



**Sustainable Transport:  
A Sourcebook for Policy-makers in Developing Cities  
Module 3c**

# **Bus Regulation and Planning**

– revised December 2004 –



Deutsche Gesellschaft für  
Technische Zusammenarbeit (GTZ) GmbH

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for Economic Cooperation  
and Development**

## OVERVIEW OF THE SOURCEBOOK

### Sustainable Transport: A Sourcebook for Policy-Makers in Developing Cities

#### What is the Sourcebook?

This *Sourcebook* on Sustainable Urban Transport addresses the key areas of a sustainable transport policy framework for a developing city. The *Sourcebook* consists of 20 modules.

#### Who is it for?

The *Sourcebook* is intended for policy-makers in developing cities, and their advisors. This target audience is reflected in the content, which provides policy tools appropriate for application in a range of developing cities.

#### How is it supposed to be used?

The *Sourcebook* can be used in a number of ways. It should be kept in one location, and the different modules provided to officials involved in urban transport. The *Sourcebook* can be easily adapted to fit a formal short course training event, or can serve as a guide for developing a curriculum or other training program in the area of urban transport. GTZ is meanwhile elaborating training packages for selected modules, being available from June 2004.

#### What are some of the key features?

The key features of the *Sourcebook* include:

- A practical orientation, focusing on best practices in planning and regulation and, where possible, successful experience in developing cities.
- Contributors are leading experts in their fields.
- An attractive and easy-to-read, color layout.
- Non-technical language (to the extent possible), with technical terms explained.
- Updates via the Internet.

#### How do I get a copy?

Please visit <http://www.sutp-asia.org> or <http://www.gtz.de/transport> for details on how to order a copy. The *Sourcebook* is not sold for profit. Any charges imposed are only to cover the cost of printing and distribution. You may also order via [transport@gtz.de](mailto:transport@gtz.de).

#### Comments or feedback?

We would welcome any of your comments or suggestions, on any aspect of the *Sourcebook*, by e-mail to [transport@gtz.de](mailto:transport@gtz.de), or by surface mail to:  
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## Modules and contributors

*Sourcebook Overview and Cross-cutting Issues of Urban Transport* (GTZ)

### Institutional and policy orientation

- 1a. *The Role of Transport in Urban Development Policy* (Enrique Peñalosa)
- 1b. *Urban Transport Institutions* (Richard Meakin)
- 1c. *Private Sector Participation in Transport Infrastructure Provision* (Christopher Zegras, MIT)
- 1d. *Economic Instruments* (Manfred Breithaupt, GTZ)
- 1e. *Raising Public Awareness about Sustainable Urban Transport* (Karl Fjellstrom, GTZ)

### Land use planning and demand management

- 2a. *Land Use Planning and Urban Transport* (Rudolf Petersen, Wuppertal Institute)
- 2b. *Mobility Management* (Todd Litman, VTPI)

### Transit, walking and cycling

- 3a. *Mass Transit Options* (Lloyd Wright, University College London; Karl Fjellstrom, GTZ)
- 3b. *Bus Rapid Transit* (Lloyd Wright, University College London)
- 3c. *Bus Regulation & Planning* (Richard Meakin)
- 3d. *Preserving and Expanding the Role of Non-motorised Transport* (Walter Hook, ITDP)

### Vehicles and fuels

- 4a. *Cleaner Fuels and Vehicle Technologies* (Michael Walsh; Reinhard Kolke, Umweltbundesamt – UBA)
- 4b. *Inspection & Maintenance and Roadworthiness* (Reinhard Kolke, UBA)
- 4c. *Two- and Three-Wheelers* (Jitendra Shah, World Bank; N.V. Iyer, Bajaj Auto)
- 4d. *Natural Gas Vehicles* (MVV InnoTec)

### Environmental and health impacts

- 5a. *Air Quality Management* (Dietrich Schwela, World Health Organisation)
- 5b. *Urban Road Safety* (Jacqueline Lacroix, DVR; David Silcock, GRSP)
- 5c. *Noise and its Abatement* (Civic Exchange Hong Kong; GTZ; UBA)

### Resources

6. *Resources for Policy-makers* (GTZ)

### Further modules and resources

Further modules are anticipated in the areas of *Driver Training*; *Financing Urban Transport*; *Benchmarking*; and *Car Free Days*. Additional resources are being developed, and an Urban Transport Photo CD-ROM is available.

# Bus Regulation and Planning

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Richard Meakin has undertaken consultancy assignments in major cities in more than twenty countries in Asia, Africa, the Middle East and the Caribbean. Most were studies relating to the organisation, planning and regulation of public transport. His clients have included international aid agencies, governments and the private sector.

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## 1. Introduction

### 1.1 The scope of this module

This chapter provides guidelines for the planning and regulation of bus systems in large cities in the developing world, whose urban public transport systems are 'less developed'.

The term 'bus' includes all road-based, frequent, fixed route passenger services, including all sizes of bus from 9-seat minibuses (Bali, Indonesia) to the largest rigid 12-metre double deckers (Hong Kong, Dhaka, Mumbai) and bi-articulated buses in Curitiba, Brazil. The bus transport industry embraces a wide range of operating regimes, from individual owners in loose organisations (cities in Indonesia, Pakistan, Bangladesh, Philippines) to large corporate bus undertakings in private ownership (Singapore, Hong Kong) and publicly owned undertakings (cities in China, Bangkok, Damri in 14 Indonesian cities, Bangladesh Road Transport Corporation - BRTC in Dhaka) (see Figure 1).

Generally, the stage of development of a city's urban bus system will reflect the overall level of development of the economy, but there are many exceptions. There are cases where the bus system is more advanced than other cities of similar income levels and other cities in the same country (for example Curitiba in Brazil, and Bogotá in Colombia). There are other examples where bus systems are relatively less advanced than their general level of development might suggest (such as Kuala Lumpur).

There are many reasons for these variations in the levels of bus services. Prominent among these is that in cities where buses are the most efficient (such as Singapore, Hong Kong, Curitiba) governments have committed themselves to consistent, long-term policies to develop public transport services. These policies are often applied together with land use controls and transit-oriented development incentives, and measures to restrain the use of private vehicles. The continuity of policy in these cities has usually reflected the continuity and authority of their city or national governments. It may also reflect the influence of individual champions (Bogotá, Curitiba) and cultural and historical factors.



**Fig. 1**  
*Subjects of bus regulation range from paratransit in Cairo, 'camelios' in Havana, minibuses in Surabaya, articulated buses in Bangkok, through to the double-articulated, 270-passenger buses of Curitiba.*

Karl Fjellstrom, Manfred Breithaupt (Cuba), 2002



## 1.2 Criteria for defining the level of development

The level of development of an urban public transport system can be measured by various criteria. The following criteria differentiate public transport systems at the ‘lower’ and ‘higher’ levels of development:

- whether a coherent policy framework exists,
- whether the formal (regulated) public transport system has been able to respond to growth in demand or, alternatively, whether a substantial portion of demand is met by informal (largely unregulated) ‘paratransit’ modes, and
- whether a formal system of subsidies exists.

These three criteria are described below. They indicate:

- whether the government has adopted a coherent approach to managing urban transport as opposed to responding to events as they arise,
- whether government has sufficient administrative and technical capability to effectively plan and regulate services, and
- whether there has been the political will to make difficult decisions, such as maintaining bus fares at levels that permit operators to cover costs, or taking measures to curb the use of private cars.

### Policy and regulatory framework

The existence of explicit policies supporting public transport, establishing a hierarchy for different transport modes, and for fare-setting, is a characteristic of developed systems. Equally important is the capability to implement those policies, and to sustain their progressive implementation. Developed systems have usually addressed the issue of operating public transport under public or private ownership, or a mixture of the two.

### Paratransit

Paratransit is the informal public transport sector. It typically comprises small vehicles, in small-scale or individual ownership, often self-regulating or controlled by illicit groups, often with vehicles hired to drivers on a daily basis. Paratransit often develops spontaneously to fill gaps in the capacity or quality/price range of

formal public transport. Examples include the 5,000 ‘commuter vans’ in Bangkok, the thousands of remise vehicles (charter car plus driver) in Buenos Aires, and public light buses in Hong Kong. Sometimes it develops in the absence of a formal public transport system. Large numbers of paratransit vehicles operating in a city usually indicates deficiencies in the formal transport system. Their presence may also indicate government’s incapability to effectively administer regulation, often because the regulatory framework is inappropriate. An ‘undeveloped’ city bus system may comprise predominantly paratransit modes (Indonesian and Pakistani cities). The paratransit sector will usually reduce in scale, at least relatively to the whole public transport sector, as development advances.

### Formal subsidy

The existence of a system of subsidies is an indicator of development because it requires a policy basis (subsidies recognize the social and economic importance of urban public transport), a fairly high administrative and analytical capability, and accurate ridership, cost and revenue data. Because subsidies are paid from public funds, the administrators and recipients of subsidies are likely to be politically accountable for the use of those funds. Often it is the growing size of subsidies that brings urban public transport to the top of the political agenda, rather than the deficiencies of the services provided.

Many developing cities have a publicly owned bus company incurring deficits which are met ‘by default’ from public funds. This is not regarded as a formal subsidy within the current definition. Indeed, such a situation is common in less-developed systems and reflects the difficulty of resolving the policy dilemma between ensuring a public service and earning a return on resources invested. It must be noted, however, that many developing cities have bus systems which operate without subsidies. In addition, many advanced systems such as Curitiba and Bogotá also operate without subsidies.

Applying the three criteria above, the major cities of South and Southeast Asia including Colombo, Jakarta and the secondary cities of Indonesia, Dhaka, cities in Pakistan, Thailand,

Philippines, (but excluding Singapore), Africa, South America (with several notable exceptions) and some cities in the Middle East can all be considered developing systems. All the advanced cities of Europe, North America and Australia are excluded from the definition.

Even some cities with a mass transit railway system, such as Bangkok, have relatively ‘undeveloped’ bus systems according to the definition above. Hong Kong and Singapore had probably passed the threshold of ‘developed’ in this sense by the mid-1970s.

### 1.3 The focus of this module

The objective of this module is to describe principles and procedures to assist the authorities in cities with ‘less developed’ bus systems. It is essential that these authorities:

- recognize the importance of and need for maintaining a coherent set of policies,
- lay the foundations for systematic public transport planning and regulation,
- once the foundations are established, identify steps by which the system will continue to develop as policies become progressive, additional human and financial resources become available, and experience is gained.

Effective public transport management is built on four foundations:

1. a **coherent policy**, and implementation strategies;
2. a **structure of the public transport industry** that is amenable to competition or regulatory control;
3. a **regulatory framework** that provides a legal basis to impose the right mix of obligations and incentives;
4. **regulatory institutions** that have sufficient capability and independence to undertake basic network planning, administer regulation and guide the development of the industry.

This module describes the impacts of different industry structures on ‘regulability’ and some principles and procedures of bus service regulation. In this context, regulation includes the processes of service planning, and monitoring performance.

## 2. Elements of organisation

There are five essential, hierarchical steps in organizing a public transport system.

1. **Prepare a coherent statement of urban transport policy, and outline strategies to implement them.** As described in Module 1a: *Urban Transport and Development Policy*, the foundation is a clear statement of transport policy for the city that defines principles, objectives and priorities for the use of roads and for public and private transport modes, including pedestrians and non-motorised vehicles. A policy to develop public transport will be much more effective if it is supported by other policies, particularly for land use - encouraging high densities on public transport corridors, and the use of mobility management measures to discourage car use.
2. **Install an effective planning process**  
It is essential that city government has the capability to monitor the transport system, to analyse the data to predict trends, and to design effective measures to influence future development towards policy objectives.
3. **Specify an appropriate and manageable structure and composition of the public transport industry.** The composition of

### Regulatory overload

#### Factors that affect the workload of regulation

The task of regulation – how much regulatory effort is needed to induce the operators to meet service objectives – is determined by:

- **The composition of the industry:** Who is to be regulated? How many operating units? In public or private ownership? What incentives do they respond to? Is regulatory policy consistent with their interests or is there resistance and a consequent need for a high level of monitoring and enforcement?
- **The scope and depth of regulation:** How many operating parameters are regulated (route, fares, operating schedule, vehicle number and type, other parameters)? How specific is the regulation – are all parameters specified in detail or is there a range within which operators are free to respond to market without seeking approval?

Source: Dorsch Consult, 1999

**Table 1: Regulatory overload - a strategy to restore the balance**

Objective	Strategy
Reduce the number of clients	Interact with a limited number of route organisations (route associations, cooperatives or companies), not 5,600 individual vehicle operators
Reduce the depth and scope of regulatory control	Regulation should focus on strategic planning and regulatory policy – a guiding role – not on operational details. Transfer more responsibility for internal coordination of the route and operational aspects to the route organisation. Give the route organisations some discretion to adjust services to meet demand, within guidelines.
Reduce regulatory complexity	Simplify the categories of vehicles and routes. Eliminate redundant regulations. Choose the best operator by tender; this is likely to require less subsequent intervention by regulator.

Source: Dorsch Consult, 1999

the industry means the number of vehicles, the size of vehicles and fleets, the mix of individuals and different corporate forms, and whether any undertakings are in public ownership. In many cases the composition of the industry cannot be easily changed because of extensive interests in the status quo. Generally a pre-condition for effective regulation is that fragmented ownership must be consolidated into cohesive organisations of at least one route.

**4. Develop an appropriate regulatory regime.**

The regulatory regime must define the powers, duties and freedoms of both the authority and the operators. The mix of powers of direction and incentives must be effective in inducing the public transport industry to comply with government’s policies and plans (see box “Regulatory Overload”).

**5. Establish an effective planning and regulatory institution.**

Planning and regulatory institutions must be set up and must be fully capable of administering the planning and regulatory procedures. There are many examples of institutions that are not capable of planning and regulating, either because the industry composition is too fragmented or because the regulatory instruments are not appropriate to industry structure and the policy objectives. In some cities the regulatory system has been in-herited from another era and is no longer effective in regulating the present industry structure. In such cases a ‘regulatory over-load’ develops which allows the regulators to enforce the regulations partially or selectively. This often results in bureaucratic

and corrupt practices and a ‘regulatory vacuum’ which is filled by illicit organisations.

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*“The system’s shortcomings cannot be overcome by a series of fragmented measures. Nor does the answer lie in investment in ... facilities. Rather, reform of the organisation of the public transport sector and its system of regulation is needed, together with measures to limit the growth and impact of road traffic.”*

Dorsch Consult, BUIP, 1999

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These five essential steps in organizing an urban bus system are considered in detail in the sections following.

### 3. Public transport policy

#### 3.1 Scope and content

Drafting, adopting and maintaining a coherent and realistic public transport policy, which is within the constraints of available resources, is fundamental to bus regulation and planning.

Public transport policy will be one component of a wider urban transport policy which will state broader urban development policies, including social, economic, environmental and land use objectives.

