

Asian Development Bank

REGIONAL TECHNICAL ASSISTANCE ON URBAN INFRASTRUCTURE FINANCE (RETA 5646)

Case Study Paper on Urban Transport

Prepared by
David Bray

April 1996

Table of Contents

	Page
Executive Summary	i
1. Introduction	1
2. Principles and Approaches	
A. From Whence We Come	2
B. Principles for the Provision and Financing of Urban Transport Infrastructure	3
C. The Cost of Urban Transport	5
D. The Context for Innovation	7
3. Key Issues with Implications for Financing Urban Transport	
A. The Urban Transport Context	8
B. Key Issues in Financing Urban Transport Infrastructure	13
C. Conclusions	16
4. Case Studies - Analysis and Issues	
A. Introduction	17
B. Case Studies	17
C. Distilling and Interpreting the Experience	34
5. Directions for Reform	35

List of Tables

	Page
Table 1 Cost of Existing Urban Transport in Adelaide, Australia, 1994	6
Table 2 Fleet Replacement Cost in Jakarta and Solo	6
Table 3 Methods for Funding Road Development	18

Boxes

		Page
Box 1	Privatisation of Plant and Equipment, Victoria, Australia	20
Box 2	Underpass of Jl Jenderal Sudirman, Jakarta, Indonesia	21
Box 3	Toll Roads, Jakarta, Indonesia	22
Box 4	Manila Light Rail Transit Line 1, Philippines	24
Box 5	Municipal Development Fund Financing for Bus/Jeepney Terminal, Tagum, Philippines	27
Box 6	Competitive Tendering of Public Transport Services, Adelaide, Australia	28
Box 7	Taxi De-regulation in Bangkok, Thailand	29
Box 8	Road Vehicle Taxation Reform, Indonesia	31
Box 9	Private Vehicle Inspection, Thailand	22

EXECUTIVE SUMMARY

Context

- i. Urban transport plays a central role in the economy of cities, and in the lives of the people who live in them and who travel to and from them. The role of urban transport is magnified by the disproportionate amount of countries' economic activity and decision-making that occurs in the cities. And, as most people in cities make daily use of transport, it is an issue of interest and consequence for them.
- ii. There have been various approaches to the development and financing of urban transport infrastructure over the last few decades. None has been able to provide a sustainable and effective solution. Continuing rapid economic growth has placed new demands for the development of transport infrastructure. The 1990s has been characterised by an emphasis on private sector participation in the provision of fixed transport infrastructure. The success of this approach has, to date, been limited. Nevertheless, these various approaches have provided the context in which different approaches to the financing of urban transport infrastructure have been utilised. This provides the opportunity to examine some of the strengths and weaknesses of this past experience and hence lessons for the future.
- iii. The urban transport system requires both fixed transport infrastructure such as roads and mobile infrastructure (ie vehicles). Governments have traditionally been responsible for fixed transport infrastructure. Even so, it appears likely that the private sector is a much larger investor in urban transport infrastructure through its investment in vehicles.
- iv. Finally, broader issues such as the structure, management and pricing of urban transport have a major impact on the type and quantity of infrastructure that is required, and hence the need for and nature of financing that is required to support development of the infrastructure. It is therefore necessary to consider the financing of urban transport infrastructure in conjunction with broader urban transport policy issues.

Issues with Implications for Financing Urban Transport

- vi. A number of features of urban transport have implications for financing urban transport infrastructure. Key issues include:
 - Infrastructure Needs. The need for transport infrastructure is influenced by the level and structure of prices imposed for use of the infrastructure, the quality of service that is desired, the efficiency with which the infrastructure is used, and the effectiveness of urban planning.
 - Mobilising Funds. The level of funding for infrastructure is affected by prices which, in turn, provide the revenue to finance transport operations and capital investment. Private sector involvement in urban transport has the potential to lower costs and to provide access to the financial resources of the private sector. Private sector involvement can be achieved by a range of means, including contracting out, cost sharing, BOOT-type schemes and privatisation. It is likely that government will remain responsible for financing fixed transport infrastructure. Given a suitable macro and micro-economic environment, there appear to be few major constraints to the mobilisation of funds by the private sector for investment in road vehicles.
 - Role of Government. Governments will remain responsible for regulating infrastructure services. There is also a need for governments to be responsible for transport planning and, probably, to contribute to the cost of developing fixed

transport infrastructure even where it is developed primarily by the private sector. In general, there is a need for government to focus on its unavoidable role of facilitating the development and operation of urban transport.

Case Studies

vii. Case studies of investment in urban transport infrastructure presented in this paper include: privatisation of road construction plant and equipment in Australia; private sector funding of road infrastructure associated with property development and private sector financing of toll roads in Jakarta (Indonesia); financing of a light rail line in Manila (Philippines); financing development of a bus/jeepney terminal in a small town in the Philippines; taxi deregulation in Bangkok (Thailand); competitive tendering of public transport in Adelaide (Australia); road vehicle taxation reform in Indonesia; and vehicle inspection by the private sector in Thailand.

viii. The case studies reinforce the previous observations. In addition, it is evident that there is little documentation of innovative practices for financing urban transport infrastructure in Asia. This limits the potential for the propagation of successful practices. The case studies also indicate that investment in sustaining and developing urban public transport can be enhanced by minimising entry controls to the industry, by allowing a range of transport services to be provided and by ensuring that tariffs are sufficient to allow full cost recovery. Finally, the case studies describe practices with which people will generally be familiar; ie there are relatively few truly innovative practices, just good practices that could be applied more widely.

Directions for Reform

ix. The extent to which potential practices are not used suggests that decision-makers are either unaware or unconvinced of the merits of the measures. This suggests, in turn, that there is need to better develop and articulate an urban transport finance strategy that can provide a more effective and sustainable basis for future development of the sector. Such a strategy needs to be founded on taking advantage of the best respective roles for government and the private sector to develop the partnership that is required for effective urban transport. It will include six major elements:

- Devolving Responsibility for Urban Transport Infrastructure. Responsibility for urban transport should be devolved to the lowest level at which it can be practically undertaken. This will ensure that it can be responsive to the needs of consumers, can avoid the higher cost and remoteness that can result from decisions that are made elsewhere, and should allow innovation to be implemented more rapidly and flexibly. There is a corresponding need to for local authorities to promote efficient urban transport rather than sectional interests.
- Formulating Transport Infrastructure Development Strategies. Government has a vital role to play in planning and guiding the development of cities. For urban transport infrastructure, this requires planning that takes into account the network effects of transport, interactions with land use development policies, social and environmental considerations and coordination with development in other sectors, in addition to the recognition of explicit economic costs and benefits. It also requires consistent and rigorous evaluation procedures to ensure that the most worthwhile projects are identified.
- Developing an Appropriate Regulatory, Pricing, Financing and Administrative Framework. Government has a major impact on the mobilisation and effectiveness of investment in urban transport through its management of the sector. Issues that need to be addressed include: (i) the need for consistency and certainty to provide

investors with confidence regarding future conditions; (ii) the need for regulation of transport markets only where deficiencies that arise from market imperfections exceed those that result from government intervention; (iii) improvements in the level and structure of prices for the use of urban transport, using efficient transport markets to determine prices where possible, keeping entry to the transport market as open as possible, ensuring that controlled prices are responsive to changes in industry costs, ensuring full cost recovery for transport services, and careful justification of subsidies; (iv) developing better linkages between revenue from transport and disbursements by those who are responsible for providing and operating transport infrastructure; and (v) in keeping with its core function as a facilitator of urban transport, governments should seek opportunities to contract out activities that can be undertaken by the private sector and managed on a contractual basis.

- Securing the Best Means for Provision and the Best Providers of Infrastructure. There is a need for governments to better understand the relative merits of the various approaches to financing fixed transport infrastructure and the strengths and weaknesses of using private and public sector funds. In general though, recent trends suggest that there is the opportunity to make better use of the private sector in the provision of urban transport infrastructure and services. As governments will continue to be responsible for transport infrastructure services, efficient provision of transport infrastructure by the private sector will be dependent on the use of a consistent approach and competitive and transparent tendering processes.
- Developing Capital Markets. Fostering private sector investment requires the development of knowledge and confidence in financial markets to facilitate the provision of finance on a commercial basis with minimum risk premium. Allowing the operation of a range of public transport services allows investment from modest amounts for non-motorised vehicles to larger sums for buses, and hence the opportunity to mobilise savings from a range of sources (from individuals to formal capital markets). It is likely that there are opportunities to improve the competitiveness and hence efficiency of these sources of capital.
- Undertaking Research, Development and Promotion. There is a need for research and development to provide decision-makers with sufficient evidence to support, and to promote, proposals for the changes that will enable more capital to be mobilised more efficiently for investment in transport infrastructure.

