market	• Establish performance targets and accountability for their achievement within a sound legal basis • Public service obligations to be defined, provision to be tendered, cost to be borne by sponsoring agency • Establish surrogate measures of efficiency & cost-effectiveness • License private operators to provide 'niche' services • Define corporate objectives esp. for public service and cost recovery.
Few large-scale operators (oligopoly)	**All Private** • Tend to enter non-competition arrangements • Competitive incentives muted • Lack of competition inflates costs, reduces demand- responsiveness **Mix of state-owned enterprises (SoEs) and private operators** • SoEs enjoy privileged access to best routes and/or are burdened with public service obligations • SoEs enjoy some protection against competition	**All Private** • Structure franchises to promote competition (operating areas, duration, replaceability • Establish objective, de-politicised fare escalation strategy, possibly including performance incentives **Mix of SoEs and private operators** • Create 'level playing field' in the market • Establish benchmarking to compare performance • Establish objective, de-politicised, fare escalation strategy.
Mix of small and large-scale public/private operators	• Large operators engage in predatory competition against small operators • Large operators buy out small operators • Small operators form association to protect their interests • Private operators neglect unviable services	• Regulatory framework to define structure of competition • Establish a de-politicised fare escalation strategy • Encourage small operators to provide 'niche' services • Maintain realistic service and infrastructure obligations • Regulator maintains vigilance through systematic surveys and inspections
Multiple small scale & individual private operators	• Each vehicle is a separate business; no operator will accept low demand routes and times or be accountable for performance of the whole route • Operators tend to wait until full of passengers, causing uneven headways, lack of capacity, unreliability • Too many licensees for effective control by authority • Tendency of control of routes, territories by illicit groups • Small-scale operators tend to breach service and vehicle rules	• To establish control - must consolidate operators into groups capable of accepting collective responsibility for a route • Since cross-subsidy is not feasible, unviable routes must be supported by external subsidy.

Source: Bus Regulation and Planning – Bus Sector Reform, Federal Ministry for Economic Cooperation and Development, Germany

References

1. Advancing Urban Passenger Transport Reform in the Europe and Central Asia Region, Reforms Option Report, Dec 2003
2. Urban Bus Toolkit: Tools and Options for reforming urban bus systems, the World Bank and PPIAF
3. Bus Karo: A Guidebook on Bus Planning & Operations, EMBARQ
4. Case Studies – Urban Bus Toolkit
5. *Public Transport Reforms in Seoul: Innovations Motivated by Funding Crisis John Pucher, Hyungyong Park, and Mook Han Kim, Rutgers University Jumin Song, University of Michigan*
6. Bus Service Industry In Britain, (http://www.lawteacher.net/free-law-essays/transportation-law/bus-service-industry-in-britain.php)
7. Public Road (Passenger) Transport Regulations in India, CUTS Institute for Regulation & Competition, Working Paper, 2013, S.Sriraman
8. Urban Bus Services in Developing Countries and Countries in Transition: A Framework for Regulatory and Institutional Developments, Brendan Finn, ETTS Ltd Corinne Mulley, University of Sydney, 2011
9. Study of Urban Public Transport Conditions in Santiago, Chile 1990-2005, Urban Bus Toolkit - PPIAF
10. Case Study of Tran Santiago, Santiago, Chile
11. State Policies Affecting Competition: Passenger Road Transportation Sector, NCAER (2007)
12. Bus System Reform in Delhi, UITP Asia Pacific Assembly (2009)
13. Bus Transport in Delhi, Centre for Civil Society (2009)
14. Urban Bus Services in Developing Countries and Countries in Transition: A Framework for Regulatory and Institutional Developments, Brendan Finn, ETTS Ltd Corinne Mulley, University of Sydney, 2011