The public transport policies of different cities in the same country may be based on the same principles, which may be defined in national legislation. There may therefore be a national policy for urban public transport, which defines objectives, strategies, priorities and programs for the country. Alternatively, public transport policy for one city may differ markedly from that for another city (as for instance, the integrated land use and transport policy of Curitiba in Brazil differs from that in Sao Paulo).

The three policy principles that have provided the basis of the successful public transport policies in Singapore and Hong Kong over some thirty years provide an excellent starting point and are recommended for large, densely populated cities:

- develop transport infrastructure,
- improve the public transport system,
- manage the demand for road use.

In some countries, the economic dominance and the disproportionate size of the capital city may warrant special policy measures, perhaps to mandate the use of large buses, to develop rail mass transit, and to restrain private car use.

A policy for public transport should address, among other issues:

- the target future balance between private and public modes of transport and the extent to which investment, fiscal and road management policies should favour the use of public transport over private vehicles,
- the extent to which market forces (as opposed to government direction) should be used as an incentive to develop the public transport system,

- whether fares should be controlled to ensure affordability by lower-income or disadvantaged groups, whether fares should be reduced by subsidies and, in that case, how to ensure efficiency and demand responsiveness.

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*“A coherent and realistic public transport policy, which is within the constraints of available resources, is fundamental to bus regulation and planning.”*

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The urban transport policy should be widely published for consultation with stakeholders and the community, including public meetings. In the light of comments received the policy should be revised where necessary and re-published every two to three years. The process of consultation, especially if it results in a degree of consensus, can enhance the authority of government agencies in overcoming resistance to proposals. In many transport issues, the interests of a minority have to be weighed against benefits to the community as a whole.

#### 3.2 Strategies

The policy statement will be supported by strategies. Strategies are the measures taken to implement policies. They should include targets and a time frame. In a developing city, strategies are likely to include:

- establishing priorities for the allocation of road space between the competing demands of utilities, frontages, pedestrians, non-motorised vehicles, public transport vehicles and stops, parked vehicles and moving vehicles;
- improving road capacity by traffic management and enforcement measures to improve the average bus speeds to a target of 15-18km/h, achieving this by bus priority measures where warranted;
- building more effective institutions to implement policies and plans;
- containing or reducing the role of paratransit modes to a target level, by confining them to secondary routes by a progressive strategy of creating competition and imposing restrictions, and consolidating fragmented owner-

ship into companies or cooperatives to facilitate control;

- revising the road traffic and transport legislation and the licensing system to create appropriate powers;
- ensuring that public transport services provide comprehensive, safe, adequate coverage of the city, and that they provide a full range of quality, including premium services (air-conditioned, all-seated);
- ensuring the provision of adequate bus infrastructure including stops, shelters, bus bays, terminals and turn around facilities;
- giving priority to pedestrian routes accessing bus stops and terminals.

The combination of targets to be adopted will depend on the current status and performance of the bus system. Performance may be measured with reference to a variety of criteria:

- performance achieved in other cities with comparable conditions,
- objective performance criteria (a full list appears below),
- feedback from users and potential users, either unsolicited complaints and suggestions or by systematic attitude surveys.

## 4. The planning process

Generally, in a regulated transport system, the authority prepares operational plans which are then implemented by operators who respond to directives by the authority and to market incentives.

In a deregulated system, the authority may not undertake service planning, but will monitor passenger demand and the supply of services and may intervene where the market does not provide services on routes, or at times, which are regarded as essential.

This section describes the three basic elements of the planning process:

1. inputs;
2. process; and
3. outputs.

### 4.1 Industry structure

Bus route and service planning need not be sophisticated or require large resources, but it should be progressive, systematic and realistic. Many transport agencies in developing countries do not undertake even a simple planning process because the basic professional skills are not available and it may be perceived that there are severe constraints in imposing service changes on the operators.

Where an urban bus industry comprises a few large-scale operators, especially if they have district franchises or 'zones of influence' and the regulatory framework confers responsibility to provide an adequate service within those zones, responsibility for service planning may be given to the operators. However, the authority will retain strategic planning functions, for instance predicting changes in demand and adjusting operators' zones and contractual terms to ensure future demand is met.

Where the industry is fragmented, consisting of many small-scale operators, especially if multiple operators share each route, then it is not feasible for the operators to prepare plans. In this case, the authority must prepare plans specifying the routes, minimum frequencies, hours of operation and possibly fares. A mechanism is needed to create incentives for operators

to cooperate to open new routes and change existing routes, or there must be a means of requiring them to implement changes. As discussed later, this is very difficult to implement in practice.

In a mixed system of small and large operators, government might undertake the route planning for the small-scale sector, while the large operators, including any state-owned bus operator, undertake their own planning and submit their proposals to the authority for approval. The authority will then vet plans submitted by the big operators to ensure that overall objectives are met and to resolve any conflicts.

A monopoly operator also presents problems of planning and regulation. A monopoly has weak incentives to efficiency and demand-responsiveness and is vulnerable to the imposition of social obligations and constraints on fares. The threat of replaceability is low, and performance may not be readily compared with other operators.

**The planning horizon**

Bus service planning is a cyclical, incremental process. Stages in the planning cycle are shown in Figure 2. The cycle may be repeated every year where institutional capability allows or where the transport system is undergoing rapid change. Every two years is sufficient where the system is more stable and institutional capability is limited. In a city with limited professional skills and a large number of stakeholders, a major re-organisation of urban transport services may not be feasible, so incremental changes are expedient.

The horizon for planning should be:

- two to three years for changes such as extending services to a new development area which requires new infrastructure such as terminals and depots. It is important that the need for public transport infrastructure is recognised, and provision made at a very early stage in the land use planning process. The lead time for acquiring land and constructing a new bus depot may be two years or more.
- two-years for network changes which require the acquisition and financing of significant numbers of large buses, or where a tendering process is involved. The delivery time for new buses can be more than one year.

- a one year or six-month planning horizon is sufficient where the network is small, with many small-scale operators, operating mass-produced small vehicles.

The annual plan should be published in draft form. Consultation with users and stakeholders must be part of the cycle.

**4.2 Planning inputs**

The broad purpose of planning is to identify how far the needs of public transport users and potential users are being met, and to close any gap between what’s provided and what’s needed. Thus there are two elements:

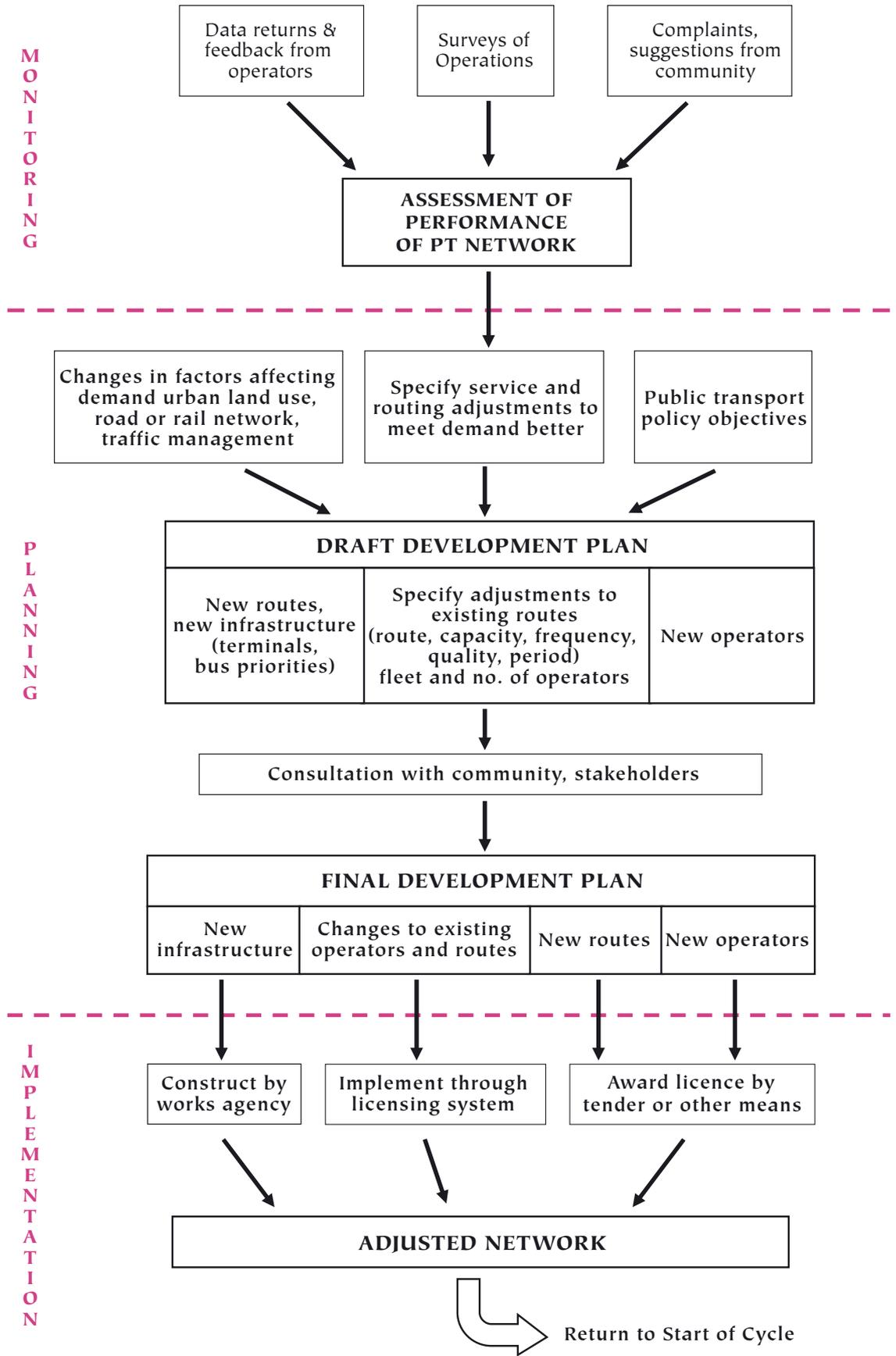
- assessing what services are provided;
- deciding what services are needed to meet demand, or to meet policy objectives.

Inputs to the planning process are:

- policy objectives;
- the status and performance of the existing transport system, as measured by a wide variety of parameters, many derived from a systematic performance monitoring programme and feedback from users and stakeholders;
- changes to the operating infrastructure (new roads, terminals, traffic management schemes, changes to traffic speeds, bus priority measures);
- market factors (forecasts of total public transport demand, population redistribution, new housing, commercial, retail, educational or industrial areas, car and motorcycle ownership rates, cost of fuel and registration fees, parking controls and charges, changes in the capacity or fares of competing transport modes, legal or illegal);
- income levels – a rapidly growing economy will enable an increasing proportion of people to acquire private vehicles if the public transport system does not meet rising aspirations of comfort and convenience. The transport market begins to differentiate demand for different levels of tariff and service quality at an early stage;
- the legal and institutional environment.

Since planning is a continuous, cyclical process, data on the status and performance of the trans-

**Fig. 2**  
*The planning cycle.*



port system must be monitored continuously. Data will include quantitative performance indicators as well as indicators measuring the extent to which demand, in terms of quantity and service quality, is being satisfied. The data required is described below.

#### 4.2.1 Performance indicators

The resources employed in bus services should be put to the most productive and efficient use. For this purpose there is a need to evaluate the operational performance of bus services and the standard of service being provided to users. Carefully chosen performance indicators can highlight the deficiencies of bus services and indicate where improvements are needed and provide the means for evaluating improvements and changes.

Monitoring should be based on data that can be relatively easily obtained without relying too heavily on data submitted by operators. Field surveys are needed to obtain some of the data. The following key operating performance indicators are recommended (some of these parameters are taken from World Bank Technical Paper No. 68 *Bus Services -Raising Standards and Lowering Costs*):

##### *Passenger volumes*

A basic indicator of productivity is the number of passengers carried in relation to the capacity of the system. This is expressed by the average number of passengers per operating bus per day. The indicator can be used at the network, operator or service level. A reasonably well-managed bus company with dense all-day demand should achieve up to 1,000 passengers per bus per day for a single-deck bus with a crush capacity of 80. In 2003, Hong Kong's two largest bus operators, KMB and Citybus, carried 780 and 700 passengers per day per bus. Hong Kong's fixed-route franchised 16-seat minibuses carry about 500 passengers per day. In Bali in 1999 the average passenger volume was about 70 passengers per 9-seat vehicle per day.

Other measures of productivity are:

- passenger boardings per vehicle trip;
- number of round trips made by each vehicle per day.

##### *Fleet utilisation*

The proportion of a bus fleet that can be put into service each day indicates the effectiveness of bus procurement, maintenance, and staff availability. A well-run bus company will achieve a fleet utilisation of 80-85 per cent.

In many developing cities buses are owned by individuals or small groups, many of which are owner/drivers. Because of political pressures and lack of monitoring, the number of vehicle licenses is often excessive in relation to the passenger demand, and unlicensed vehicles may also be operating. As a consequence of over-capacity vehicles must queue in terminals to gain a full load.

##### *Vehicle kilometres*

Another indicator of the productivity of a bus fleet is the total distance travelled by buses in service, usually expressed in average kilometres per operating bus per day. A reasonably run bus service should achieve around 210-260 vehicle-kilometres per bus per day.

Route lengths and the number of round trips per vehicle per day should also be monitored. Generally, long routes are more vulnerable to disruption by delays due to traffic congestion. They also present scheduling constraints.

##### *Breakdowns in service*

The proportion of buses that break down in service is an indicator of vehicle age and type, maintenance and driving standards. A reasonably well-maintained fleet would expect to have breakdowns at a rate of no more than 8-10 percent of buses in operation each day. An operator with a modern, well-maintained fleet can achieve very high levels of mechanical reliability. Hong Kong's largest bus operator KMB, reported in 2003 that the average number of breakdowns in service was one per 2,759 trips.

##### *Fuel consumption*

Fuel consumption depends on the size and load of vehicles, fuel and engine type and the gradients and traffic conditions on the route. Maintenance and driving standards also have a considerable influence. Fuel consumption of a well-run system should be about 20-25 litres per 100 kilometres for minibuses.

##### **Low productivity minibuses in Bali**

The time spent waiting in terminals has a significant impact on vehicle productivity. In Denpasar, Bali it was found that most minibuses managed only 60-80 kms on the road each day, about four round trips. A typical angkot vehicle in Denpasar spent only about 5 hours, 21% of the day, operating on the road and another 5 hours at the terminal waiting in a departure queue.

Source: BUIP Public Transport Study. Final Report. Dorsch Consult 1999.