I. INTRODUCTION

1. This paper is one of a series commissioned by the Asian Development Bank (the Bank) as part of a Regional Technical Assistance (RETA) program on Urban Infrastructure Finance. Other papers in the series include national studies for ten Developing Member Countries (DMCs) of the Bank, three theme papers and three other case study papers. The papers are intended to complement one another. Similarly, the current program complements a similar program undertaken by the Bank on Megacities Management in Asia and the Pacific.

2. The papers were prepared following an Initiating Workshop at the Bank in Manila in January 1996, and were presented and discussed at a Concluding Seminar in April 1996.

3. The RETA focuses on urban infrastructure finance issues, including: (i) the identification and evaluation of best practices; (ii) an assessment of the effectiveness and replicability of recent innovations in financing; (iii) the development of practical, workable and sustainable approaches; and (iv) the formulation of recommendations for improving financial management and administration for urban infrastructure.

4. The current paper considers roads, public transport, other modes of urban transportation and traffic management. The focus of the current paper is on small to medium size cities. Nevertheless, case studies from megacities have been used as, on occasions, the pressures evident in these cities have demanded innovative measures that may be applicable, perhaps with modification, to smaller cities. At the same time, smaller cities sometimes have greater scope for flexibility and innovation. Some of these instances are addressed in the current paper. Finally, some of the experience in more developed countries are also pertinent to cities in DMCs, and a few of these examples are also considered.

5. The concern of the current paper is the financing of urban transport infrastructure. However, broader issues such as the structure, management and pricing of urban transport have a major impact on financing, and hence need to be considered.

6. The next chapter of this paper considers the nature of the transport sector and the major alternative approaches towards the financing and provision of each service. The following chapter discusses current key issues in financing urban infrastructure and the issues which are likely to emerge in the future. Chapter IV describes the thrust and nature of current practices in financing urban transport infrastructure and illustrates these practices with case studies from the Asia region and from elsewhere. The final chapter considers directions and options for reform to further improve resource mobilisation and economic efficiency.

Acknowledgments: The author acknowledges the assistance of Mr Philip Sayeg for the identification and description of case studies for this paper.

II. PRINCIPLES AND APPROACHES

A. From Whence We Come

7. Urban transport plays a central role in the economy of cities, and in the lives of the people who live in them and who travel to and from them. The role of urban transport is magnified by the disproportionate amount of countries' economic activity and decision-making that occurs in cities. And, as most people in cities make daily use of transport, it is an issue of interest and consequence for them.

8. Because of its importance, urban transport has been subject to considerable attention by governments and others. The current approach to urban transport can be traced back through three previous major phases in the last four decades (see also Allport 1995 and ADB 1989):

- The inadequacies of the deterministic, end-state infrastructure planning of the 1960s. In general, the infrastructure proposals neither gained public support nor were they implemented on the scale proposed.
- The quadrupling of oil prices in 1973 illustrated the vulnerability of transport, and of the economy at large, to external shocks. It also led to renewed questioning about the desirability of the trend in travel demand from public to private transport. The slowing of economic growth rates reduced pressures on urban infrastructure and allowed modest incremental improvements to accommodate rising demand. Despite a second major hike in oil prices in 1979, the policies of the 1970s were not, ultimately, able to provide the basis for the sustainable development of transport infrastructure.
- Declining fuel prices and rising economic growth in the 1980s resulted in increased demand for urban travel, particularly by private vehicle. The demand for public investment in all areas of the economy was generally high, and transport had to compete for capital. As a result, a more balanced approach to infrastructure development was adopted to minimise the need for additional infrastructure. The approach sought to combine action plans and strategies to improve the effectiveness with which existing infrastructure was used. However, the most crucial transport needs were (and continue to be) in localities where the opportunity to improve infrastructure and operations were constrained by limitations of space, the high cost of improvement options, and competing political, social and economic interests. This approach too was unable to provide an effective solution.

9. The 1990s has been characterised by its emphasis on private sector participation in the provision of fixed transport infrastructure. There have been high ambitions for this approach. Yet, to date, it must be concluded that its success has been limited. To be successful, the approach requires an appropriate legal framework, successful financial markets and appropriate projects. Later sections of this paper will conclude that while there is a role for private sector participation in the provision of transport infrastructure, it is, alone, an insufficient basis for the future development of urban transport. Instead, there will be a need to clearly identify and develop the role of government, and to exploit more effectively the partnership of private and public investment in transport. This approach will not obviate the continuing need for governments to address issues such as transport planning, policy and pricing.

B. Principles for the Provision and Financing Transport Infrastructure

10. While the function of urban transport is common to most cities, there are differences in the way in which the activity is administered, in the quantity and type of infrastructure provided and in the way that the infrastructure is financed. Given these differences, it is useful to examine the nature of urban transport and the principles which can guide the efficient and effective provision of infrastructure and services.

11. Urban transport involves a number of activities and participants:

- In the case of road transport, roads must be constructed and maintained, the road system operated using traffic signals and control of parking and traffic. These tasks are undertaken by a small number of agencies.
- Fixed track public transport such as railways and guided busways are usually provided by vertically integrated agencies which construct and maintain the tracks and associated vehicle control systems, which purchase vehicles, and which operate the system as a whole.
- The ownership and use of private, corporate and public transport vehicles used on the road system is widely dispersed.

12. A large number of people are involved in the supply of urban transport infrastructure and services. In essence, though, the services are provided either: (i) under the authority of government (either by a government organisation or by the private sector under contract to the government); or (ii) by the private sector, either in an unregulated market or in market that is managed by government through licensing, price control and the provision of subsidies.

13. It is usually argued that private provision is the superior means for the efficient allocation of resources in an economy. However, public involvement may be warranted in the event of market failure, that is when economic markets do not provide the most efficient and appropriate services. Economists identify five situations which may result in market failure (see also Roth 1987):

- The presence of monopolies. Urban transport is not generally a natural monopoly as there are usually many potential providers of transport services and alternative means for travelling.
- The presence of economies of scale. If the average cost of providing a service decreases as output increases, an existing provider can, for a while at least, provide services at lower cost than a new entrant and hence discourage competition. Moreover, if prices are equal to marginal cost, as is economically desirable, the service provider will be unable to recover their costs. Technological and organisational developments in transport have reduced the significance of economies of scale. Declining costs are, however, a feature of fixed-track public transport systems. This increases the difficulty for private sector provision of such systems. It also provides a competitive edge to road-based public transport that does not have such economies of scale.
- The presence of externalities. The production and consumption of a good or service may impose costs that are not reflected in its price. If property rights cannot be used as a means for ensuring that these costs are taken into account, there is a role for government to intervene to achieve the same effect. Externalities are clearly present in transport, with negative externalities such as noise and air pollution and positive externalities such as the benefits arising from improved accessibility. The presence of externalities is better addressed by regulation, taxation or subsidies by government rather than by government provision of the services.

- The provision of public goods. Some goods and services of value to the community such as street lighting and defence have the characteristic that use of them by one person does not diminish their value to others. Moreover, it is neither possible to charge individual users for their use of such public goods, nor to exclude those who are not prepared to pay from gaining the same benefit. Because the private sector cannot collect revenue from the use of such items, it is necessary for governments to ensure their provision. In transport, footpaths and roads have the features of a pure public good at low to moderate levels of demand. At higher levels of demand, congestion results in the use of them by some people reducing their value to others. The capacity to build toll roads and the potential for technology to allow motorists to be charged for their specific use of roads will reduce the need for government provision of roads on the criterion of public good. Public transport is not a public good, even at low levels of demand.
- The provision of merit goods. These are goods that the community might consider to be of special value and would prefer to see more of them consumed than would occur in ordinary markets. The situation goes beyond that which occurs with a positive externality. It covers goods and services for which current or potential consumers are considered to benefit more than they realise from use of the good or service, and hence under-consume the item. Transport does not appear to have the character of a merit good.

14. It is of note that economists do not usually include social equity as a basis for public provision of goods and services. Rather, they argue that where there is a case for public support for particular groups of disadvantaged people, the support should be provided directly to those people. Thus, the provision of subsidised public transport as a means for assisting the poor is a second-best solution, at best, to more direct means for providing support.

15. While “market failure” indicates a need to take some action to remedy the resulting inadequacies, there has been increasing recognition of the presence of “government failure” or “regulatory failure”. Such failure occurs when government intervention itself results in deficiencies such as price distortion, inefficiency and the potential for interest groups to seek outcomes for their own benefit. As a result, recent trends have placed renewed emphasis on making the best use of private markets and on seeking practical institutional arrangements and responses to instances of market failure.