## Perceptions of large bus services in Indonesia

The results of an interview survey of *angkot* (small, cramped 12-seat minibuses) passengers in Bandung, Indonesia, indicated a relatively low level of satisfaction with the service comfort. However, when asked whether they preferred to ride in a regular bus, about 70% responded that they had no preference (33%) or preferred the mini-bus vehicle (37%). This result may reflect the fact that public transport users do not associate bigger buses with a better service. The only big buses in Bandung are those operated by the state-owned bus operator Damri. Damri buses are poorly maintained, unreliable, and chronically overloaded, resulting in very low levels of comfort and convenience. Similar perceptions are common in Surabaya, Indonesia, where as well as poor service, large buses are associated with lack of personal security.

## Experience from Dhaka

The Bangladesh Road Transport Corporation in Dhaka has resorted to renting its single and double-deck buses to drivers (many of whom were not employees) on a daily or longer-term basis in an effort to reduce the management problems of revenue leakage and difficult employee relations.

## Staff ratios

The average numbers of operating, administrative and maintenance staff per bus is an important indicator of efficiency at the company level. Less than four per bus is considered efficient. Due allowance must be made for whether conductors are carried, whether there are one or two operating shifts per day and any activities contracted out, such as maintenance or cleaning.

## Accidents

The accident rate provides an indication of the standard of driving and maintenance, but is greatly influenced by traffic conditions, in particular the volume of pedestrians. Comparisons should therefore be made with other vehicle types operating in the same area. In a well-run bus company operating under average conditions, accidents are likely to be in the range of 1.5–3.0 per 100,000 bus kilometres. In many countries there is no reliable accident reporting, analysis and publication mechanism so it is very difficult to estimate the rate without special surveys. KMB in Hong Kong reported 2.7 million kilometres per one injury accident in 2003.

## Dead kilometres

Dead, or off-service, kilometres are incurred when a bus is being operated without revenue passengers. These trips are typically when the bus is travelling between a terminal and a depot to and from overnight parking. In systems comprising individual minibuses vehicles may be parked near owners' and drivers' homes, and the vehicle may be used for family transport, so it is difficult to distinguish off-service journeys.

## Operating cost

The costs of bus services are mainly dependent on local labour and fuel costs, but are greatly influenced by the efficiency of operation and management and by traffic and road conditions.

In Sri Lanka in 2003 it was estimated that the operating cost of basic, truck-chassis type buses was about LKR 47 (USD 0.46) per km., including depreciation. KMB in Hong Kong, with a fleet of high capacity air-conditioned double-deckers with an average age of 7.4 years reported operating costs of HK\$ 15.03 (US\$ 1.94) per km in 2003.

The selection of the most appropriate vehicle type and capacity is an important aspect of public transport planning and this analysis should be applied at the route level in order to optimise costs.

## Operating ratio

Revenues should cover costs and produce a sufficient surplus to provide for investment and growth. The operating ratio is defined as total revenue divided by operating costs including depreciation, and should be around 1.05–1.08.

In cities with a large proportion of individual or small operators it is common for the driver to rent the vehicle on a daily basis. The owner receives a fixed and regular income that provides a return on his investment. The driver then needs to maximise the number of passengers carried in order to cover the vehicle rental, fuel costs and to provide an income. Under this system drivers have an incentive to drive fast and overload to maximize revenue. They tend to be reluctant to operate at times and locations where demand is low. Because neither the owner nor the driver has any responsibility for the overall regularity of the service, there are severe problems of maintaining the safety and quality of services. The daily rental system has developed as a simple working arrangement because it requires little management or accountability. The owner cannot easily assess his true operating ratio as total revenue is not known.

## 4.2.2 Quality of service indicators

### Introduction

Acceptable levels of service differ considerably from one country to another and are greatly influenced by income levels, the value placed on time, geographic and climatic conditions, availability of alternative modes, traditional standards, public attitudes and ethnic characteristics.

However, market research on transport services carried out worldwide repeatedly shows that public transport users consider reliability to be the most important quality of a transport service, followed by service frequency and journey speed. These are key to keeping the overall 'generalised cost' of travel down. While government policies tend to focus on keeping fares low,

availability and quality of service seem to be viewed as more important by users.

Although there is no set of standards that can be universally applied to the quality of bus services, a number of attributes can be measured.

### Waiting time

The time passengers have to wait for buses is a major factor in the overall quality of services. In developing countries the average waiting time should be in the region of 5-10 minutes, with a maximum wait of 10-20 minutes. The lower end of these ranges would apply to fairly short journeys with high frequency services and the upper limit would apply to long journeys and low frequency services.

The substitution of loosely organized paratransit services by a coordinated service, even without additional vehicles, will tend to make headways more regular and reduce average waiting time, as well as eliminating the extremely long waiting times that occur occasionally in paratransit services.

Waiting time does not need to be measured directly and can be assessed by monitoring:

- vehicle headways by service throughout the day to estimate average wait times;
- vehicle loads and passenger demand along the route to identify over-capacity situations resulting in long waits.

### Walking distance to bus routes

The distance that passengers have to walk to and from bus stops are indications of the network coverage provided by bus services. In reasonably well-served urban areas passengers should expect to be able to catch a bus within 300-500 metres of their home or workplace. Distances in excess of 500 metres may be acceptable in low-density areas but the maximum walking distance should not exceed one kilometre.

### Journey time

Passengers should not be expected to spend more than two to three hours each day travelling to and from work (door to door) in the largest urban area, and considerably less in a relatively small city. The average bus speed should not drop below 10 km/hr in dense urban areas with mixed traffic and in medium to

low-density areas journey speeds of around 25 km/hr should be achieved. In Bangkok in 1995 average morning peak journey times by main mode were:

- bus: 64 minutes;
- private car: 55 minutes;
- motor-cycle: 34 minutes.

The Urban Transport Data and Modelling Study 1995, quoted by TP3, p2-5.

### Interchanges

The need to interchange between routes or between modes adds to the time spent waiting and to passengers' inconvenience. It also adds to passengers' direct costs as a fare may have to be paid for each mode or service boarded. In a large city many commuters might be expected to interchange once but less than 10% of passengers should be required to interchange more than once. It is important to review and introduce changes to the route structure in order to reduce the number of interchanges.

The need to interchange is perceived by passengers as penalty over and above the actual time changing mode or route, even in the best public transport systems.

### Travel expenditure

While reliability is consistently scored as the most important quality of a transport service, travel expenditure is perceived to be very important in the choice of mode by low-income groups. The affordability of a bus fare is dependent on the income level of the users. Perceived high fares leads many to choose to walk. In developing countries a reasonable level of household expenditure on bus travel has been recommended not to exceed 10 percent of household income.

The average bus fare per journey will be increased by the proportion of trips where one or more interchanges, and the payment of two or more fares, is necessary. Discounted 'through fare' facilities, or free transfers are only available in sophisticated, integrated transport systems. Adjusting the network to match the pattern of demand by direct links can help to stabilise or even reduce fare costs.

## 4.3 The planning framework

The key measure of the effectiveness of a bus network is the extent to which it meets

### Generalized cost

Generalised cost estimates the total value of money and time expended on a trip, including walking time, waiting time, fare (converted to minutes using a value of time), in-vehicle time, walk time to final destination. Typically, walking and waiting time is perceived to be unattractive and is factored by about 2 relative to in-vehicle time. Boarding and interchange penalties are used to represent the inconvenience of an indirect journey. Additional waiting penalties at boarding nodes or an in-vehicle time factor on congested services can be used to represent congestion.

### Interchange and travel choice

A recent UK Study found that only 1 in 5 bus users rated interchanging as convenient. The interchange penalty was valued as equivalent to 4.5 minutes for bus travellers, 8.0 minutes for train travellers and 8.6 minutes for car commuters; a guaranteed connection could reduce the bus penalty to 0.9 minutes.

Source: Development Department Research Programme Research Findings No. 99 'Interchange and Travel Choice' Institute for Transport Studies, Leeds University. <http://www.scotland.gov.uk/cru/resfinds/df99-00.asp>

the community's travel needs. An efficiently planned route network underpins the financial performance of the sector as a whole and is critical to a competitive tendering/franchising system. Systematic network planning drives the overall cost effectiveness of the network. Matching vehicle types to demand levels while maintaining attractive frequencies is essential to improve competitiveness.

In many developing cities the pattern of movement is changing rapidly as new locations for employment and settlement develop. However, in many cases, the transport network is not responsive to such changes due to lack of a systematic planning process or constraints on change within the industry.

Knowledge of the system and experience may provide the basis of a crude planning process, and is better than no planning at all. However, in a system bigger than a small town, only a detailed analysis can produce the optimum route network, levels of service and capacity of vehicles to meet demand. Generally, the greater the resources and technology committed to data collection and analysis, the more cost-effective the resultant network will be.

Detailed passenger origin/destination data is necessary for network planning. The large volume of data and complex calculations means that the only practical means to analyse trip data and evaluate alternative network strategies is to use one of the many computer-based route network analysis software packages. The software identifies major desire lines and forecasts passenger volumes which enables the most appropriate service type and vehicle type to be identified.

The underlying financial performance can be estimated using this analytical process. It is also possible to examine alternative fare strategies using the same database by using appropriate fare elasticities.

Accurate estimates of the demand and commercial viability of a route are essential to the process of designing routes to be awarded by competitive tender. They are also necessary for the development of the tender criteria: for example, what criteria should be used to evaluate a bid that specifies a high frequency service

with small vehicles against a bid offering a low frequency service with large vehicles.

To get a true measure of the demand pattern it is necessary to undertake household surveys. Limiting surveys to the users of the existing transport network excludes those not using the service. Rather than conduct a citywide household survey – which is a major exercise – it may be possible to target the newer suburban and commercial areas for selective detailed surveys. The data from home interviews will be supplemented by other surveys.

Regular cordon counts are useful. The value of a single cordon count is limited as it is a single 'snapshot' but multiple counts generate time-series data which are very useful for monitoring the impact of newly introduced network changes. The value of the data increase if the cordon count sites are made at the maximum loading points along the corridor. However, in order to capture more routes it may be necessary to select sites that are not the maximum loading points. Cordon counts or other related surveys simply monitor performance and are not substitutes for origin/destination data.

In-vehicle surveys may indicate the level of interchange and overall network effectiveness. Boarding and alighting counts with surveyors logging passengers' entry and exit movements along a route gives an overall loading profile.

Attitudinal surveys of passengers have value in assessing overall network performance. Limited surveys can be used to monitor local network changes.

Electronic ticketing systems offer the potential to monitor passenger volumes on a daily basis. Ongoing 'surveys' of this nature are invaluable and allows seasonality patterns to be tracked in detail.

#### 4.4 Acquiring planning capability

Few government agencies or operators in developing cities have the capability to undertake systematic network planning. Typically, initiatives for route changes arise from customer complaints, through political channels or from the operators themselves. Gaps may be filled incrementally by a route extension or, less

commonly, by a new route. The city transport authority will approach an operator, perhaps the state-owned bus operator or one of the organizations controlling paratransit services. The basis on which the operator is selected is often unclear and certain operators may be treated more favourably than others.

A continuous network planning process of the highest professional standard is required in the larger cities in order that the needs of the citizens are matched with appropriate transport services.

The cost of engaging foreign consultants to undertake the network planning study is insignificant compared to the cost to a city of an inefficient route network. In time it is essential that the skills to undertake a detailed network review are acquired locally. The acquisition of this expertise can be accelerated by local participants learning from practical exposure while the analysis is being undertaken under the guidance of a foreign consultant. As local expertise increases, it may be used to maximum effect if it is concentrated in a 'centre of excellence' such as a 'think tank' or a university institute and may then be available to many cities on a consultancy basis.

Unfortunately, many network studies have been conducted, but the benefits were never realized because of the constraints on implementation often deriving from an inadequate regulatory framework, low institutional capability and vested interests in the status quo.



**Fig. 3**

*A hands-on training session in computer modelling carried out during the Bali Public Transport Study, Denpasar, 2000.*

Richard Meakin

#### 4.5 Planning outputs

The output of the planning process will be a service development plan, which should be updated every year or at most, two years. The plan will include the following components:

- a statement of how far demand is being met;
- a summary of proposed new routes and changes to existing services: the network, capacity, service quality, and fares, by mode, by operator, or by area and by route. Proposed changes within the one-year horizon will be specific, with a date. Changes beyond one year should be in outline, by 3-month or 6-month periods;
- a statement of the financial performance of different sectors in the industry, with an indication of the timing and scale of any future fare increases forecast to be necessary.



**Fig. 4**

*Hanoi's expanding large bus fleet has been one of the factors leading to large ridership gains.*

Walter Molt, 2002

## Public transport reform in Hanoi, Vietnam\*

\* Contributed by Dr. Walter Molt, Adviser to the City Government of Hanoi

### Background

Public urban transport in Hanoi was nearly non-existent a few years ago. Ridership was below 2% of motorised passenger trips. A few studies had been undertaken by bilateral and multilateral donors, and proposals had been made, but no implementation of any of the proposals had been realised.

A few years ago the German Government was asked to provide an integrated expert to the Urban Transport Planning Division of Hanoi. After the expert took up his assignment in summer 1999 the vision took shape to revitalize urban bus transport.

### Remarkable increases in ridership

While initially there were only 1,700 daily passengers on one of the major bus lines, which was chosen as a model line, this has increased today to 32,000 (Sept. 2002) passengers. While two years ago on all city bus routes together 30,000 passengers were transported per day, this figure has risen to 189,000. Two years ago there was not a single line with regular service; today there is regular bus transit service every ten minutes on a considerable number of lines and one line is covered by 5 minutes intervals. Two years ago there were only 500 owners of monthly tickets; in September 2002 there were 39,000 monthly tickets issued, valid always for one line. A new type of monthly ticket, valid for the whole network, started from October 2002. 14,000 were issued within the first three weeks. Two years ago most of the buses were over 20 years old; whereas today on all major lines there are new Daiwoo buses and 50 second-hand Renaults, a donation from the City of Paris.

### Key reform measures applied

Several measures can be identified as contributing to these accomplishments, each of course involving considerable change of management procedures:

1. **Regular and frequent service** (Figure 5). The previous operation was stuck in the typical supply-demand circle. Since the early 1990s the number of motorcycles in Hanoi has increased from near zero to more than 1 million, for a population of about 2.5 million. The motorbike in Vietnam is usually used by up to 3 people; 1.34 is the average occupancy. At the same time the government moved towards decreasing subsidies for

public transport. Bus drivers were required to carry a certain number of passengers per day and to deliver for this a certain amount of money to the company. They could keep the remainder.

While the plan was fulfilled in terms of delivering money to the company, there was fierce competition for passengers at the terminals between the buses of the many, often overlapping lines. Transport was practically exclusively from terminus to terminus, with almost no passengers boarding along the route of the buses, which circulated at unpredictable times. There was no interest in delivering monthly tickets or in telling passengers where they could get them. The bus was considered the private vehicle of the driver. As a consequence of this form of operation, public transport almost disappeared from the roads of Hanoi.