16. In this context, the grounds for government involvement in and provision of urban transport infrastructure and services are perhaps more limited than occurs in practice. It appears that there are roles for government:

- in ensuring the provision of footpaths everywhere and roads in uncongested areas (which will mostly be the case in small to medium size cities), on the basis that they have the character of public goods;
- in providing or facilitating the provision of mass transit systems, where they can be justified, because of the economies of scale associated with such systems;
- in response to the presence of externalities through use of regulation, taxes and subsidies; and
- to take a longer term and broader view with respect to transport planning and the acquisition and protection of land for transport corridors on the grounds of market failure (in particular myopia and lack of collective power in the private sector).

These roles require decisions regarding the quantity of transport infrastructure to be provided. There are also options regarding the means by which the infrastructure will be financed, developed and operated.

C. The Cost of Urban Transport

17. Governments are generally aware that the cost of their involvement in urban transport is substantial. They may not, however, have a good appreciation of its total cost because activities are distributed between agencies and are funded through various channels. There is also generally little understanding of the significance of this expenditure in terms of total urban transport costs. Such data is rarely developed. Data for Adelaide, Australia (a city of 1.1 million people) is presented in Table 1. While the actual scale and distribution of costs will vary by city, two features evident in Table 1 are likely to be common:

- After removal of sunk costs for fixed infrastructure (eg land and earthworks), private sector investment in vehicles and ongoing expenditure on vehicle operations is many times greater than expenditure on fixed public infrastructure for transport. For Indonesia as a whole, it has been estimated that vehicle operating costs account for 85 percent of total transport costs including external costs such as pollution (World Bank 1995).
- Commercial vehicles (which include vehicles such as vans in addition to trucks), while accounting for a relatively small share of traffic, account for a much higher share of costs.

18. The costs presented in Table 1 reflect a static situation, ie sustenance of a given transport system. In practice, there is a need to build new infrastructure and to add capacity to existing infrastructure, particularly for roads. The unit marginal cost of such work is much higher than the average replacement cost. Similarly, the total cost of roads, ie including sunk costs (but still excluding land and major service relocation costs), may be three or more times the cost of the replacement components. Even so, a several fold increase in the expenditure on roads in Table 1 to reflect these factors does not change the broad implications of the data.

19. Thus, it appears that the private sector is already the dominant investor in transport infrastructure through its investment in road vehicles. This is an example of private-public partnership in transport investment wherein government investment in roads has been accompanied by a substantial and complementary investment in vehicles. The effectiveness of the investment in vehicles by the private sector is, however, a function of the quantity and quality of the investment in roads and operation of the road system. Inadequacies in these activities have the potential to increase other transport costs and to thus constrain economic and social activities.

20. The scale of investment in vehicles in Asian cities should not be under-estimated. Table 2 shows the estimated replacement value of all motorised vehicles in Jakarta and Solo (with populations of 9 million and 0.5 million respectively). Even though car ownership is much lower than in Adelaide, the value of the fleet in each of the Indonesian cities is considerable. Most of this investment will have been made by the private sector. In addition to the motorised vehicles shown in Table 2, there are large numbers of non-motorised vehicles. There are some owners of larger fleets of these vehicles. It is relatively more likely, though, that they are owned by individuals, families and small-scale enterprises, and therefore represent a substantial mobilisation of small scale savings.

Table 1
Cost of Existing Urban Transport in Adelaide, Australia 1994
(A\$ billion, 1994 prices)⁽¹⁾

Component ⁽²⁾	Replacement Capital Cost ⁽³⁾	Average Annual Capital & Operating Cost			
		Deprec. & Interest ⁽⁴⁾	Operations & Maint.	Total	Share
Roads:					
Arterial	1.1	0.09	0.06	0.15	
Local	1.1	0.08	0.05	0.13	
Sub-Total	2.2	0.17	0.11	0.28	6%
Public Transport:					
Fixed Track	0.6	0.04	0.03	0.07	
Vehicles	0.5	0.04	0.14	0.18	
Sub-Total	1.1	0.08	0.17	0.25	5%
Other Vehicles:					
Cars	13.8	2.03	1.01	2.04	
Commercial Vehicles	5.7	0.78	1.43	2.21	
Sub-Total	19.5	1.81	2.44	4.25	89%
Total	22.8	2.06	2.72	4.78	100%

(1) A\$1.00 = US\$0.75

(2) 94 percent of person trips are made by car and the remainder by public transport. Commercial vehicles account for 19 percent of vehicle trips and cars for most of the remainder of vehicle trips.

(3) Cost of reconstructing or replacing items that deteriorate over time, ie excludes sunk costs.

(4) For capital items based on the replacement cost and economic life of assets and using an opportunity cost of capital of 7 percent.

Source: Bray (1995).

Table 2
Fleet Replacement Cost in Jakarta and Solo, Indonesia
(1996 prices)

Vehicle Type	Jakarta (1994)			Solo (1987)		
	No. of Vehicles ('000)	Value of Fleet		No. of Vehicles ('000)	Value of Fleet	
		Value (US\$b)	Share (%)		Value (US\$m)	Share (%)
Car	754	10.6	68	3.1	44	47
Bus	30	1.0	6	0.3	11	12
Truck	75	2.6	17	0.4	14	15
Motorcycle	1,345	1.3	9	16.7	25	26
Total	2,685	15.5	100	20.5	94	100

(1) Vehicles registered in Jakarta may also be used outside the city, especially buses and trucks. Only those vehicles which it is estimated are used within the city are shown in the table.

(2) Cars include taxis and light commercial vehicles, and are taken to have a replacement cost (ie the capital cost of a new vehicle) of US\$14,000 per vehicle. The average replacement cost for trucks and buses is about US\$35,000 per vehicle. A cost of US\$1,500 is used for motorcycles.

Source: Consultant estimates.

D. The Context for Innovation

21. Despite the limitations of the past approaches to urban transport described in para. 8, they have allowed different approaches to the provision and management of urban transport infrastructure to emerge and to be tested. Despite their limitations, there has been a measure of success. In the face of sustained economic growth, transport capacity has been increased through the provision of additional infrastructure and better management practices. Even so, growth in the demand for mobility, personal mobility in particular, has been relatively higher and has resulted in rising traffic congestion. In the absence of some calamity, these trends can be expected to continue and thus demand an ongoing search for potential solutions.

22. Issues related to transport in megacities have been considered in a previous RETA arranged by the Bank (ADB 1995). The pressures in these large cities have demanded new, more effective means for developing and managing urban infrastructure. The pressures in small and medium size cities are considerably less, and have reduced the demand for innovative practices. Nevertheless, the experience in the megacities is pertinent both in indicating the trends which may need to be addressed in smaller cities in the future and in providing examples of innovative practices. Conversely, small cities sometimes offer greater flexibility and opportunity to test new practices.

23. Investment in transport infrastructure has been complemented by more broadly-based urban development programs, particularly for small to medium size cities. These programs have placed considerable emphasis on increasing the mobilisation of financial resources by local government for infrastructure investment. They have also offered the means to promote the better integration of transport development with that of other sectors.

24. Recent experience with privatisation and private sector participation in infrastructure provision has also provided the opportunity to review the experience to date and to identify future opportunities and constraints (see, for example, EPAC 1995 for the results of an inquiry into private sector involvement in public infrastructure in Australia).

25. Such circumstances have provided the impetus to identify and test innovative solutions. The current paper describes some of these solutions. Firstly, though, the next section discusses in more detail some of the issues that have implications for the provision and financing of urban transport infrastructure. These issues include the role of government, the nature of transport demand, pricing and cost-recovery for urban transport, and the provision and operation of roads and public transport. Consideration is also given to underlying trends that are likely to influence these issues or which may introduce new opportunities and constraints in the future. Key issues for financing transport infrastructure are then identified.

III. KEY ISSUES WITH IMPLICATIONS FOR FINANCING URBAN TRANSPORT

26. The financing of urban transport infrastructure cannot be considered in isolation as it is closely related with other factors such as the role of government, the need for the infrastructure and charges for its use. While the discussion in the previous chapter suggests that the need for government intervention in urban transport may be less than is commonly considered necessary, the nature of urban transport is such that there are still key roles for government. This chapter reviews the issues that have implications for the provision and financing of urban transport infrastructure, and then considers specific concerns.

A. The Urban Transport Context

1. The Role of Government

27. Governments have a critical role in planning the development of transport infrastructure and securing its provision. A number of factors contribute to this need:

- governments need to respond to market failures that inhibit private sector involvement;
- governments influence transport prices through taxation and regulation;
- governments have the power to acquire land required for transport infrastructure;
- a long term perspective is required because of the long lead times for the development of transport infrastructure and its generally long life;
- development of transport infrastructure also influences land use in ways that makes subsequent unplanned expansion of the infrastructure difficult and expensive; and
- in a broader sense, the planning and provision of transport infrastructure should be integrated with land use and other development policies.

28. The traditional view has been that private markets cannot provide the appropriate amount of transport infrastructure. As indicated previously, there are structural reasons why this may be the case with respect to roads and fixed track public transport systems. However, changing attitudes in both government and the private sector have provided the opportunity for both sectors to find new ways to work together to provide and operate this infrastructure. There should be little need for provision of other public transport services by government. The role for government in transport planning and management of the transport sector remains vital. Indeed, the need of private sector investors for certainty and consistency places an even greater priority on clear public strategies and plans for transport.

2. Transport Demand

29. Growth in transport demand is the principal factor that drives the need for infrastructure investment. It is sometimes expected that governments should provide infrastructure to meet all revealed demand. This can be an onerous obligation if it is to be achieved unconditionally. On the other hand, considerable emphasis is sometimes placed on the management of demand as an alternative to providing additional infrastructure. As the economic cost of providing too much or too little infrastructure can be substantial, it is important to determine the level of transport demand, and hence infrastructure, that is appropriate.

30. Travel is rarely undertaken for its own sake. Rather, it is undertaken by people to allow them to participate in economic and social activities and for the movement of freight. As with most other activities, though, the quantity of travel that people choose to make will depend on the price that they are required to pay. If the cost is too low by comparison with its cost, more travel will occur than is efficient and there will be an artificially high level of demand for infrastructure. If people pay the full cost of their travel, further constraints (such as inadequate provision of infrastructure or regulatory interventions that artificially increase the cost of travel or constrain travel demand) will unnecessarily limit the activities in which people can participate; this will reduce social welfare and economic activity.

31. The travel decisions of people are influenced by the cost of travel. In the case of travel by road vehicles, some costs such as registration fees and a part of vehicle depreciation do not vary with the amount of travel that is made, and hence have no influence on individual travel decisions. The remaining costs of motor vehicles, described as variable costs, change with the amount of travel that is made. However, many of the variable costs are incurred only periodically (eg depreciation, maintenance and even fuel), and hence may be overlooked when people make individual travel decisions. Other costs such as externalities arising from pollution may be ignored altogether. As motorists do not perceive all of the variable costs of travelling when they make travel decisions, they are inclined to use their vehicles more than is economically optimal.

32. The perceived cost of travel by public transport includes the cost of a ticket and the value of personal travel time. The cost of the ticket will include all of the costs of providing the service, less any subsidy that is provided to public transport operators. If fares for public transport are reduced by the provision of subsidies, people will travel more than is economically optimal. Conversely, the cost of travel by public transport will include fixed costs which should not influence travel decisions. However, these costs will be small in the case of road-based public transport and hence should not cause a major distortion. Fixed costs will generally be substantial for fixed track public transport systems, but will be offset by the relatively greater subsidies that are usually provided to these systems.

33. For travel by both public and private transport, it is likely that few people take into account the negative external costs of their travel such as increased pollution and congestion. This increases the inclination to travel more than is optimal. It is more likely that the effect of positive externalities are taken into account by people, and are reflected in their travel decisions.

34. As road users probably under-estimate the cost of their travel when making travel decisions, constructing additional infrastructure to accommodate all revealed travel demand is inappropriate. Conversely, providing an optimal amount of infrastructure (if indeed this can be determined on an analytical basis) given current transport prices results in congestion. Thus, setting the correct prices for use of the transport system is vital to ensuring that the level of demand is appropriate and for providing clear signals regarding the need for additional infrastructure. Appropriate prices are critical to securing and sustaining private sector investment in transport infrastructure.

3. Pricing and Cost Recovery

35. The quantity of travel is not inflexible, and people undertake more travel if its price is reduced and vice versa. An increase in the quantity of travel is not necessarily bad. If people meet the full cost of their additional travel, it indicates that they have gained a benefit from the travel in excess of its cost. More freight transport may indicate a change in production and logistic processes whereby the cost of the additional travel will have been more than offset by savings elsewhere. These responses indicate that people do not necessarily minimise the amount of travel that they undertake, but rather optimise the travel on the basis of its cost and value.

36. Charges for the use of infrastructure are therefore critical for two reasons: (i) to ensure optimal use of infrastructure; and (ii) to generate revenue to meet the cost of providing and operating the infrastructure. To the extent that the first of these is not achieved, there will be either suppressed or excess demand for the infrastructure, and economic and social welfare will be less than could be the case. If cost-recovery cannot be achieved, there will eventually be pressure to reduce expenditure, and the quality and quantity of transport services and, eventually, of the infrastructure itself will decline.

37. Governments have rarely placed the pricing and financing of urban roads on a transparent basis. Roads are treated as a public service rather than an economic activity, and are financed from general government budgets. Charges and taxes imposed on transport are set more on the basis of pragmatism and on broader taxation principles than on the grounds of economic efficiency and cost-recovery.

38. Governments have usually controlled public transport fares (and have, more generally, regulated public transport) on the grounds of equity and certainty for users. Increasing fares can be difficult as the rise will often be judged on the basis of its political and social significance rather than on the cost of providing the services. If fares are not increased to cover higher costs, there will be a need for increased subsidies for publicly-provided services. Where subsidies are not available, for example for services provided by private operators, such constraints on fares will result in reduced investment by operators and in a diminished supply and poorer quality of service.

39. It is commonly assumed that subsidies to public transport are progressive, ie that the poor gain more from the subsidies than the better off. Few studies have been undertaken to verify this perception, despite the often considerable cost of the subsidies. In practice, it is possible that the subsidies are regressive. This has been shown to be the case in Australia (Duldig et al 1993 and Amos et al 1984). While the circumstances differ substantially, subsidies may be regressive in Asian cities if, for example, poor people make fewer or shorter trips on subsidised public transport than higher income groups. Similarly, the subsidies will be regressive if poor people make relatively more use of un-subsidised public transport, for example those provided in local areas by private operators using small motorised and non-motorised vehicles. It seems likely that the provision of general subsidies for formal public transport on the grounds of social equity is, at best, a blunt instrument for helping poor people. At worst, it is regressive. The subsidies will also generate more use of public transport than is optimal unless the subsidies are justified by the presence of externalities or on the basis of public transport being a merit good.

40. The price of existing urban transport also affects the viability of future, related projects. For example, existing fares for subsidised public transport will limit the fares that a prospective bidder can charge for a competing privately-financed project. This could weaken the prospect for implementation of the proposed project.

41. Unlike public transport patrons, road users do not pay a specific charge for use of roads. Accordingly, prospective investors considering a toll road must contend with road users who have the option of using ordinary roads at zero direct cost or of paying a fee to use the toll road. Only those users who value the difference in the quality and duration of a trip between the ordinary road and the toll road will transfer to the toll road. This requires that there be considerable congestion on the ordinary road system so that the toll road can offer a significant saving in travel time. It also requires travellers to place a high value on their travel time.

42. For these reasons, there is no relationship that can ensure that the cost of a toll road can be recovered. Moreover, the revenue from the toll road will be vulnerable to improvements that reduce congestion on the ordinary road network. As a result, opportunities for using private funding for profit-oriented urban toll roads is likely to be confined, at best, to cities where congestion is severe and where personal income is high. Such conditions will rarely exist in small to medium size cities.

43. There is widespread interest in emerging technology that will enable all vehicles to be charged for their use of the road system. The technology is being initially used for tolled facilities, but the potential exists for it to be used on all roads in the long term. This would remove one of the impediment to the financial viability of privately-financed urban road projects. However, it is unlikely to be implemented in small to medium size cities in the foreseeable future, and may even be impractical in larger cities. Second best means for road pricing tend to be blunt instruments, and thus have a considerably lesser effect on optimising transport demand.

4. Public Transport Infrastructure and Operations

44. Governments are generally considered to be responsible for ensuring the provision and operation of fixed transport infrastructure. It has not always been this way. The first public transport systems were provided by the private sector in the early nineteenth century in cities such as London and New York. By the middle of the nineteenth century most major American cities had privately-provided rail-based public transport services (see Smerk 1979). The services were often provided to facilitate the development of land in locations that otherwise had poor accessibility. The evolution of technology (steam trains, cable cars, electric streetcars, buses and then automobiles), amongst other factors, resulted in a continuing process of challenge and obsolescence. Most fixed track systems eventually faced financial difficulties, and were transferred to public ownership.