2. A young and **new manager** for the smallest bus company agreed to change this mode of operation. He had at his disposal just 15 old Renault buses, of which 12 were in working order. He managed to operate his buses to run the 19 kilometre line in 55 minutes. Therefore, with 12 buses, plus two in reserve, he could start to operate a 10 minute service. He hired some young people to propagate the monthly pass. As ridership continued to grow and buses were frequently overcrowded, new buses made available by the city were put into service. During peak hours a 5 minute service was introduced; 19,000 daily passengers were the result. When it was decided to operate the buses at such intervals all through the day, also in the very successful evening hours, the number of passengers climbed to 32,000. On a second line efforts were made without success to persuade the management of another company to also introduce a regular service with larger buses. Only when the management of this line was shifted to the first pilot company did the number of passengers improve to 14,000 per day, now of course in large buses. These two lines together now carry 37% of all bus passengers of the city. It is now normal along these corridors that groups of passengers can be seen waiting for the next bus.
3. In the meantime the city merged its bus companies into one company, which adopted the mode of operation of our pilot company. 250 new buses have been put in service, all are **standard 12 metre or at least 9 metre buses**. Large buses are of course the prerequisite to handle large numbers of passengers, and buses must provide a convenient place for standees. In the minibuses, used on many lines previously, this is of course not the case.

4. Unnoticed by political decision-makers, the design of the lines (routes) has changed. The large number of passengers are carried on **long lines in the major corridors**. Lines which are operating on small side roads, with 15 minute service intervals and minibuses, are simply unsuccessful. Lines which cross the city are much more successful than those which terminate in the centre. The successful network looks like the net of a streetcar or a metro system!

5. **Customer-friendly tickets.** A major objective of the shift to monthly passes was to reduce losses, as bus personnel often collected money from passengers without handing out tickets. The second purpose was to win regular passengers. In the meantime, with the new tickets valid for the whole network, riding a bus is very cheap for the customers. The personnel get higher salaries to compensate them for not any more being able to keep the fare money.

6. **Information for passengers.** For the first time in the history of Hanoi, a bus map has been published and posted at bus stops all over town. This is good progress, even though the information is far from perfect, as one cannot find the bus stops on the map. Changing buses remains an art unto itself, as there is as yet no concept of interchange for passengers.

### Asia-URBS recognition

Recently the European Union approved an Asia-URBS (a program partnering European and Asian cities and providing funding assistance) project with the Cities of Brussels and Paris being the partners. The objective is to improve environmental quality and road safety, and to make life easier for the socially disadvantaged, including the handicapped, by promoting public transport and raising ridership by 500%.

The project will concentrate on management training, driver education, creating a model workshop and depot for maintenance of buses and redesigning and realigning three model bus lines. In fact, the process of discussing and preparing the project has already initiated many reforms, which had long been on the agenda.

While some of the improvements have been quickly understood, it will still require a long time to improve all aspects of bus operation. One example is the limited road space capacity. Putting more busses on the road will eventually result in degrade the performance. Therefore infrastructure adjustments have to be made. Service levels similar to a fixed rail line can be

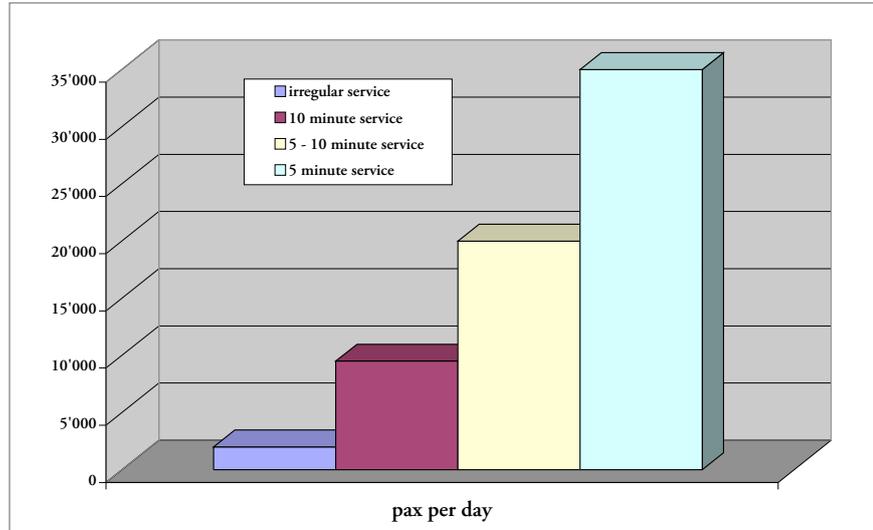


Fig. 5

*Increase in patronage on Line 32, with different levels of service.*

achieved, provided buses get their own infrastructure on the main corridors. Today the city is faced with the danger of over-investment in buses and under-investment in infrastructure. Yet still, it has to be understood that the essential aspect of better operation is a question of management, involving training on all levels.

In Hanoi public urban transport is developing rapidly and everyone coming back to Hanoi after a certain period will notice it. For many commuters the bus is now a real alternative to the dangerous and often uncomfortable motorbike rides.

In Ho Chi Minh City bus transport has not experienced the same development in recent years, although initial measures have been taken to learn from the example of Hanoi.

Fig. 6

*One of the yellow Hanoi buses in operation.*

Manfred Breithaupt, 2002



The widest consultation of the service development plan should be sought. The public, local interest groups, political organisations and the public transport operators should all participate in the annual planning process and be encouraged to submit proposals for new routes or changes to existing routes. Regulation of Bus Services.



**Fig. 7**  
*Damri's buses are often poorly maintained, although no worse than the private operators in Surabaya, Indonesia.*  
GTZ SUTP, 2001



**Fig. 8**  
*Private bus operators in Belgrade operate without subsidy. The state operator, in contrast, covers only 35% of its costs from farebox receipts.*  
Karl Fjellstrom, Sept. 2002

## Unclear mandates and heavy subsidies for state operators

### Indonesia, Pakistan, Bangladesh, Sri Lanka and Bahrain

Perum Damri (Figure 7) in Indonesia is a state-owned company directly supervised by the Ministry of Communications. Damri operates urban bus services through subsidiaries in 14 of the largest cities in Indonesia. Damri's main task according to its statute is to provide transport services for people and goods, but the company is also expected to act as a 'stabilizer', and 'dynamizer' in the passenger transport sector. It is reimbursed for losses on 'pioneer routes'. A decree of the Minister of Communications in 1987 gave Damri exclusive rights to urban trunk routes, with private buses being relegated to feeder and sub-feeder routes respectively. Although the decree is no longer in force, Damri still enjoys exclusive access to many urban trunk corridors.

In Bangladesh, the state-owned bus corporation BRTC is exempted from all licensing regulations and is heavily subsidized. It is free to operate on any route in competition with the private sector. The Sri Lanka Central Transport Board was 'peopleised' in 1993 after accumulated losses became a political issue. The Punjab Road Transport Corporation in Pakistan was wound up in 1998. At that time it had 10,000 employees and was able to operate only 27 buses of its fleet of 850. The Bahrain Passenger Transport directorate was wound up in 2002 when its cost recovery rate from fares had fallen to 20%.

### Public and private operators in Belgrade

In Belgrade, Yugoslavia (Figure 8), the state-owned operator GSP has a monopoly on tram and trolleybus services, and roughly the same number of buses (around 700) as the private sector operators. The modal share of public transport is 55%, but has declined rapidly in the last decade. Fares are strictly regulated and very low, at a flat 10 dinar (around 0.16 Euro).

The state-owned operator covers only 35% of its costs, and its ongoing subsidy makes up around 70% of the city government's yearly development budget. The private sector operators, on the other hand, operate at the same fare levels and receive no subsidy from the government (GTZ, *Seminar on a Sustainable Urban Transport System for Belgrade*, Sept. 2002).

## 5. Regulation of bus services

### 5.1 Introduction

#### 5.1.1 Definitions

The following definitions are used:

**Regulatory measures** are specific directives, restrictions or prohibitions imposed by legislation or by the authority.

**The regulatory framework** is the broader concept of the full range of incentives, freedoms and regulatory measures where the state/public authority plays a central role.

**The regulatory context** includes not only the framework of rules and measures implemented by the public authority, but the operating environment which contribute to regulate the system behaviour (e.g. markets, operators' associations, non-governmental organisations etc.)

#### 5.1.2 Benefits of competition

In recent years it has been widely recognised that the incentives provided by competition are more effective in promoting efficiency and demand-responsiveness in transport services than directives or direct provision of services by state agencies. This general principle is subject to some reservations:

A recent study (Halcrow Fox for Department for International Development, UK, May 2000) concluded that:

- Competition can be a powerful force for improvement but will only bring the 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 local conditions. Factors in this choice include:
  - 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.

### 5.2 Typology of regulation

A wide variety of market structures and associated regulatory regimes exists in the bus sector, ranging from public or private monopolies to open markets. The DfID study developed the classification in the left column of Table 2. Nevertheless it is recognised that these different regimes can exist in the same location for different modes, e.g. there may be an unofficial or unregulated market for paratransit in parallel to the formal network.

This classification combines the three concepts of:

1. regulatory strategy;
2. market type;
3. access to the market and means of procurement.

**Table 2: Classification of markets and competition**

Classification	Degree of Competition
Monopoly	No competition
Management contracting Gross cost service contracting Net cost service contracting Franchising Concessions Quantity licensing Quality licensing	Controlled Competition
Open market	Open Competition

For the purpose reviewing options in this module a simplified three-way classification (shown in the right column of Table 2 is used, based on the degree of competition:

#### 5.2.1 No competition

The following refers to a closed market. Responsibility for providing transport services is vested in a single operating undertaking either a private company (e.g. Singapore Bus Services in Singapore 1973-1984) or more commonly a public sector agency which plans and directly operates the services (e.g. London Transport pre-1985, Bangkok, many cities in Germany and the USA, Bucharest, Vienna, many Chinese cities prior to the first bus joint ventures in the 1990's, most CIS cities). Many of the characteristics of monopolies are shared by oligopolies. The monopoly model was very common prior to the 1980's.

## The role of motorcycles in developing countries

Small motorcycles in developing countries offer a high level of service (no waiting time, high door-to-door travel speed) and low cost that is very difficult to match with any form of public transport. In Bali, Indonesia in 1999 the modal split for motorised trips was motorcycle 76%, car 20% and bus 4%. In Hanoi Vietnam in 2003, buses carried less than 10% of trips, while motorcycles' share was about 80%. The key policy challenges in these cities is to transfer trips from motorcycles to public transport and slow the rate at which motorcycle users upgrade to private cars.

Monopoly is both an industry structure and a state of no competition. The DfID study concluded that:

*Public monopolies are, almost always, less efficient than competitive regimes. This results from a combination of political interference, poorly incentivised management, the power of organised labour and social and other obligations. Not all these are at work in all public monopolies and their extent varies but, almost without exception, they are present in sufficient degree to result in a significant efficiency deficiency compared with a well-chosen alternative competitive regime. Public monopolies however have the advantage of closer authority control over services and fares. This can make integration and attention to social and other wider community needs easier to achieve. But even this requires a coherence of purpose and action within the public sector that is all too often missing. In the case studies and literature research we have not found any examples where a pure public monopoly offers a superior alternative to the best-designed competitive arrangement.*

However, a monopoly of bus transport provision is not a monopoly of urban passenger transport provision. There will be competition between buses and other public transport modes (rail passenger ferry) and, if a monopoly fails to deliver adequate services, it creates an opportunity for informal paratransit operators to enter the market. Once established, paratransit offers very effective competition against a complacent public sector operator and is very difficult to control or limit.

Most importantly, there will also be competition between public transport and non-motorised modes (walk and bicycle) and motorised private modes, particularly motorcycle and private car. The DfID study concluded that internal competition between public transport providers was more effective in promoting service improvements than competition with private modes.

### 5.2.2 Controlled competition

Competition may be controlled in two ways:

- for the market: an operator is awarded an exclusive right to provide services. Competition is generated for the award of the exclusive right.

- in the market: operators compete for passengers, complying with certain rules of competition.

There are many cases where competition occurs both for the market and in the market, for example where a limited number of operators are awarded operating rights and subsequently compete for passengers.

In either case, a competent authority is required to control the competition: to manage the competitive process for award of the exclusive or non-exclusive operating right and in the second case to set the rules governing 'on-the-road' competition.

### Developed cities

In most developed cities, controlled competition is *for the market*, i.e. the competition is for the right to operate. This is because urban transport in developed cities is almost always heavily subsidised and the competition for the market is determined in favour of the operator requiring the lowest amount of subsidy to provide the fixed level of service specified by the authority. Once the principle of each mode recovering its costs from fares has been abandoned in favour of integration, the way is open for pricing of services using economic rather than cost-related criteria.

The strategy of competition for the market has been adopted, with varying degrees of sophistication, by many cities in developed countries e.g. cities of the EU including London, Dublin, Copenhagen, Stockholm, Helsinki; also cities in Australia and New Zealand and the USA.

The administration of a fully integrated system and a regime of controlled competition demands quite high professional capability and a sound legal basis. High standards of transparency, integrity and fairness are necessary if operators are to have confidence in the award process.

### Developing cities

In the cities of the developed world, transport planning and regulatory capacity is strong but competitive forces are rather weak. In the cities of the developing world the opposite applies. Indeed, the successful implementation of a strategy of controlled competition is almost a defining characteristic of a developed city.

Relatively few developing cities have introduced competition for the market. Some attempts

have been made, with mixed results due to problems in the design or execution of the tender process, and in the subsequent supervision of the contracts. Even so, effective competition in the market is also uncommon in developing countries because of lack of sophistication in the regulatory framework and the low capability of institutions. There are many constraints on producing effective competition in the market, as bus operators tend to organise themselves to deter the entry of newcomers, or even incursion by other modes, into their routes and territories. The response of the regulatory authority in such cases is often to defer to the route organisations, using them as intermediaries. Attempts to challenge the power of monopolistic operators' associations are rare, and can provoke determined resistance.

**5.2.3 Open market (deregulation)**

In an open market, any qualified operator who meets specified organisational and safety criteria is free to operate any service at his discretion. The most well-documented example is in the UK cities outside London.

There are few examples of deregulated bus industries in developing countries ie cities where the authority takes measures to ensure the openness of the market. There are, however, many examples of ineffectively regulated bus industries.

**5.2.4 Regulatory vacuum**

If government does not have clear policies, priorities and procedures, decision-making tends to become *ad hoc*, with every issue having to be negotiated with the various interested groups.