45. Public transport in general now attracts considerable political patronage, and its provision is protected through licensing arrangements. Potential inefficiency by the protected service providers, and the provision of services using inappropriate technologies, increase the pressure for subsidies or higher fares. Conversely, though, government regulation of fares and the stickiness of increases in fares puts pressure on operators to minimise costs in the short run: it also reduces funding for investment, and increases costs in the long run because of the higher cost of sustaining deteriorating infrastructure.

46. The modes of transport that have emerged over time have been increasingly flexible and, for bus and car in particular, without significant economies of scale. As indicated earlier in this paper, the case for government provision of public transport services is weakened if there are no economies of scale. However, governments have commonly cited other reasons such as social equity and externalities to justify public support for and regulation of public transport. Common user stopping places and terminals for urban public transport are useful for passengers. However, they also have the character of monopolies that warrants government involvement in their provision.

47. Fixed track public transport systems, with their economies of scale and posited positive externalities, also require government sponsorship. They may be implemented either by a government agency or corporation as has occurred in Hong Kong and Singapore, or could be provided by the private sector under licence. Such systems will rarely be able to achieve cost recovery (including a return on the invested capital) on the basis of the revenue from fares and property development. If these facilities are to be built by the private sector, it is necessary for government to make a financial contribution that is sufficient to allow the private sector organisation to be profitable on the basis of the revenue that they can collect.

48. Even then, it is likely that government will retain control over fares, and hence indirectly over the revenue of the private sector organisation. In these and other respects, such private sector investment is unlike that generally conceived of in competitive markets. It requires a rare and unique partnership between government and the private sector, and may explain in part the difficulty in implementing the ambitions for private sector investment in fixed track public transport systems in cities such as Bangkok and Manila.

49. With the exception of major projects, many governments have recognised that their role in urban public transport can be confined to ensuring the provision of services, ie it is not necessary

for governments provide the services. Thus, for-hire passenger services can be provided by the private sector, with subsidy and under licensing arrangements if such measures are warranted.

50. It is of note that where flexibility is allowed, private sector operators commonly seek to provide differentiated services to separate segments of the public transport market. Private sector operators also make greater use of smaller vehicles which enable the provision of more specialised and frequent services. Such vehicles may also be favoured because they are sometimes mass produced and hence may have relatively lower capital costs than for large buses which are manufactured in smaller batches.

51. The emergence of differentiated public transport services illustrates the heterogeneity of the public transport market, ie it is not a single commodity. The ability to segment the market provides the opportunity to increase the quality of service for those prepared to pay higher fares. It may also slow the drift from public transport to car travel by providing travellers with public transport options that are attractive to them as their incomes rise. This could reduce the pressure on governments to provide general subsidies to public transport by allowing the provision of services for which no subsidy is justified by the private sector. If the subsidisation of public transport is the only effective means for providing the urban poor with mobility, governments could provide subsidies for services that are specifically directed to this segment of the market.

5. Road Infrastructure and Operations

52. As indicated previously, the current method of charging for the use of roads makes it difficult, if not impossible, for the private sector to develop and recover the cost of roads. Other characteristics of urban roads have also traditionally required their provision by government:

- Roads are expensive, long lasting and have little alternative use.
- Development of a road network requires a long term view and the power to designate land for transport corridors and to enforce land acquisition.
- Roads are used by all manner of transport and for other purposes as well. Given the importance of mobility and the other social and economic uses of roads in peoples' lives, there is a community expectation of unimpaired access to roads.
- There are some economies of scale in the provision of roads. This arises in part because there is a minimum scale at which they can reasonably be provided. Additional road capacity can, however, generally be added only in lumpy and increasingly expensive increments.
- At low levels of use, roads have the character of a public good. That is, use by one person does not diminish the capacity of others to also use the road and hence the marginal cost of using the road is zero.
- Even if it was politically and socially acceptable to charge people for their specific use of the road system, it has not been technically feasible to do so to date.

53. These conditions have traditionally required governments to take responsibility for the financing and provision of roads and for ongoing road operations. The conditions do not necessitate that government undertake the actual work, and there is a long history of governments contracting out much, and sometimes all, construction and maintenance of roads to the private sector. This provides an indirect means for mobilising private finance for road infrastructure as it relieves governments of the need to invest in plant and equipment.

54. It is common for there to be inadequate maintenance of transport infrastructure. This results in more rapid deterioration of infrastructure than should be the case, and increases the cost of the infrastructure as earlier re-investment becomes necessary. Similarly, poor use of the infrastructure will reduce its effective capacity. In many cases, therefore, improved maintenance and operations are preferable to mobilising additional funds for more infrastructure.

55. In most cities, improved management of existing roads will need to be supplemented by provision of additional road capacity to accommodate future traffic growth. Two developments are challenging the traditional arrangement of public provision of this additional capacity. In the first instance, governments have not been able to respond adequately to the rising demand for mobility. The resultant increasing congestion and economic cost have led people to seek new ways for securing additional road capacity. The second development has been the presence of private sector financial resources seeking investment opportunities. By offering to build expressways on which tolls can be charged, the private sector has overcome, to some extent, one of the traditional constraints to the private provision of roads.

56. As indicated previously the prospects for privately-funded toll roads in small to medium size cities are negligible. Practical measures to enhance road infrastructure in these cities will therefore need to be oriented to make better use of existing roads, by seeking increased allocations from higher levels of government and by generating more funds locally.

B. Key Issues for Financing Transport Infrastructure

57. Previous sections of this paper note that the private sector already plays the key role in the financing of mobile transport infrastructure and in providing transport services. This role could be enhanced. Moreover, while governments have traditionally been responsible for providing fixed transport infrastructure, there is an increasing awareness of the opportunities for the private sector to participate in these activities. There remain, however, a number of reasons why the private sector cannot substitute for the government in all cases, particularly the provision of fixed infrastructure. Making better use of urban transport infrastructure and increasing the mobilisation of funds for investment in the infrastructure therefore requires cooperation and understanding between the private sector and government.

58. Given this background, the key issues related to the financing of urban transport infrastructure can be distilled into those pertaining to: (i) what infrastructure should be provided, (ii) how this infrastructure should be financed; and (iii) the appropriate roles of government and the private sector.

1. Infrastructure Needs

59. The private sector should be able to provide public transport vehicles and services. Even so, this will generally require governments to provide an enlightened regulatory environment to support and sustain private sector investment. It is improbable that private markets can adequately provide either public roads or public transport systems that require dedicated tracks such as busways and rail systems. However, these facilities could be provided by the private sector with government support. Clearly, any project could be made profitable for the private sector if sufficient subsidy is provided. It is therefore necessary to determine the infrastructure that it required. This is a key responsibility of government. Determining infrastructure needs and priorities needs to take into account issues such as:

- Current pricing of urban transport, in particular the provision of subsidies for public transport, the level and structure of charges imposed on road traffic, and the mis-perception by people of the cost of transport all result in distortion of transport demand that generally increases the level of demand above that which is optimal.

Improvements in pricing will reduce and restructure the demand for transport infrastructure.

- Providing a higher quality of service than people are prepared to pay for will require subsidies. Conversely, provision of a minimum level of service only will result in some potential needs being unmet. Segmenting the transport market allows the needs of people to be better served and for resource mobilisation to be increased. The private sector will be better able to identify and respond to the needs of these individual market segments.
- The efficiency of operation of the urban transport system affects the quantity of infrastructure that is required. It will commonly be more efficient to invest resources in improving the efficiency with which existing infrastructure is used than to invest in additional infrastructure. This can be achieved, for example, by improving the management of traffic operations and parking.
- There is a need for government to undertake infrastructure planning on a comprehensive and consistent basis. Having identified infrastructure development needs in this way, it is then possible to seek the most efficient means to finance and implement projects.
- A study of private provision of public infrastructure in Australia noted that neither public nor private sector provision of infrastructure is inherently preferable. The options of public ownership, contracting out, BOOT-type arrangements and privatisation have characteristics that make them relatively more attractive in different situations (EPAC 1995). Accordingly, the key concern should not be whether the project is financed by government or the private sector, but rather the most efficient means to implement the project in the form that was evaluated, ie at the same cost and using the same charges and other assumptions.

2. Mobilising Funds for Infrastructure

60. Most countries face constraints in the resources available for funding road and public transport infrastructure. Additional resources can be mobilised from either users of the transport system through tolls and fares, from government in general (including indirect taxes and charges on users of the transport system) and from the private sector. Specific measures to generate more funds for investment include:

- Increasing fares on public transport to ensure that providers are able to generate sufficient revenue for investment, and re-investment, in fixed and mobile infrastructure.
- Allowing the private sector to provide public transport services as much as is possible and with the least possible economic regulation. This arrangement will increase the prospect that costs will be minimised, that services will meet the needs of users, that fares will generate sufficient revenue to meet costs, and that private sector savings are mobilised for investment in urban transport.
- Developing more direct means for helping the urban poor than through the provision of general subsidies for public transport. As a second best solution, segmentation of the transport market allows government to ensure that a basic level of service is available. This service could be provided either by government, but could probably be provided at lower cost by private operators under licence. The view that subsidisation of such a minimum level of service is warranted as a means of aiding

the urban poor needs to be critically appraised. The private sector can provide other public transport services which are more specifically targeted towards meeting the needs of better-off people on a commercial basis.

- Having identified infrastructure development needs through comprehensive urban transport planning, governments can seek private sector participation in the financing and implementation of project proposals. It is likely that few, if any, of these projects will be commercially viable. It is therefore necessary to determine arrangements whereby the cost of the project does not exceed that on which the project was justified and to minimise the government's contribution to the cost of the project. The latter can be best achieved by seeking competitive bids from the private sector to finance and implement the project (and operate it if appropriate) with the least financial contribution from government.
- Contracting out construction and maintenance of transport assets owned by governments can, with good management, reduce costs and can release funds invested in assets such as plant and equipment that government would otherwise need to own.
- Tolls should be used for urban roads where possible. As tolls are additional to other taxes and charges paid by road users, it will be possible to impose them only where a project will confer a significant advantage to those who use the facility rather than the ordinary road system.
- More generally, taxes and charges on road vehicles and fuel should be developed to better reflect the cost of providing roads and managing the traffic system and the external costs arising from vehicle use. This will ensure better use of the road system, and hence avoid the need for an excessive amount of infrastructure.
- While most of the expenditure on roads in small to medium size cities is made by local governments, the principal bases for transport-related taxes and charges occur at a national or regional level. To some extent this occurs because, for example, it is impractical to impose fuel taxes at a city level. Yet, without a clear arrangement for the allocation of revenue from these taxes and charges to urban transport and a sharing of this revenue with all levels of government, there is a risk that small to medium size cities will not secure sufficient funds for road investment. There is also the potential for local government to assume greater responsibility for enhancing its revenue collection and for increasing investment in transport infrastructure.

3. The Role of Government

61. Governments commonly assume a wide range of obligations in urban transport. Improving urban transport financing requires a clearer focus on those activities which the government alone can undertake, and taking greater advantage of the resources and skills of the private sector for other activities. Hence:

- Governments must be responsible for transport planning to ensure that infrastructure development needs are formulated on a consistent basis, are integrated with land use development and are in accordance with government objectives.
- As far as possible, governments should assume the role of facilitators for the development and operation of urban transport. They should make the greatest possible use of the private sector for the financing, provision and operation of

transport infrastructure and services, if need be through licensing and contracting arrangements.

- Where it is essential that governments be involved in the provision and operation of urban transport, the services should be provided with the greatest possible efficiency to minimise costs and should meet the needs of customers to maximise revenue.
- Where the private sector may be able to take a major role in financing and developing fixed infrastructure, governments will probably need to take contribute towards the cost of the project and will need to initiate and manage the process of private sector participation.

C. Conclusion

62. The traditional pattern of government provision of fixed trunk urban transport infrastructure is dominant around the world. It is unlikely that this will change substantially, particularly in small to medium size cities. Even though there are opportunities for cost sharing with the private sector, governments will continue to face the challenge of mobilising sufficient resources to finance the development and operation of key elements of the urban transport system.

63. Even so, recent experience with measures such as commercialisation, contracting out, privatisation and private provision of public infrastructure suggests that there is, potentially, a greater role for the private sector in areas of urban transport considered the domain of governments in the past. Such private sector participation does not absolve governments of their responsibilities. Indeed, it places an increased need on governments to focus on transport policy, strategy and planning for which they alone can take responsibility, and on which the effective development of the transport system is dependent. Moreover, it is likely that only governments have the authority that is necessary to address community concerns. Increasing use of private sector finance places new demands on governments, though, including the need to coordinate activities, to do so on a transparent basis and to be subject to greater external scrutiny.

IV. CASE STUDIES - ANALYSIS AND ISSUES

A. Introduction

64. A range of measures have been implemented in various cities around the world to finance the development of transport infrastructure that respond to the conditions described in previous chapters. Some examples are described in following sections. The case studies are intended to illustrate measures that have been used and which could have broader application. An attempt has been made to avoid duplication of examples used in other papers prepared under the current RETA. Five broad areas of urban transport activity are considered: roads; mass transit; other public transport infrastructure; public transport operations; and pricing and regulation.

B. Case Studies

1. Roads

65. As indicated in Chapter II, road investment is constrained by the lack of explicit allocation of transport-related tax revenue to roads, by current difficulties in charging directly for roads, and by competition from other uses for public sector funds. Use of private sector funds for road development is limited primarily by revenue constraints because of the untolled nature of the remainder of the road system and by the complexities of negotiating agreements with governments that balance risk and reward.

66. Nevertheless, there are still a range of ways in which funds can be mobilised to finance development in the roads sector (see Table 3). In addition to the traditional forms of government funding, there are several means which have been used relatively little to date.

67. Governments have, for example, made little use of new taxes to generate additional income to pay for the cost of roads. However, the increase in land value that occurs in the vicinity of new and upgraded roads offers a potentially efficient and equitable base for such a new tax. Property taxes, even if applied effectively, capture only a small share of this increase in land value. Betterment taxes provide the opportunity to recover a much larger share of the cost of projects. Indeed, it may be easier to apply betterment taxes in small to medium size cities as it should be easier to delineate the effects of road projects on land values in the simpler urban environment.

68. Local governments usually have the capacity to borrow funds. The extent of this capacity may differ between countries in accordance with the powers accorded to local government. These powers are usually determined by national governments. Where borrowing is possible, there may be a number of ways in which it can be accomplished. Arrangements have been established in some countries for local government to borrow funds from a government supported scheme. For example, the Municipal Development Fund has been established in the Philippines largely using seed money from World Bank loans to the national government. On the other hand, the increasing sophistication of the financial markets provides the opportunity for a bond market to develop.

69. Local governments have, however, generally been reluctant to borrow money for road development. No specific examples have been identified in the current review. In the Philippines, though, the City of Naga has been exploring the use of bonds to raise funds for road development, but the project has not yet proceeded to implementation.

Table 3
Methods for Funding Road Development

Funding Options	Comments
Government Resources	
Grants from higher levels of government	A traditional source of funding which is influenced, in part at least, by the greater revenue collection powers of higher levels of government.
Local government budget	Also a traditional source of funds, although local government commonly does not generate sufficient funds to make a large contribution to infrastructure financing.
New local tax sources	The opportunity exists to use new, appropriate sources of funding such as betterment taxes and fees. However, while often proposed, betterment taxes are rarely practiced in Asia. This suggests that there has either been a lack of will, or that the tax is impractical.
Borrowing from government agencies	Some agencies of national governments may be able to provide loans to local government for infrastructure development. Local governments commonly prefer to borrow only for infrastructure that has the capacity to generate local tax revenue.
Borrowing from commercial financiers	The development of financial markets offers new opportunities for government to borrow from commercial organisations using a range of financial instruments.
Contracting out services	Privatising government organisations that undertake road construction and maintenance, and contracting out the activities provides the opportunity to both reduce costs and to mobilise private sector resources.
Private Sector Resources	
Land consolidation	Consolidation or land re-adjustment can be used to allow the enhanced value of developed commercial land to be used to fund the development of local roads.
Private provision of access and estate roads	Private sector resources can be mobilised to fund access roads and roads within private estates. Government regulation will be required to ensure that this occurs.
BOOT-type schemes with tolls	Private sector resources can be used to finance, construct and operate roads for which tolls can be imposed and sufficient revenue collected to meet the cost of the project. Full cost-recovery may be rarely achievable in practice.
BOOT-type schemes without tolls	To avoid the need to stop traffic and collect tolls for privately-financed roads, it is sometimes proposed that “shadow” tolls be imposed. These involve the government paying the toll on behalf of the road users. However, this negates the role of tolls in influencing driver behaviour.
Shared Resources	
Subsidised BOOT-type schemes	It is likely that most BOOT-type schemes will involve some form of government contribution or guarantee.
Other forms of cost sharing	In order to improve accessibility to land with development potential, the land owners may contribute land and money for road construction in conjunction with government expenditure.

70. Rather than borrowing for road development, local government has generally preferred to borrow for projects that generate direct revenue such as markets and bus terminals. This should not be surprising as they rarely have any taxes that will, as a result of a road project alone, directly generate sufficient additional revenue to service the debt incurred for its construction. There is a need for local government to be convinced that worthwhile road improvements can increase economic activity to the extent that borrowing is justified, ie that sufficient revenue can be secured from indirect taxes and from other improvements in local resource mobilisation for debt servicing. It also reinforces the need for better means for imposing charges on road users and for distributing the funds between the various levels of government with responsibilities for roads.