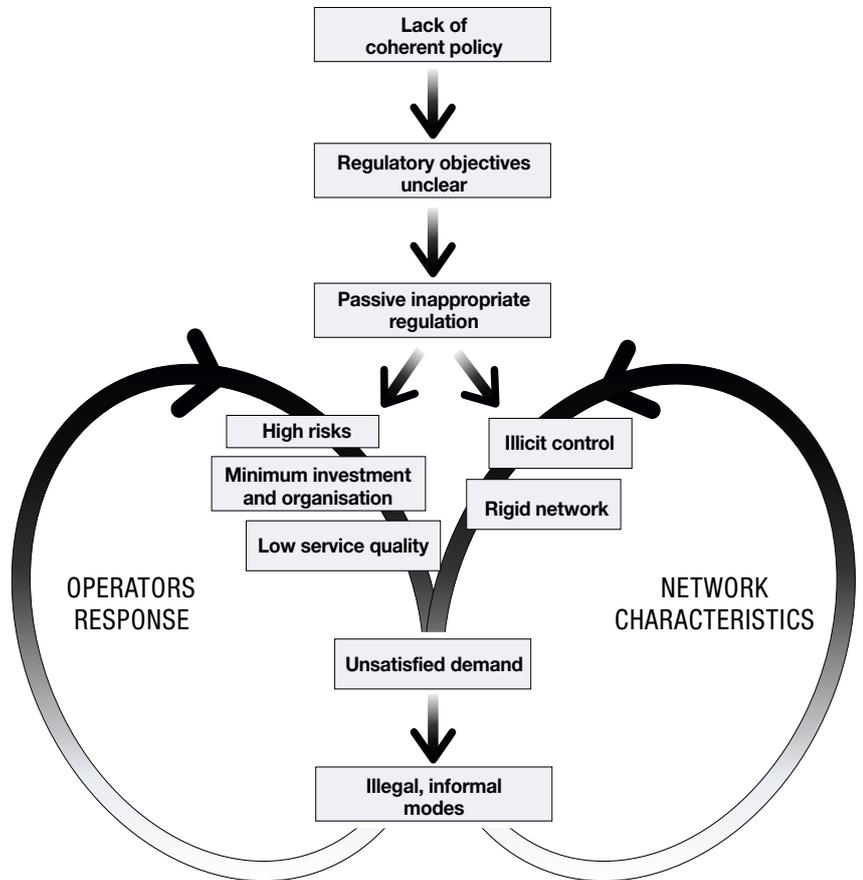
The absence of guiding principles creates a 'regulatory vacuum' within which operators may assume rights, which then become entrenched, and which they defend. Even illegal operators who have become established in gaps in the market created by the inflexibility of the system to respond to changes in demand, claim operating rights.

A regulatory vacuum also encourages operators of the various transport modes to consolidate into trade associations, often lead by an influential 'strong man', whose main objective is to protect members' interests against unfavourable initiatives. They also tend to impose illicit control and charges on the operators.

Such organisations may claim to be legitimately representing the operators' interests, and in some respects (for example by controlling access to a mode, route or district) they do. Due to their large membership and tendencies towards militancy, these organisations often have considerable power, and ultimately may have more power than the regulator. This power may be enhanced by 'regulatory capture' (where for example, some of the proceeds from illicit charges and extortion flow to the regulators, who then have a vested interest in maintaining the illicit system). Ultimately, the operators may have a power of veto, exercisable through strikes or demonstrations. Use of this veto, or anticipation that it may be used, tends to produce indecision by the authority or a reluctance to take any initiatives.

A regulatory vacuum results in frequent confrontation, both between the authority and the industry, and between different groups of operators. Negotiating or avoiding these conflicts can consume much of the available regulatory staff resources, diverting them from systematic

**Fig. 9**  
*A 'vicious cycle' illustrating how ineffective regulatory institutions can create a high risk / low cost / low quality equilibrium in the public transport industry.*  
 Louis Berger Inc., 2002



### Call for reform

The state-owned Punjab Road Transport Corporation in Pakistan reached a point in early 1997 where only 27 buses of its fleet of 845 was fit to operate, but it had more than 10,000 staff on its payroll. The staff were retrenched with World Bank assistance at a cost of PKR 2 billion.

monitoring and planning. It also means that minor decisions (such as the change of a route which affects other routes) tend to be escalated to the top levels of the authority. Negotiation of issues between the authority and the operators tends to take little account of the interests of the users. Ad hoc regulation is essentially reactive. Issues are addressed only when they are big enough, or contentious enough, to rise up the agenda. There is a tendency to resort to expedient and compromise solutions - to treat the symptoms - which perpetuates the ad hoc regulation. Ad hoc regulation results in a very slow rate of change. Often the 'balance of power' between the operators and government is in the operators' favour. The cycle of lack of a clear regulatory policy, inappropriate regulation, illicit control, leading to unsatisfied demand, generation of illegal modes, and a perpetuation of poor services and low investment is illustrated in Figure 9.

### 5.3 The role of the authority

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.

Under the 'no competition' model a supervisory body is required to ensure that operators meet certain general standards of service coverage, performance and quality. However, in a private monopoly the authority may have no effective recourse if the standards are not met since the incumbent operator will be difficult to replace in the short term and will often blame his shortcomings on deficiencies in the regulatory or operating environment. In the absence of a comparison, the authority will tend to accept these uncritically. This may discourage planning initiatives by the authority.

In the case of a public sector operator the supervisory body is likely to be 'under the same roof' as the operator (usually a department of city government) and not fully independent. There may also be a supervisory board.

A monopoly has weak incentives to control costs and the supervisory agency may have the task of presenting demands to the government to fund ever-increasing operating deficits. Government

itself may contribute to these deficits, for example by promoting over-staffing. Government may be unwilling to increase fares to the level of cost-recovery for political reasons. This is a 'slippery slope' down which many government monopoly bus undertakings have slid. The decline may reach extreme levels before the imperative for reform is recognised.

Under controlled competition 'for the market' the authority will be responsible for the planning and development of the whole public transport service, including all the modes, perhaps down to the level of operating timetables.

The authority's tasks will include:

- planning of transport infrastructure and technical systems (such as information and ticketing systems);
- defining each route in the network and specifying the service parameters;
- procuring services through tendering and contracting, and the management of those contracts;
- resolving coordination issues between operators;
- monitoring the operator's compliance of each route contract;
- monitoring the overall network against demand;
- fare-setting.

For these tasks, a comprehensive transport database needs to be established and maintained.

The authority will also be the government's main advisor on public transport policy. It will recommend service standards including capacity and quality, environmental standards, fares, vehicles and labour conditions.

Under an open market the authority's main responsibilities will be to ensure that competition remains effective, and to maintain and enforce minimum safety and environmental standards for operators and buses. The role of the authority will not include comprehensive planning of the network and services - this will be done by the operators in the market. A system of registering routes and buses deployed will enable the authority to monitor the network. The authority may have responsibility for procuring any services that the market is unwilling to provide. This will be done through tendering and contracting.

## 5.4 Factors defining regulatory regimes in developing and developed cities

As noted above, there is a clear divide between developing cities and developed cities and in respect of the basic characteristics of their public transport systems. These determine their regulatory frameworks.

The defining features of public transport in developing cities are:

- there is no subsidy, except that public sector undertakings may be subsidised by payment of their deficits *ex post*, i.e. their deficits are paid from public funds. Private sector modes typically cover their full costs from fares. There are several reasons:
  - most developing cities rely heavily on low-cost, low-quality paratransit systems which achieve cost recovery despite the affordability constraints of users. Paratransit modes fill gaps in the quality range, network coverage or capacity of formal modes;
  - the administration of subsidies requires sophisticated administrative mechanisms to ensure they are allocated efficiently and agencies are accountable. Developing city governments often lack this level of capability;
  - subsidies are most easily applied to large corporate transport undertakings which have accountable and responsible management, whereas the individual sector dominates in many developing cities;
  - developing city governments often lack sufficient funds to subsidise transport, because there are higher priorities for the use of public funds.
- there is relatively little integration of routes, modes or fares;
- the regulatory framework does not impose service obligations on operators. This is often because regulatory authorities lack the capability to plan networks and enforce service obligations. Regulation tends to be permissive - a vehicle is licensed to operate on a route and the main incentive to operate the vehicle is the operator's incentive to generate revenue. There is no sanction for failing to operate. Route and capacity changes tend to be incre-

mental, and usually in response to pressure from the public or the operators.

- competition in the market is generally not effective despite the presence of multiple operators because of restrictive regulatory measures by government and restrictive practices by associations of operators which restrict access to routes and terminals. Where competition does exist in paratransit, it tends not to create incentives for service improvement. Creating competition in the market or for the market, requires an effective planning and regulatory capability, at least to impose some service obligations and develop minimum timetables. Where public sector operators are present, they tend to have commercial advantages and there are often regulations that protect them from competition;
- low institutional capability limits the scope of regulatory functions and creates difficulties in imposing regulatory measures on the informal sector; regulation is often limited to issuing permits and collecting fees.

The characteristics of transport systems in developed cities are:

- transport is subsidised; the cost of public transport is high, commensurate with its high quality. There may be procedures to ensure that the best value for funds expended on subsidy is obtained;
- service quality and reliability is high to achieve the objectives of diverting trips from private vehicles, providing equality of mobility to disadvantaged members of society while meeting high environmental standards., not constrained by fares;
- there is a high degree of integration between modes, routes and fares; a common tariff and/or common ticket system may be adopted. Either the authority collects and retains revenue or an arrangement for distributing revenue between operators is in place;
- there is an absence of informal paratransit modes;
- operators are subject to service obligations;
- there is an effective transport authority with a highly sophisticated capability for planning, service procurement and monitoring, directed by a supervisory board whose powers and duties are defined by statute;

## Stages in the development of Singapore's public transport system

Singapore's public transport system was characterised as a 'developing' system in the 1970's with a monopoly bus operator SBS providing poor services, supplemented in peak hours by school and contract buses under a 'supplementary scheme', analogous to paratransit. Regulation was by the Ministry of Communications.

In 1987 the first MRT line opened and to facilitate integration a statutory Public Transport Council (PTC) was established in 1987 with responsibility for authorizing bus routes and fares for buses, taxis and MRT. In 1989 Transport Link Ltd. (TL) was established, with investment capital contributed equally by SMRT, SBS, and TIBS to undertake integrated bus route planning and manage the common ticketing system. These developments put Singapore in the 'developed' city transport system category. Exceptionally however, public transport was not directly subsidised, except in respect of infrastructure costs.

Integration continued with the establishment of the SLTA in 1995, the rationalisation of bus routes to complement the successive extensions to the MRT and LRT network (which comprised 95 stations by 2003) and the universal 'ez-link' smart-card fare collection system introduced in 2002. These aim to enable seamless journeys through the network.

Uniquely for a highly developed urban system, transport subsidy in Singapore remains confined to capital and infrastructure costs (which includes tunnels, viaducts, stations, signalling system and the first set of trains on new lines) albeit that the amount of subsidy is huge given the construction of 128 kms of metro and light rail in the last twenty years. Operating costs are covered by fares.

The 'duopoly' in provision of bus services (by SBS and TIBS) was reaffirmed by the 1996 transport policy paper on the grounds of stability and the potential for supporting unprofitable bus routes by internal cross-subsidy. The government claims the two bus operators compete 'in terms of efficiency, cost-effectiveness and service levels', and states that Singapore will not move towards more intensive competition in the bus market, nor competition for the market. (A World Class Transport System. White Paper. Singapore Land Transport Authority 1996.)

- there may be a public sector monopoly operator.

The characteristics of the highly developed system can be recognised as the model envisaged in the European Union draft regulation on transport described in the next chapter.

Given these characteristics, it is possible to classify cities by the stage of development of their transport systems, and also to identify the stage at which a transport system has made the transition from one category to the next. The example of Singapore is described below.

## 5.5 Implementing controlled competition

There are two sets of issues in the design of a strategy of controlled competition:

- the regulatory strategy;
- access to the market: the means of procurement.

### 5.5.1 Regulatory strategy

Public transport in most European, North American, Australasian and former communist cities has been operated by public sector monopolies. There is now a strong trend towards controlled competition in the form of contracting out the supply of transport services to multiple suppliers, with the contracts conferring an exclusive right for a term of years. The trend has been reinforced by the draft EU regulation described later.

Relatively few developing cities have adopted competitively bid contracts, though several South American countries have made initiatives.

### *Forms of contracts*

A variety of contracting strategies is available including:

- management contract, where the authority owns the assets;
- service contracts: either 'gross cost' or 'net cost'.

### *Service contracts - gross cost or net cost*

Under a 'gross cost' contract, all the revenue accrues to the authority, so the revenue risk falls on the authority. The operator has to consider only the cost of providing the contracted service, which can be estimated with some accuracy.

## Bus franchises in Hong Kong

The Hong Kong government Website provides an overview of the public transport franchising system in Hong Kong.

Adapted from <http://www.info.gov.hk/info/franchis.htm>, updated Oct. 2002

Bus franchises have been awarded through tender since 1991. The franchised bus companies face keen competition from other transport modes, including railways and public light buses. In the first half of 2002, franchised bus companies carried 39.1% of the public transport trips made each day.

There are five bus companies and one ferry company operating under the franchised system - KMB, NWFB, New Lantao Bus Company (1973) Limited (NLB), Citybus (operating two franchised networks), LW and "Star" Ferry Company Limited (SF). Two Government-appointed directors sit on the board of each of these companies.

To make their operation more transparent, we require the franchised operators to publish periodically booklets disclosing financial and operational information to the public. Franchised companies are also required to submit five-year forward planning programmes annually to the Commissioner for Transport for approval. For bus companies, these programmes include route development programmes for the first two years and these programmes will not be finalized until the relevant DCs have been consulted. The franchised operators are also encouraged to publish performance pledges and service charters, improve their route information services and strengthen their customer relations services. All franchised transport companies have established passenger liaison groups to interact directly with the public for the purpose of assessing and improving service standards.

If contracts are 'net cost', i.e. the operators base their bids on the expected revenue for the route, plus the amount of subsidy (if any) required to fully cover their costs. Bids will include a premium to take account of the risk that the forecast revenue will not be achieved in practice. In London tenders, where passenger demand for the routes was well established, it was noted (The London Bus Tendering Regime – Principles and Practice. Toner JP. 7<sup>th</sup> International Conference on Competition and Ownership in Land Passenger Transport. June 2001) that costs to the tendering authority were about 10% per bus km cheaper for gross contracts than for net contracts.

In a city such as Hanoi, Vietnam, which does not have an extensive network of bus routes, basic data such as potential passenger demand in particular corridors and elasticity of demand in relation to fares have to be estimated from empirical data. The accuracy of such predictions depends on the quality of input data and it could be expected that bidders would add a risk premium for 'net cost' contracts of about 20-30%.

Thus, gross cost contracts are cheaper for the authority in an environment where reliable demand data is not available.

Gross cost contracts involve a risk to the authority that the operator does not transfer, or account for all revenue to the authority. However, where a large proportion of revenue is received off-bus directly by the authority (for example, by sale of stored value tickets, passes, monthly tickets, tickets by machines at stops and retail outlets) this risk reduces.

Net cost route contracts offer the potential for competition in the market, though price competition will be reduced where integrated fares and ticketing are adopted.

In deciding whether to adopt net cost or gross cost contracts, the cost of leakage of the proportion of fares paid in cash on a gross cost contract must be weighed against the additional revenue risk premium which a bidder might add to a net cost contract. In London, a mix of gross and net contracts was used for different route packages.