71. As discussed in the previous chapter, contracting out road construction and maintenance offers the opportunity for government to relinquish the need to hold and manage a substantial amount of plant and equipment. The extent to which individual agencies contract out maintenance and construction at present varies considerably, but the general trend is to increase the amount. An example of one aspect of this trend has been the recent privatisation of the plant pool of the road agency of the Government of Victoria in Australia (see Box 1). In addition to the substantial reduction in the capital stock that was held by the government, it is expected that the ongoing cost of construction and maintenance will decline because of improvements in the productivity of the plant and equipment.

72. A particular problem for road development in cities is the non-primary roads, especially the secondary roads which provide access to land development and connectivity between sub-areas of cities. Residential, commercial and industrial land development is proceeding rapidly, and is generally taking place in the absence of credible land use plans and associated site-controls. Furthermore, the pace of land development is such that the form of cities is being irreversibly changed with large tracts of land developing along the primary road corridors further from the city centre.

73. At the same time, large areas of land, even though close to the city centres, are being bypassed because of the absence of the secondary and collector roads (and other basic infrastructure). This is the now familiar problem of the “superblocks” which contribute to inefficient land development, long commutes and congestion. For example, it was found that nearly 70 percent of all land converted to urban uses in Bangkok in the late 1980s was taking place more than 20 kilometres from central Bangkok and in areas without adequate infrastructure (Halcrow Fox 1991). A similar pattern of development is occurring in many Asian cities.

74. There should be considerable potential for the private sector and local government to finance construction of these secondary and collector roads. The general rule in most cities is that a developer is responsible for the provision of local roads within a development. There is a strong incentive for property developers to expect governments to pay for higher class roads. It is possible, though, for governments to require the developers to meet the cost of providing much of this infrastructure, including facilities such as traffic signals or even interchanges at junctions of secondary roads and arterial roads. In practice, it could be in a developer’s interest to share, if not pay for the full cost, of providing such links as it could accelerate the process of improving accessibility and could be used to influence the design of the link to better meet the specific needs of the developer. An example of this approach is presented in Box 2.

75. A variety of arrangements can be made to share the cost of road projects between government and the private sector. This will be facilitated by the presence of clear and consistent guidelines for such cost sharing. The public interest will be served by ensuring that the process of negotiating agreements is transparent.

Privatisation of Plant and Equipment, Victoria, Australia

Government highway agencies in Australia have, on average, contracted out about half of road construction but a much smaller share of maintenance. The current trend is towards greater use of contractors for both road construction and maintenance. In doing so, the agencies have a reduced need for plant and equipment.

VicRoads, the highway agency for the state of Victoria, is responsible for a road network of some 24,000 kilometres. In the past it has contracted out a larger share of road construction (about 70 percent) than other states in Australia. Even so, the agency's Plant Hire and Technical Services Group (which acted as an internal business unit for the provision of equipment) had an inventory of some 3,000 major items of plant and equipment and a further 1,500 lesser items. The replacement and depreciated values of the major items of plant and equipment was US\$110 million and US\$34 million respectively. (All prices are January 1996 values.)

In August 1993 registrations of interest were sought from the private sector for the purchase of the Plant Hire and Technical Services Group as a going concern. Ten submissions were received and three of the interested parties were short-listed as potential purchasers. The business which was eventually to be sold was valued at about US\$32 million based on the net present value of its estimated future cash flow. In March 1994 the Corporation sought public tenders for the sale of the business and the hire-back of certain equipment. The sale of the business was concluded later that year at US\$35 million. Selling the plant, equipment and depot did not require special legislation. The proposal was reviewed in the same manner as other major expenditure decisions.

As part of the sale, VicRoads signed a five year contract with the company that won the tender for the supply of plant and equipment for construction and maintenance work that the agency is still undertaking itself. The cost of hiring the plant and equipment in this manner is about US\$0.5 million less than the equivalent cost had been when it was owned by VicRoads because of improvements in efficiency. Hence, in addition to the substantial one-off gain from the sale of the plant and equipment, the VicRoads will gain a continuing benefit from lower costs. The funds thus released will enhance its capacity to fund road development and maintenance.

76. Toll road projects are under active consideration and development in many cities of Asia, including Shanghai, Manila, Bangkok and Jakarta. These roads are significant investments (with costs in the order of US\$20 million per lane-kilometre - although the cost can vary considerably). While governments may consider unsolicited proposals for these projects, such bids suggest that their planning has either been deficient (in that the project was not previously identified) or that the project is of questionable value. Either of these explanations indicate a need for governments to have a planning capability that can provide well-formulated transport development plans and is able to critically appraise other proposals that may arise. It is vital that governments know the projects for which they wish private sector involvement, and that they have a clear process to secure the best provider of the project. This should reduce the risks to both the public and the private sector.

77. In particular, governments need to consider how to safeguard the public interest and to ensure that the project that is to be implemented with private sector participation is consistent with that which was originally conceived and found to be economically worthwhile. Difficulties that governments are likely to face will include: (i) providing a stable environment and thus reducing commercial risks; (ii) managing the desire of the private sector to transfer risks associated with future costs and revenue to the government; (iii) determining the appropriate means for providing financial support to a project that will not be self-financing; (iv) ensuring an adequate amount of transparency in the bidding process and, more generally, managing its relationship with the firms

Underpass of Jl Jenderal Sudirman, Jakarta, Indonesia

As a requirement for a development approval, a consortium of private sector firms was required to pay the full cost of constructing an underpass and associated interchange with the major arterial road, Jenderal Sudirman, in Central Jakarta in 1991/92. The project provided access to their major commercial and hotel developments, and cost about US\$7 million.

The underpass has four traffic lanes and sidewalks (albeit narrow), and provides full ramp connections to Jenderal Sudirman. Built with an adequate 5 metres height clearance, it functions as a public facility by connecting to a new four lane, east-west, sub-arterial road which was built under the World Bank assisted JUDP-1 urban transport project for the Jakarta DKI, the local government. Thus, the underpass while providing access to land parcels held by the private developers on both sides of Jl Sudirman, also provided significant public benefits - some 35,000 vehicles per day use the new road, most of which have no business in the developments owned by the private companies who provided the construction funds. The underpass required no special legislation but had to be built to a high standard because it was to be used by the public at large. After construction, completion was handed over to Jakarta DKI to maintain.

There are similar projects elsewhere, for example the Tomang Flyover in Jakarta. At the Future Park Shopping Centre at Rangsit, Bangkok, a full interchange is being provided on associated land parcels owned by the Sathorn Thani Group of companies. At a cost of some US\$5 million plus the associated land, the interchange is being designed to the full standards of the Thai Department of Highways and will be handed over to them after construction. In all of these cases, the projects will confer significant private and public benefits. The projects require the public agency to accommodate private sector needs and to take a long-term view of access needs in an area rather than approve piece-meal access solutions.

which are potential concessionaires; (v) establishing contractual arrangements that are robust enough to last for the duration of the concession (possibly thirty years); and (vi) given the socially sensitive nature of toll fees (which may even require Cabinet approval for changes), determining procedures to implement revisions to allow for inflation and other agreed factors. Finally, the government may be faced with difficulties in its relationship with a concessionaire if there is a need to make changes and improvements to other elements of the transport system, for example on a parallel, non-tolled route. Clearly, some improvements must continue to be made to the non-tolled network, but defining what is acceptable to both sides is not easy and is possible only in the context of an overall framework.

78. As indicated previously, it is unlikely that toll road projects will be profitable. Those that are profitable are usually fixed links such as tunnels and bridges for which there is no convenient alternative. Governments will usually need to provide incentives to offset costs or to assist in enhancing revenue if projects are to be commercially viable. This can include direct financial participation by government, provision of the right-of-way (such as in Bangkok), and providing for a pooling of revenue sources from an existing and a new facility (as occurred in the case of the Sydney Harbour tunnel in Australia where the investor in the tunnel was also able to retain toll revenue from the existing, parallel Sydney Harbour Bridge). In terms of financial participation, government agencies may wish to borrow to assist a project but may not have the power to do so. An appropriate capital market must also exist. Governments may choose not to apply an explicit charge on users of the proposed facility, but may instead prefer to use a shadow toll whereby it pays the concessionaire on the basis of the usage of the project. Box 3 provides a case study of toll roads in Jakarta, Indonesia that illustrates some of the matters discussed above.