**Fig. 10**  
*Franchising was successfully used to introduce competition in bus services in Hong Kong.*

Karl Fjellstrom, 2001



**Table 3: A wide range of possible competitive arrangements for bus services.**

Arrangement	Characteristics
Public monopoly	Authority owns and operates system
Management contracting	Authority owns system, hires management
Service contracting:	
- gross cost	Revenue goes to authority, bidders compete for production cost
- net cost	Revenue goes to operator, bidders compete for cost and revenue
Franchising	Authority may specify some parameters of the service
Quality licensing	Any operator who meets quality criteria can operate
Quantity licensing	Limit on number, enough to generate competition
Open market	Free entry, with a few basic rules

### *Quality contracts*

A frequent criticism of gross cost contracts is that the operator has no incentive to attract additional passengers by service enhancements because his income is independent of revenue. Even in net cost contracts the incentive to attract additional passengers is weak. To overcome this disincentive, quality contracts have been adopted in a few countries (Norway, Australia, New Zealand).

A quality contract is a form of incentive contract, which aims to obtain the best possible service for users at a given subsidy level. Such contracts use well-defined and clearly predictable performance measures to achieve a more customer-orientated services, better long-term service planning and better integrated regional networks.

Quality contracts are flexible and, unlike competitive tendering, do not need fixed durations. Quality contracts tend to strengthen market incentives and reduce contract negotiation costs as long as the need to re-negotiate contracts is relatively infrequent. Under the contract, the operator is required to collect data from users on their perceptions of service quality which is used to measure customers' perceptions of performance. The most important parameters will be travel time, information about the service at the stops and on the vehicle, fare level and the discount structure.

In addition, the public transport authorities can use tendering as a threat to discipline the firm if the specified service level is not achieved.

A trial of quality contracts was carried out in Hordaland County, Norway between 2000 and 2003 (Experiences with Quality Contracts in Public Transport in Norway'. D M Berge, S Bråthen, O Hauge and F Ohr. 8<sup>th</sup> International Conference on Competition and Ownership in Land Passenger Transport. 2003). The evaluation showed that operators responded to the incentives, and that users reported significant improvements in service quality.

### *Patronage incentive contracts*

An alternative method to overcome the disincentive to attract additional riders under a gross cost contract is the use of a patronage incentive contract under which the operator receives additional payment for attracting extra passengers. Patronage incentives are only feasible when demand has stabilised and incremental increases in ridership can be measured.

### *Route or area contracts*

A contract may govern the operation of a single route; or it may confer an exclusive right to provide all 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 be realized only if the operator has an incentive to increase bus patronage, i.e. the contract is on a fully commercial, or a net cost basis.

A major advantage of a single contract covering an area is that it enables a transfer of responsibility for planning and designing the route

## Licensing and regulatory reforms

Adapted from GTZ SUTP, 2001

The current licensing system in many developing cities, where no person or organisation is responsible for ensuring an adequate public transport service on a particular route, is a fundamental problem of public transport.

The regulators should either deregulate bus service (which it is not anticipated they will do), or alternatively plan and regulate it effectively. To carry out this planning and regulation they need staff and skills to monitor the performance of public transport. If the service provided to the public is unacceptable, they must be prepared to make changes. In this regard it is clear that the common procedure whereby several operators hold route licenses for the same route, and under which the license allocates particular buses to particular routes for the duration of the route license, must be ended. Each route must have one operator who is responsible for ensuring the implementation of an acceptable service on that route. This requires a fundamental change to the licensing procedures in that an operator – that is, an individual, a company, a consortium or some other legally accountable body – must be the licence holder.

The operator of the route would be required to provide a “satisfactory” service and this could involve defining a number of key service parameters which could include the following:

- Departure times of the first and last buses
- minimum peak number of buses in service
- capacity of the buses to be used
- headways to be provided by time of day
- minimum peak hour capacity by direction
- total daily trips
- maximum peak occupancy
- vehicle specifications including engine position, seating, a/c, floor height, maximum legal capacity including standees, aisle width, cabin height and number of doors.

All these measures relate to the quality of service from the perspective of the passenger. The precise conditions may be altered by mutual agreement between the operator and the licensing authority in line with changing circumstances. This is very important. As the objective is to increase the number of passengers on the routes, it is essential that either more buses are added or larger buses are employed as the passenger numbers increase. While the operator should be free to add buses as long as the minimum conditions are met, the licensing

authority should also retain the right to ask for improved service if it believes that the operator is not responding adequately to increased demand.

While the above measures are concerned with the obligations of the operator, it is important that the agreement makes it clear that fares, if controlled by the regulator, must be allowed to rise such that the operator can cover all legitimate operating costs including depreciation and interest charges, and also have a reasonable return on investment.

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*“The common procedure where - by several operators hold route licenses for the same route, and under which the license allocates particular buses to particular routes for the duration of the route license, must be ended.*

*Each route must have one operator who is responsible for ensuring the implementation of an acceptable service on that route.”*

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The operator must also be required to report performance to the authority on a regular basis. The agreement between the operator and the regulator must contain some provisions for the regulator to take action against the operator if the service is not being provided as specified. Ideally this should be incremental, such that first offences receive small fines while persistent and serious breaches of the agreement can result in the loss of the route.

No special licence should be required for the bus, and no payment other than the normal vehicle registration fee should be required. Every effort should be made by the Government to ensure that the cost of the service is kept to a minimum. Taxation on the provision of normal public transport service should be kept to an absolute minimum.

### Change of operator

When Hong Kong replaced China Motor Bus with New World First Bus in 1998, CMB was required to sell part of its fleet, and transfer the lease of two depots to the incoming operator. One of the tender criteria was that bidders should have a robust plan for the transition.

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 basis) is likely to be sensitive to demand and thus more likely to produce a service well-matched to demand than the plans produced by the authority under a system of multiple route contracts.

Large, area operators may benefit from some economies of scale and greater operational efficiency, for example by inter-working buses on several routes, incurring lower 'dead mileage' between the depot and terminals and by implementing route and fare integration. An area operator may also be held accountable for any service deficiencies in their area. Where a payment is required, a higher bid may be expected for area contracts than for multiple route contracts, thereby producing more revenue for the authority. Also, because multiple route contracts will generate more competition in the market, creating a revenue risk for operators under net cost contracts, this is likely to be reflected in a 'risk premium' in bids and higher contract costs to the authority.

Partly because of the larger investment required for an area contract, and partly because of the emphasis on developing an area market and building patronage, area contracts will normally have longer durations than route contracts (e.g. 7-10 years compared with 4-7 years). This will reduce both the frequency and the number of tenders compared with multiple route contracts.

Although competition in the market may be limited to zones where area contracts overlap, or where incursion into a contract area zone is permitted, these may be structured to promote competition.

There are also some disadvantages of area contracts. Dependence on an area operator may be high. The practical problems of replacing an area operator will be greater than a route operator due to the large size of the initial investment and the strong position of the incumbent operator. There is a risk of disruption to services in the event that an area operator is changed.

Table 4 summarises issues and options in the design of bus franchise contracts.

### *The EU policy on controlled competition*

Controlled competition is the 'middle ground' between monopoly and an open market. The tendering of exclusive rights to routes or networks of routes, for a limited period of time gives operators some freedom to respond to market conditions, while enabling them to develop a market for their services, thereby encouraging investment. Public service requirements, such as affordability, accessibility, network integration and common fares and ticketing can be met. Usually, a transit authority in city government plans the services to be operated, undertakes the marketing and promotion of services and ensures that services are fully integrated.

The European Commission has recognised that this strategy, of applying competitive pressures in a controlled manner produces lower operating costs whilst generating incentives for service quality improvements. Service quality is regarded as particularly important as a high proportion of bus users in the EU have the option of private car use.

Table 5 is presented by the EC to support its proposed regulation. The data is derived from an analysis of public transport trends in 30 large EU cities during the 1990's. It compares the effect on ridership and cost-recovery from fares, of the three main regulatory strategies described above:

- no competition;
- deregulation, as in UK outside London;
- controlled competition— tendering out exclusive rights.

Controlled competition through tendering out exclusive rights has led to both an increasing number of passengers and higher cost recovery from fares.

In the light of these conclusions, a draft EU regulation has been drafted which has been under discussion for several years to introduce more public service contracts for transport services. These contracts will confer an exclusive right for a limited period of time and a limited service area and should be awarded in open competition.

The key elements of the draft EU regulation are as follows:

**Table 4: Franchise scheme design – a summary of issues and options.**

Franchise scheme	Usual practice with small-scale bus franchises
Basis for determining number of operators	<p>Principles of ‘regulatability’:</p> <ul style="list-style-type: none"> <li>■ multiple licences for each route difficult to regulate;</li> <li>■ ‘one licence, one route’ enables franchise to include service obligation;</li> <li>■ in a big city, routes should be franchised in areas or packages to promote efficiency;</li> <li>■ small package size means easier replacement of operator and enables shorter contract duration.</li> </ul>
The basis of the operating right	<p>Options:</p> <ul style="list-style-type: none"> <li>■ a departure slot or daily ‘running number’;</li> <li>■ a route;</li> <li>■ a group of routes or a local network;</li> <li>■ an area..</li> </ul>
Design principles of areas / route groups	Separate, to confer responsibility service obligation, or overlapping to promote competition
Service planning roles and responsibilities between the operator and the authority	Route franchises normally require network planning by the authority. Area franchise may impose responsibility for network planning on franchisee.
Service specification by government	<p>Government may specify:</p> <ul style="list-style-type: none"> <li>■ all service parameters (route, number, type and quality of vehicles, maximum fare, operating period, frequency);</li> <li>■ no service parameters (if individual route permits);</li> <li>■ maximum and minimum service parameters;</li> <li>■ minimum service parameters only.</li> </ul> <p>Franchisee may have some freedom to exceed service parameters.</p>
Contract duration	<ul style="list-style-type: none"> <li>■ 3 years for minibus;</li> <li>■ up to 10 years for big buses;</li> <li>■ up to 20 years if requires infrastructure investment and development.</li> </ul>
Exclusive or non-exclusive rights	<p>Franchises may confer exclusive right to the route, terminals, or stopping places.</p> <p>Exclusive route and area franchises normally include service obligations.</p> <p>Competition may still occur on common route sections.</p> <p>Exclusive area franchises must allow some incursion for operational reasons.</p>
Criteria for subsidies	<p>Subsidy may be warranted by wider economic and social objectives, especially where reducing car use is an objective, but there are strong arguments for setting fares at cost-recovery level where possible.</p> <p>A subsidised system involves greater administrative complexity and accountability.</p> <p>Subsidies should be targeted to needy users, not applied by default.</p>
Treatment of ‘incumbent’ operators	Individual operators may oppose reforms, they should be invited to consolidate into route organisations and apply for franchise.
Policy regarding provision of buses	Buses normally provided by franchisee except where management contract.
Policy regarding provision of depots	<p>Depots involve major investment, long construction time, and problems of land availability: require long franchise tenure, at least ten years.</p> <p>If depots provided by government, franchise tenure may be shorter, easier replacement of operator.</p>
Policy regarding provision of route infrastructure	<p>Shelters may be provided by government, franchisee or third party agency.</p> <p>If operators share facilities on short franchises, government should own infrastructure.</p>

Franchise scheme	Usual practice with small-scale bus franchises
Criteria for tendering / contract award	Selection criteria will vary with government objectives. Options: <ul style="list-style-type: none"> <li>■ quality of service;</li> <li>■ level of fares;</li> <li>■ amount of payment or subsidy;</li> <li>■ level of investment.</li> </ul>
Criteria and procedures for extension or renewal	If subsidised contract, re-tender on expiry. If not subsidised, renewal subject to compliance and satisfactory performance.
Payments for franchise	Payment amounts to a charge on users, so normally no payment is required. Proceeds of payment may be used for cross-subsidy from profitable to unprofitable routes.
Performance monitoring by authority	Degree of monitoring depends on extent of service obligations. Where competition is muted, monitoring is more important and penalties form important part of operators incentives. Franchise should include obligation to submit operating data to authority. Authority should conduct monitoring program.
Sanctions	Procedures to be fair, with due notice and opportunity to make representations. Penalties to be cumulative, with minor infringements incurring points towards fines and loss of exclusivity. Ultimate sanction for serious, repeated offences may be early termination of contract. Performance bond may be appropriate at start-up.

**Additional provisions for subsidised operations**

Revenue risk	With operator (net cost contract) With authority (net cost contract)
Mitigation of revenue risk	Adjustment of contract for changes in input costs
Criteria for contract award	Normally the objective is to obtain the best value for subsidy funds so the bid which meets quality standards and offers the lowest subsidy will win.
Revenue risk	With operator (net cost contract) With authority (net cost contract)
Mitigation of revenue risk	Adjustment of contract for changes in input costs
Criteria for contract award	Normally the objective is to obtain the best value for subsidy funds so the bid which meets quality standards and offers the lowest subsidy will win.

- requires authorities to secure adequate, demand-responsive transport services that are of high quality and reasonably priced, providing integration, continuity, safety and available to all groups in society;
- specifies conditions under which authorities may compensate transport operators for the cost of fulfilling public service requirements and under which they may grant exclusive rights for the operation of public passenger transport;
- obliges the use of public service contracts if payment of financial compensation for the cost of complying with public service requirements, or the award of exclusive rights, is involved;
- prescribes that contracts shall be awarded by competitive tender by fair, open and non-discriminatory procedure and will last no longer than eight years for bus services;
- public service contracts may be awarded directly if they have an estimated average annual value of less than €1 million, and if all public service requirements are incorporated, an estimated average annual value of less than € 3 million;
- authorities may decide not to award a public service contract to any operator that already

has or would, as a consequence, have more than a quarter of the value of the relevant passenger transport market.

Under the EU principle of subsidiarity (i.e. regulations should be administered at the lowest practical administrative level) it will be left to individual countries, depending on national objectives, to determine the way the principles should be implemented and the roles and responsibilities of the authorities and operators. The proposed regulation will not preclude any of the three broad strategy options described above, but it will be influential in determining the strategy.

### 5.5.2 The means of procurement

Competition for the market usually involves the authority specifying the services and supporting organisation and infrastructure to be provided, then inviting potential operators to make proposals against those specifications. The bidder offering the bid that best meets the selection criteria wins the tender.

An outline of tender procedure is shown in Figure 11. The procedure is in two parts:

1. pre-qualification: only bids meeting the minimum requirements will proceed to evaluation;
2. evaluation of the bid.

The pre-qualification stage is to determine that a bidder meets the minimum requirements to operate a bus service safely, efficiently and reliably. Criteria will include the bidders corporate experience in transport, number of qualified staff and financial resources in relation to the

**Table 5: The effect of different regulatory strategies on public transport performance.**

Regulatory Strategy	Annual change in passenger trips	Annual change in proportion of operating costs covered by fares
Cities with no competition in public transport	- 0.7%	+ 0.3%
Cities using deregulation without significant role by authorities	- 3.1%	+ 0.3%
Cities using controlled competition	+ 1.8%	+ 1.7%

Source: The amended proposal for a Regulation of the European Parliament and of the Council on action by Member States concerning public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterways)

scale and complexity of the operation. If the bidder satisfies the minimum standard for each parameter he will pre-qualify and the bid will proceed to the evaluation stage.

#### *Developed cities – getting best value for money*

It was observed in paragraph 5.4 that a characteristic of public transport systems in developed cities is that they are subsidised and it is usually a policy objective to get the best value for the funds expended on subsidy. This means that the selection criterion can be a simple and easily quantifiable one: the bid which offers to operate the services required for the lowest amount of subsidy. This is the basis of the draft EU regulation.

An alternative criterion for value for money would be the bid which offers the most service

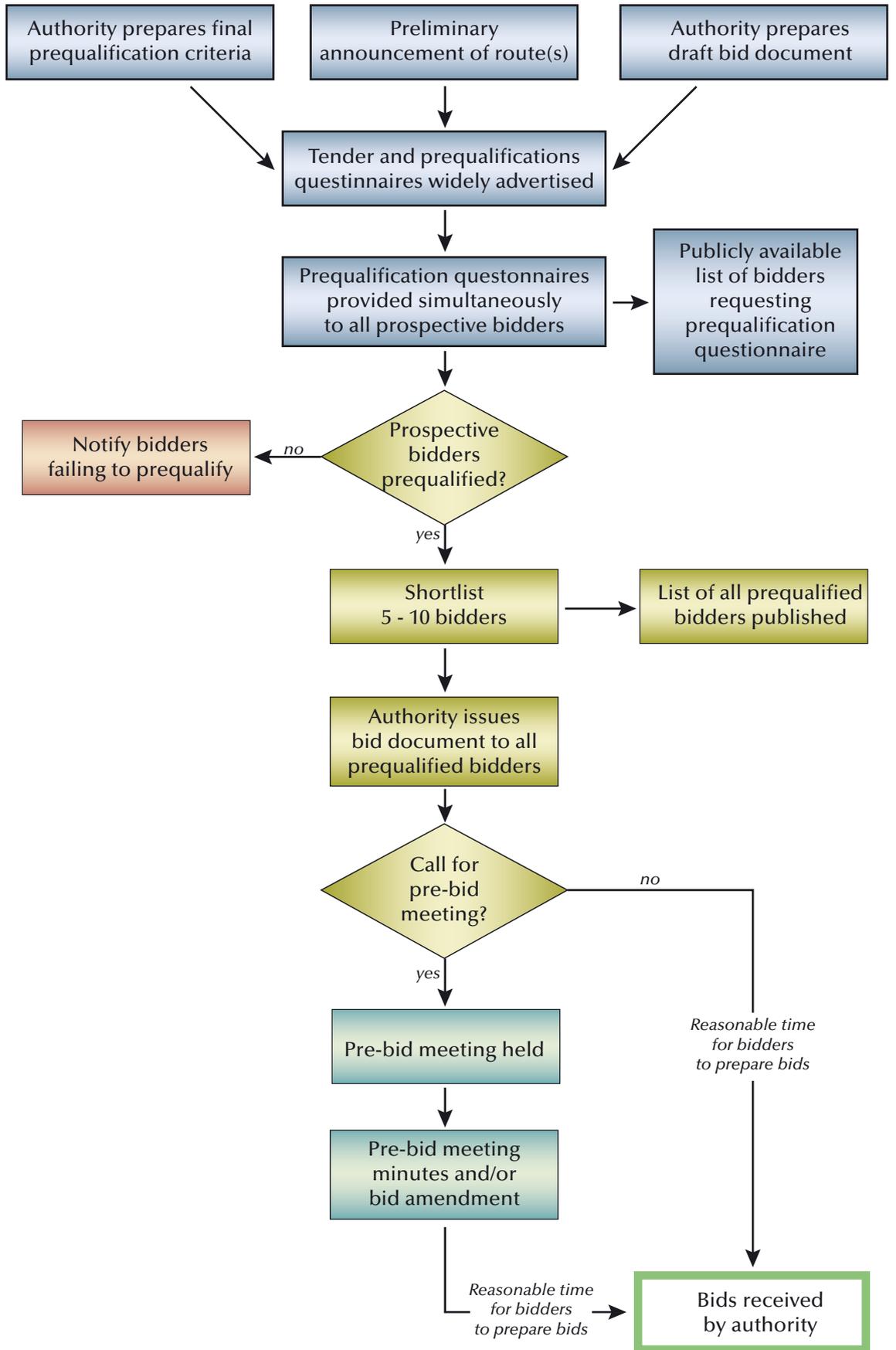
**Table 6: Operators’ risks and strategies to reduce them.**

Risk	Strategy to Reduce Risk
Tender unfair, not impartial	- Transparency - Strict observance of tender procedures - Avenue of appeal against result
Adverse impacts of regulatory actions after award of licence	- Minimise scope for intervention by regulator - Regulation to be within policy framework - Obligations and freedoms to be defined in licence
Fare increases constrained	- Fare review process to be defined in licence - Cost-based procedure, not politicised
Falling demand for public transport	- Gov’t policy to promote public transport development
Poor operating conditions	- Traffic management to favour public transport - Better terminal management
Unpredictable reactions by microbus and other operators	- Consult with the other operators - Later extend tenders to other routes
Illicit payments	- To be eliminated, or formalised, transparent - Formal regulation to displace informal regulation

#### **Regulatory risks**

Regulatory risks can be defined as commercial risks borne by the operators that are affected by the exercise of regulatory powers, such as the restriction of fares to uneconomic levels, or the maintenance of levels of service that are not warranted by demand. Table 6 provides a summary of regulatory and other risks, and strategies to overcome them.

**Fig. 11**  
*Steps in the tendering process*



To enjoy a real prospect of success the scheme of tendering should be introduced, not in isolation, but in a supportive environment of policy and institutional changes. The following sequence, **in advance of the first tender**, is suggested:

- Policy** Obtain political consensus on policy objectives, including the operators and other interests likely to be affected.
- Authority** Define the regulatory regime. Specify necessary planning and regulatory powers and procedures. Vest licensing powers initially in the city- or metropolitan-level regulator. Specify the constitution of the Authority to be formed later. Empower the Authority with regulations to discharge its functions.
- Resources** Ensure the traffic and transport office, and other departments of the municipal government, have sufficient resources (finance and qualified staff) to provide support to the Authority.
- Plan** Draft the first 3-year public transport plan, with a policy statement. Draft planning, tendering, monitoring, procedures to be followed by the Authority.
- Program** Specify routes to be tendered, tender program.
- Implement** Finalise detailed tender program. Provide technical assistance to the bus operators in management techniques. Initiate planning, tendering, monitoring procedures.

(measured by veh kms or seat kms, or by network coverage and frequency) for fixed amount of subsidy.

**Developing cities – getting the best operator**

In developing cities, there is unlikely to be a subsidy. If financial criteria are to be used, two options are possible with reference to a specified network:

- the bid offering the highest payment to the authority;
- the bid offering the lowest fare.

The payment of a premium to the authority amounts to a charge on public transport users which may not be consistent with maximising

**Table 7: Problems related to the tender, and strategies to overcome them.**

Problem	Strategy
Existing fragmented, small fleets (a common situation in developing cities)	Must combine to tender
Dominant public-owned, subsidised operator E.g. Damri in Surabaya has 60% of the fleet of large buses	Public operator to be excluded from tender unless costs are transparent
Current licences have long remaining terms	Negotiate surrender or cancellation of existing licences
Withdrawal of buses from existing joint routes to operate tendered routes	Negotiate with operators

public transport use nor of ensuring social mobility.

In many cases the policy objective may be to select the operator most likely to operate a reliable and efficient service. The regulatory authority will not normally have a comprehensive database nor high planning capability, so specifying the services to be provided may best be left to the operator.

The central problem in setting tender criteria is that the factors that indicate the likelihood of

**Table 8: Criteria used for a tender for bus services in Bahrain in 2002.**

Criteria	Maximum Score	Proposal Score
<b>Technical</b>		
Qualifications/Experience of Firm and Key Personnel		
■ corporate experience	5	
■ key personnel to be involved in operation	5	
Subtotal:	10	
Business Plan for First Year of Operation		
■ appropriateness and innovation	3	
■ quality and professionalism	3	
Subtotal:	6	
Initial Service Proposals		
■ appropriateness and innovation	2	
■ quality and professionalism	2	
Subtotal:	4	
<b>Financial</b>		
Fare factor (K)	80	
<b>Total Score:</b>	<b>100</b>	

an operator providing an efficient and reliable service (organisation, corporate experience, experience and qualifications of key staff, financial resources) are not readily quantifiable. The use of qualitative criteria such as these for tenders has been shown to be problematic as comprehension and scores awarded have varied widely between different evaluators.

The criteria used for a tender for bus services in Bahrain in 2002 are listed below. Only bids satisfying the pre-qualification criteria that indicated their capability to operate an efficient service proceeded to evaluation. The evaluated criteria were weighted heavily towards the level of fare (weighting 80%), with three qualitative criteria carrying a total weighting of only 20%. The intention was that fare level would be the decisive factor.

Where the fare is fixed and a financial payment to the authority is not required, the difficulties in evaluating bids are greater as the most easily quantified criterion, the amount of fare, is removed. The main criterion should be that the winning bidder is the most likely to provide a safe, reliable, efficient and demand-responsive service. Factors that indicate this likelihood are the experience, qualifications and financial resources available to operate the service. These are essentially qualitative and it is recommended that they be applied as 'pass/fail' pre-qualification criteria.

Access to more professional or financial resources than necessary to operate the service should not confer an advantage on a bidder.

Similarly, a bid that offers more service (capacity and frequency) than specified in the route specification (provided that the route specification is based on a reliable estimate of demand) should not gain an advantage in evaluation. Excess capacity will increase operating costs and may affect the sustainability of the service, contrary to the interests of users. Further, the authority will find it difficult to penalise the operator if he subsequently withdraws excess capacity.

It is important that the authority sets the route specification at a realistic level in relation to demand and revenue. This emphasises the importance of professional capability in the authority, although such capability is scarce in developing countries. In the absence of professional

resources it is better to keep the tender criteria as simple, basic and quantifiable as possible.

A problem faced by many developing countries is the shortage of professional expertise. Also, expertise tends to be concentrated in the formal transport sector (for example in the state-owned undertaking) although the informal sector often dominates. This is a source of bias where the state-owned undertaking, or its successor, is a bidder in the tenders

## 5.6 Components of the regulatory framework

The regulatory framework will give the authority the necessary powers to implement policies and strategic plans for the development of public transport, and it will implicitly set the limits of that regulatory power. It will also define the rights, obligations and freedoms of the operators.

A regulatory framework comprises various legal instruments:

- legislation (a statute, law, or decree) which may have supranational, national, provincial, metropolitan, or municipal effect);
- regulations made under legislation which formalise technical regulations and operating standards;
- administrative procedures which become subject to legal standards of fairness and objectivity;
- licences and franchises;
- bye-laws.

It is essential that the system of licensing public transport vehicles and services has a sound legal basis. There are several reasons:

- the powers and duties of the regulator are defined, as are the obligations and freedoms of the operator;
- legal drafting will define regulatory principles and procedures with precision;
- the process of legal enactment involves a public process which usually includes full consultation and debate;
- either party (the regulator or the operator) may invoke the law, and has an avenue to request remedial action if the other party is in default or acts improperly;

- defining operating rights in law, limits the risks borne by operators, increases confidence and assists operators to borrow from the formal banking system, thereby encouraging higher levels of investment in the industry.

**5.6.1 Statutes, laws and decrees**

Statutes may apply to a country, a state, or a province. Enactment requires a long procedure of drafting and consultation leading to passage through the legislative body. Statutes should contain only the main principles of regulation; more detailed provisions that are likely to be revised periodically should be contained in regulations which are made with less procedural formality.

In some countries (as in Sri Lanka, Pakistan and Indonesia) responsibility for regulating transport (other than national networks such as railway and air services) is devolved to the provincial governments. Services that cross provincial boundaries may be regulated by a national agency. The list of functions to be devolved to the provinces may be enshrined in the constitution (Indonesia and Sri Lanka). In such cases each province will enact a separate transport statute and regulations. This ensures provincial governments have full jurisdiction over transport within their province, but it creates different regulatory procedures in different provinces, while inter-provincial services (which may carry some intra-provincial passengers) may be different again. This is the current situation in both Indonesia and Sri Lanka.

Another problem is that the necessity to create a separate transport planning and regulatory agency in each province creates a demand for skilled professionals which may not be available.

Typically, the following items will be enshrined in statutes or other legislation:

- the constitution and powers of the regulatory authority;
- procedures for the award of operating rights (by permit, licence or franchise);
- criteria for eligibility to hold a permit, licence or franchise;
- conditions that may be applied to operating rights;
- appeals against decisions of the regulatory authority;

- basic standards of construction, equipment and maintenance of public service vehicles.

**5.6.2 Regulations**

Matters of a more technical nature may be contained in regulations which are made and revised by Ministers without the full legislative procedure of a statute. This facilitates frequent revisions enabling regulations to be kept up to date with changes of technology or operating practices. Regulations take the form of ministerial decrees in some countries (Indonesia).

**5.6.3 Technical guidelines and standards**

Purely technical matters such as vehicle specifications, a fare escalation formula and tender procedures may be contained in a technical guideline or a standard. These are usually drafted by the professional staff of the regulatory department and are not legislation. Standards may be imposed on the operator by the conditions of the licence or franchise agreement.

**5.6.3.1 Bye-laws**

Bye-laws are drafted by the operators to govern the conduct of passengers. They will have legal effect if the operators are empowered by a statute or regulations to make bye-laws. Bye-laws also allow some minor matters to be removed from the legislation.

Bye-laws are only feasible for a substantial operator.

**5.6.4 Regulatory procedures manual**

A Regulatory Procedures Manual may serve four purposes:

**Table 9: Route capacities**

Route Classification	Type of Services	Type of Vehicle	Capacity (pass/day/veh)
Main Routes	Fast Slow	Double decker bus	1,500-1,800
		Large bus	1,000-1,200
		Medium bus	500-600
Branch Routes	Fast Slow	Large bus	1,000-1,200
		Medium bus	500-600
		Small bus	300-400
Small Branch / Twig Routes	Slow	Medium bus	500-600
		Small bus	300-400
		Public passenger car	250-300
Direct Routes	Fast	Large bus	1,000-1,200
		Medium bus	500-600
		Small bus	300-400

- where an authority has little experience of regulation it is prudent to compile, with technical assistance, a comprehensive set of procedures that are consistent with policy objectives, before the new regulatory arrangements start;
- to ensure that the authority discharges the full range of its obligations as well as exercising its powers;
- to create precedents and ensure continuity of regulatory practice over time, as staff change;
- for use as a training aid;
- to provide a reference for operators of how regulatory powers should be exercised.

A manual is less authoritative and easier to change, or depart from, than statutory provisions or a franchise agreement. It will need to be amended periodically in the light of experience and changes in the operational and policy environment.

### 5.6.5 Maintaining laws and regulations

Keeping laws and regulations up to date to reflect changes of policy and practice is quite onerous for the government. There may be shortages of professional staff in the fields of transport planning and regulation and legal drafting. Often, long queues of legislation are awaiting enactment and transport matters may be of low priority. It may take several years for transport legislation to reach the enactment stage, and a change of government may send it to the back of the queue again.

In many developing countries the revision and updating of laws and regulations is not undertaken routinely, and legal provisions become obsolete. The conditions imposed by a route permit or franchise may have no legal basis. This contributes to the risks borne by operators; enforcement officials may use the sporadic enforcement of archaic legislation as a means of harassing or extorting operators. Obsolete provisions also lower general respect for the law. The regulators may rely on the operators being unaware of the content of the law. Indeed, informal individual operators are likely to have little awareness of their rights or of channels of redress and would be unlikely to launch a legal challenge against the authority. They are more likely to take direct, collective action in the form of strikes or street protests.

It is advisable not to insert provisions into the franchise agreement that are already contained in the legislation because inconsistencies and confusion are likely to arise. Where there is any inconsistency between the franchise and the legislation, the latter will prevail.

The concept of ‘controlled competition’ is relatively recent and legislation in developing countries usually does not impose a duty on government to award or renew operating rights by a competitive procedure.

## 5.7 Fare regulation

### 5.7.1 Fare policy

Control of fares is the most politically sensitive issue in the passenger transport sector and, when poorly designed or applied, can be the most damaging to its development. Nevertheless, the exclusive right to operate a particular transport service amounts to the creation of a local monopoly, and so some form of control is necessary to protect passengers.

### The importance of service and reliability

Adapted from BUIP, 1999b

Fares are not the most important consideration, even in low income areas. In a small pilot survey carried out at the same time as a household interview survey for the Bali Public Transport Study project in 1999, 356 respondents – motorcycle, car and public transport users – answered questions aimed at establishing the trip characteristics they consider to be important. Public transport users considered **reliability** (70% rating this as very important), **seat availability** (64%), safety (60%), **personal security** (50%) and **walking and waiting time** at the start of the trip to be the most important factors – well ahead, it seems, of the **cost** (20%) and **total time** (also 20%) of the trip.

### Government focus on low fares may be missing the point

While government efforts focus on keeping fares low, availability and quality of service seem to be viewed as more important by users. These findings are significant in the light of the features of existing services: variable headways (i.e. low reliability); vehicles leaving the terminal full (i.e. low downstream seat availability); and poor network coverage (i.e. longish walking and, combined with variable headways and waiting times).

Public transport policy must address the issue of whether the full cost of providing a bus service should be recovered from passengers' fares or whether any general subsidy, or subsidy of particular groups of users, should be provided. Fare regulation is an integral component of service regulation, but fares are often set for political or social objectives rather than to ensure the commercial viability of the operator(s). In such a case fares may be set uniformly across the network irrespective of the viability of individual services. This implies a degree of cross-subsidy within the network, where the passengers on high-demand corridors effectively support those in peripheral areas. This can be seen as being socially equitable, and supportive of the objective of discouraging private car use.

Where fares are set below the full cost of operations (including asset replacement and a reasonable return on capital), then the system either becomes starved of investment or dependent on external subsidy. In the former case, an unregulated system will usually develop to fill the void, and charge market-related fares that negate the purpose of the original controls. In the latter case, the operators lose their efficiency incentive (as any financial

losses resulting are covered by subsidy), and the amount of deficit increases until it becomes unsustainable.

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.

One of the advantages of a controlled competition regime is that the impacts on subsidy levels of fares control and service specification are immediately apparent in the tender process, rather than being subsumed within the general financial support given to the operator. This assists in the allocation of resources by network planners.

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.



**Fig. 12**  
*Regulatory risk and fare-setting*  
Is an increase in fares to cover increased operating costs a right or a privilege? The lack of a formal mechanism for monitoring operating costs and reviewing fares is evident from this mid-2001 controversy in Jakarta, Indonesia (picture, above). Operators resorted to strikes and raising fares without approval to pressure government to resolve the issue. Government responded by reducing, and delaying the increase, but had no objective basis on which to base its decision. Uncertainty about government's ability to raise fares is a fundamental aspect of 'regulatory risk' and an important element in the minimum-cost, minimum-organisation, minimum-quality 'vicious cycle' (Figure 9).

### Fare-setting in Pakistan

Legislation in Pakistan (s. 45 of the Motor Vehicles Ordinance 1965) provides that the provincial Secretary Transport may fix the maximum or minimum fares for buses by notification in the Gazette. He is required to hear objections, consult the Provincial Transport Authority and the Regional Transport Authority and record his reasons in writing. The following procedures are specified to determine fares:

- Operators apply to Secretary Transport to increase the maximum fare scale;
- the Secretary conducts a financial analysis taking into account estimated costs and revenue;
- the application is published and objections invited and heard;
- the Secretary makes a decision, recording his reasons.

No criteria are specified for increasing fares and operators have no entitlement to fare levels that enable them to recover costs.

Where fares are set too low, operators will find a way of subverting these in order to survive. Thus, for example, when a fare ceiling is set, operators may cut short their routes to the extent that that fare is then sufficient to cover their costs. This has the adverse consequence of forcing passengers to make extra interchanges, and that effect may be exacerbated by fare structures that are flat or have a degree of taper.

### 5.7.2 Fare-setting mechanisms

The use of a politicised procedure to set fares often results in fares being constrained below the level of full cost recovery. Such a process exposes the operators to major risks, and the result is usually a deterioration and reduction of services, which is not compatible with the interests of the poor.

There are several schemes whereby objective criteria are used to trigger fare increases, though none is without disadvantages, and all require some collection of data and some analytical capability within the authority:

1. actual costs incurred projected forward plus a 'reasonable management fee';
2. a formula based on movements in the indices of input costs for bus operation;
3. a fixed rate of return on assets invested;
4. a fixed rate of return on turnover.

Since most developing cities have a mass of small operators or a mix of medium and small operators, and each is likely to have a different cost and revenue structure, application of a uniform fare adjustment mechanism may result in either a different fare scale, or a different rate of return for each operator. The former is preferred because, of the bases for indexing fares listed above, only (4) gives an operator any incentive to improve cost-efficiency. Small disparities in fares between operators are acceptable and will promote competition where a choice of operators is available. Provisions are needed in the regulatory framework to ensure that fare competition does not result in operators lowering costs by compromising basic service standards or safety.

Where an authority lacks analytical capability, it is a policy option to remove controls on fares. However, it is necessary to maintain a

competitive environment to prevent operators forming cartels to fix fares where the market can bear it. The dilemma is, that the authority requires effective capability to create a competitive environment, and if it has that capability it should be able to control fares.

In many cities there are legal provisions specifying administrative procedures for the deliberation of fare increase applications, but often no criteria are specified for evaluating fare applications and determining fares. Legislation rarely provides that an operator has a right to charge fares that enable full cost recovery. In these circumstances it is inevitable that fare controls are exercised with reference to political considerations. Bus fares are a very sensitive issue in developing cities with a high proportion of low-income users. Politicians tend to put government in the role of 'protecting' the public against fare increases, but government often has no market data or cost benchmarks and negotiates from an uninformed position. This results in three-sided conflict between public, government and the operators which can easily become a focus of popular discontent. In such situations it may be prudent for government to relinquish its obligation to set fares, and adopt objective criteria. Severe restraints on fares often result in declining levels of service and safety which impact negatively on the urban poor, including limiting their access to employment opportunities. Market research consistently shows that reliability is the most important quality in a bus service, and it is more important than the level of fares for most users.

The risk that government will not have the political authority to raise fares to cover increases in operating costs must be borne by the operators. This results in reluctance to invest and a rapid deterioration of the service.

In Pakistan paratransit minibus fares were held to very low levels for many years. The operators responded to low fares by adopting a 'minimum cost, minimum quality, minimum capacity' response. Vehicles were 1 tonne delivery vans imported, used, from Japan. They were derelict and severely overloaded. The network was sparse.

A similar fare restraint policy has been maintained in Indonesia, with a similar response from the operators, except that, because the

enforcement mechanism was weak, operators charged fares higher than those authorized, and users accepted the fares charged. Therefore the regulators did not intervene. Fares were still low because they were constrained by market conditions – low affordability and low-cost competition from motorcycles. As long as there was no public protest, regulators took no action to enforce the legal fares. The public debate on the issue is illustrated in Figure 12.

It is recommended that the operators' entitlement to recover costs from fares should be clearly defined in the regulatory framework:

- operators should be legally entitled to charge fares that enable full cost recovery – either by legislation or as a condition of their licence or franchise;
- fare increase applications should be resolved by objective criteria, and removed from the political arena; or
- where sufficient competition exists, fares should be deregulated.

## 6. Conclusions

Important factors in the amenability of bus operators to regulation are the *structure of the industry* and a *government commitment* to clear policy objectives, in particular those that resolve the dilemmas between the level of fares, the quality of service and the level of cost recovery.

*Cost recovery* from fares is an important threshold. Bus systems that achieve cost recovery are simpler to regulate, since they may use the incentive of competition between operators (competition 'in the market'). Experience has shown that competition provides the most effective incentive to efficiency and responsiveness to demand. The key roles of an authority are then to maintain basic standards plans and strategies, and to ensure that competition remains effective.

Below the threshold of full cost recovery from fares, more *sophisticated regulation and planning strategies* are required to create incentives on operators to be efficient and responsive to demand. Arrangements also have to be made for funding operating deficits, ensuring value for money and accountability in the use of public funds.

*Competition* 'in the market' is difficult to achieve where revenue is insufficient to cover costs; the market will not supply such services so government must subsidise operations.

*Subsidies* may be applied by post-facto funding the deficits of a loss-making state-owned operator. Such an operator may operate alongside small-scale or paratransit operators who recover full costs, often from the same fares. This situation is common in developing cities, but usually a balance between a loss-making state undertaking and entrepreneurial private operators cannot be sustained. The private operators tend to abstract the most lucrative passenger traffic from the state operator, who suffers increasing losses, reduction in investment, and low motivation of management. Applying subsidies to the deficits of a state-owned operator without sophisticated performance and accountability monitoring is therefore not sustainable. Performance indicators - measuring efficiency, productivity, service quality - can provide benchmarks of an opera-

### Paratransit fares in Pakistan

It was widely stated by transport operators in Lahore that whilst minibus operations could cover their costs from revenue at a very low equilibrium of service quality and fares, it was impossible to recover the financing and operating costs of a locally-built standard bus (cost PKR 2,800,000 = US\$ 61,000) at current fares. The government's minimum fares policy satisfied neither the public need for safe adequate, affordable transport nor the operators' need for a reasonable financial return sufficient to cover operating and maintenance costs as well as provision for vehicle replacement.

### Fare-setting in Bangladesh

The same situation prevails in Dhaka, Bangladesh in 2002. Official fares have not been increased since 1997, despite increases in the price of fuel and imported components. Operators have raised fares unilaterally to a level double the official rate, but since there has been no outcry from users, no enforcement action has been taken. Now government faces a difficult dilemma: whether to make the actual fares official, and risk a political resistance, or whether to do nothing and erode the credibility of the regulator.

tors' performance, but these are not as effective as competition. Incentives to improve performance must derive from the regulation.

The two extremes of industry structures (a fragmented industry in small-scale or individual ownership, and monopoly) are the most resistant to regulation.

Fragmented ownership is a very common in developing cities. It often derives from a licensing system based on 'one vehicle, one licence' under which each vehicle is a separate business and no operator has responsibility for the efficient operation of the route. Under these conditions operators are likely to organise to prevent new entrants to the market. This can result in the rigidity of the network so it becomes unresponsive to changes in demand and initiatives by the authority.

Applying subsidies to the fragmented small-scale bus sector is not feasible because of accountability and control problems, so bus subsidies are unusual in developing cities. It is more common for the quality and service level of the bus system to fall to a point of equilibrium where fares that are affordable by users are sufficient to enable cost-recovery. At this point, service quality and safety may be extremely low.

The situation in developed cities is different. Most city bus systems in continental Europe have been subsidised since their establishment, others in the USA have required subsidy more recently as motorisation has eroded viability. In many cities it has long been government policy to subsidise public transport to provide an alternative to the private car in order to preserve urban amenity, environment and equality of mobility for all citizens. In such cities, the real costs of high quality public transport have risen progressively, and the key challenge has been to ensure value for money in the provision of services.

The response to that challenge has been the development of strategies operators compete for the right to operate and are then granted a period of exclusive operation. Operating rights are periodically re-tendered to ensure downward pressure on costs is maintained. The strategy of *competition 'for the market'* is being proposed as a standard by the EU. In order to

create competition, there should be a number of operators in the market. This strategy is highly dependent on the effectiveness of the authority as the authority must plan and specify each route prior to inviting bids, and the bidding procedure must be transparent and rigorously correct if operators are to have confidence in the process. The authority may also be the fare collection agency. In many cities a dedicated transport authority, with some operational and budgetary autonomy has been created.

The strategy of competition 'for the market' is often difficult to implement in developing cities due to low institutional capability and the low availability of capital. Nevertheless, substantial benefits may be achieved applying a simplified planning process and tender technique among existing operators.

Planning need not be technically sophisticated or involve extensive surveys, but should involve systematic collection of performance data, evaluation of deficiencies in the existing system, and feedback from users. It must follow a continuous cycle, with the main output being an annual or biannual review and plan.

A simplified strategy of *tendering* may provide an incentive for individual operators on a route to combine into an association or cooperative in order to hold a route franchise and thereby assume collective responsibility for the operation of the service. The consolidation of individual operators is fundamental to effective control through a licence. Tender criteria may also be used that provide incentives to higher quality vehicles or regular fares.

It is recognised that, to change the status quo, whether it be to restructure an inefficient loss-making state-owned bus operator or to consolidate and improve a low-quality paratransit service, a degree of *considerable political will and institutional capability* is needed.

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### Some further references

- Module 3b of the *Sourcebook: Bus Rapid Transit*, looks at bus service planning from the perspective of Bus Rapid Transit
- The World Bank Website transport section includes useful references on bus regulation and planning in the developing world. See for example [http://www.worldbank.org/transport/publicat/pub\\_tran.htm](http://www.worldbank.org/transport/publicat/pub_tran.htm), and <http://www.worldbank.org/transport/urbtrans/pubtrans.htm>
- The Institute of Transport Studies of the University of Sydney, through the THREDBO conference series – International Conference on Competition and Ownership in Land Passenger Transport – has an excellent series of papers on bus regulation and planning from two major conferences (Johannesburg in 1999, Molde in 2001), <http://www.its.usyd.edu.au/conferences/thredbo/thredbo.asp>



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