Toll Roads in Jakarta, Indonesia

(Source: Drawn and quoted from Procon Indah/JLW 1994). The Jakarta Master Plan 2005 prepared by DKI Jakarta provides general guidelines for developing Jakarta as the centre of social and economic activities of the JABOTABEK (Jakarta, Bogor, Tangerang and Bekasi) region. Consistent land and infrastructure regulations are necessary for the implementation of the Plan. Since the issue of the Plan, DKI Jakarta has released a number of regulations for land use control and other building and property development requirements. Governor Decree No. 678/1994, issued in June 1994, provides incentives for developers of commercial areas around city centre nodes and primary centres. It relaxed building intensity regulations in those areas, but requires developers to participate in building improved infrastructure such as bridges, pedestrian links, roads, sewerage, and other facilities in the vicinity of their developments.

Government Regulation (Peraturan Pemerintah) No. 20/1994, also issued in June 1994, is directed to facilitating infrastructure development, particularly high cost projects, in Indonesia. It provides an incentive for foreign and local private investors to participate in the construction of public utilities, such as ports, telecommunications and railways. Investors may participate in these projects through a Public Private Partnership agreement, such as BOT (Build Operate Transfer), BOO (Build Operate Own) or BTO (Build Transfer Operate).

A major focus of Jakarta's road infrastructure development is the construction of the Jakarta Outer Ring Road (JORR) and the Harbour Toll Road. The former is the subject of this case study. The JORR and the Harbour Toll Road projects are being developed as BOT schemes.

JORR is a 58 km toll road which will be connected to the north western and north eastern ends of the Harbour Road. It is currently under construction and will be completed in 1998. The 2-way, 6-lane toll road will have an average capacity of 120,000 vehicles daily. The JORR feasibility study estimated that the toll road would reduce the distance between the eastern and southern part of Jakarta by approximately 11 km; and would reduce travel time by about 75 percent. It is also expected to improve accessibility within the inner city and to industrial areas, and to ports and the airport.

Increased land acquisition by the public and private sectors, both for infrastructure and property development, has already led to an increase in land values, even though the project is still under construction. Along the southern part of JORR, specifically in the vicinity of Jalan TB Simatupang, land values are reported to have increased by approximately 35-40 percent per annum since 1991. It is expected that improved accessibility will increase the attractiveness of residential districts and regional retail centres served by the JORR and the inner-city toll road, in particular in the outer fringes of Jakarta. This will accelerate decentralisation of the city.

The concessions for the construction and operation of the toll roads are given by Jasa Marga, the Government's agency for planning and implementation of toll roads. It is intended that the projects be financed primarily from toll revenues. Whether or not this can be achieved is unclear. There will be other beneficiaries of the projects, land owners in particular. Normal land taxes will not recoup a significant proportion of the large development benefits which will arise from the project.

The JORR is being implemented within a reasonably clear masterplan for the entire toll road network, but there is no agreed network for non tolled roads, in particular the secondary and collector roads. In the absence of adequate secondary infrastructure, land development has been attracted mostly to the outlying areas of the city, leaving large tracts of undeveloped land closer to the city centre. The initial increases in accessibility of outlying areas will be reduced rapidly by traffic generated by the new developments and by the absence of suitable local road networks.

79. It is improbable that toll roads will be an option for enhancing road development in most small to medium size cities. Hence, priority needs to be given in these cities to measures such as: (i) developing means for securing adequate land for future road development needs; (ii) maximising private sector contributions to road development through land consolidation and contributions to the development of access roads; (iii) contracting out road construction and maintenance to reduce costs and to better focus the road management activities of government; (iv) to increase local resource mobilisation by borrowing and by increasing local revenue; and (v) reforming the charging mechanisms for use of roads and the distribution of funds generated between the levels of government with responsibilities for roads.

80. Acquisition of land for transport corridors can be a major problem. In some countries alignments for future roads cannot be reserved, and outright purchase is required. This requires significant funds because of high, and rising, land prices and the possible need to acquire the land well ahead of the time it is required. Instruments such as land readjustment may be effective means for securing land for roads in some instances, particularly in areas with little development. However, the development of more effective means for securing land for major transport corridors in built up areas may be an indirect means for facilitating the financing of road projects.

2. Mass Rapid Transit

81. While not necessarily pertinent to small to medium size cities, the high population density, rising traffic congestion and increasing economic wealth of larger cities will encourage them to consider the role of mass rapid transit systems (see Allport 1995). Smaller cities such as Chiang Mai in Thailand and Surabaya in Indonesia (with populations of 0.5 and 3.0 million respectively) as well as a number of similar size cities in China are also considering, or have plans, for the development of such systems.

82. For the purpose of this paper, mass rapid transit (MRT) is defined generically as a public transport system which can carry large numbers of people and which uses a dedicated fixed track. A range of technologies can be used, for example various types of busway and light through to heavy rail systems. The broad cost and capacity of elevated MRTs are:

- busways - either bus roads or guided track facilities - which can carry up to 20,000 people/hour/direction, with a cost of US\$10-15 million per route-kilometre; and
- light rail transit (LRT) and heavy rail which can carry 20,000 to 50,000 people/-hour/direction, with a capital cost of from US\$25-75 million per route-kilometre.

83. The process of developing MRT systems is lengthy as the projects are extremely expensive and are complex in financial, engineering, environmental and political terms. Only a few projects have been implemented in the last two decades. Amongst DMCs of the Bank, these have included an LRT line in each of Metro Manila (see Box 4) and Kuala Lumpur, underground lines in Shanghai and Beijing and a rail line in Calcutta. Metro systems have also been developed in the two high-income Asian city-states of Hong Kong and Singapore.

84. By the traditional economic criteria of economies of scale and externalities, mass transit projects are best suited to public sector development. Yet, their cost makes them difficult to justify and for governments to fund. These circumstances have also made it attractive for governments to seek private sector funding for such schemes, even while they make it difficult for them to be developed by the private sector without financial assistance from government. MRT systems cannot be commercially viable under the conditions that exist in most cities if and the dominant revenue source is from the fare box (Fouracre et al 1994). Even in Hong Kong, where major land development around stations was planned and capitalised on, the profits contributed only about 15 percent of total revenues. Very few cities have sufficiently high land prices and severe enough congestion to emulate the Hong Kong experience.

Manila Light Rail Transit Line 1, Philippines

(Source: Drawn and quoted from Esguerra 1994). As early as the 1960s, the strategic transport development plans for Metro Manila called for the introduction of a upgraded and integrated public transport system, with rail-based systems providing trunkline services and buses used as feeders to link outlying areas with train stations. Efforts were also exerted to replace the para-transit modes, particularly jeepneys. However, it was not until the beginning of the 1980s that a decision was made to develop Line 1 of an LRT system.

This elevated 15 km LRT line on a north-south orientation runs along the second most heavily travelled corridor in the metropolis. Earlier studies indicated that while the line came out in the evaluation as the second-best alignment for immediate development, it was selected instead of the higher ranked EDSA Line (LRT Line 3) for social considerations. The LRT Line 1, which can accommodate 18,000 passengers per hour per direction, commenced operations in December 1984 and cost US\$170 million (1986 prices).

The line has performed exceptionally well by international standards. It enjoys high utilisation rates, with daily ridership increasing from 191,400 in 1985 to 355,700 in 1993, an annual growth rate of about 8 percent.

The project was financed largely with bilateral loans, some of which were linked to equipment procurement. The combined effect of the high cost of the project, currency risk associated with the foreign loans, and under-capitalisation of the Light Rail Authority (the government corporation responsible for the development and operation of the system) has left the Authority hard-pressed to service the debts and the depreciation of its assets. Its debt-to-equity ratio rose to 10:1 from 5:1 in 1989. Notably, the fare box ratio (gross revenues divided by direct operating expenses) has remained a relatively high 1.5, despite low fare levels (P6.00 or US\$0.22/passenger journey since 1991).

85. Although MRT systems would not normally be expected to be financially viable, a well planned and appropriate system could still produce net economic benefits, mainly from savings in personal travel time and from reduced negative externalities from other forms of transport. Whether passengers are willing to pay to realise the potential travel time benefits is vital to the veracity of the valuation of project benefits, and hence the viability of projects.

86. In performance terms, busways can provide similar performance to LRT or heavy rail as shown by the example of busways in Ottawa (Canada), Adelaide (Australia) and in Brazil, notably Curitiba (Allport 1995 and Fouracre et al 1990). Busway systems are also cheaper to build and operate, and are more flexible. But buses have an image problem. Similarly, busways are not thought to have sufficient capacity for the ultimate needs of a city, although in reality busways provide all the capacity that will be required in most cities. For example, the maximum demand on Singapore's MRT system (a heavy LRT) is 25,000 people/hour/direction, only just beyond that capacity of a busway. In addition, a busway corridor could be converted to light or heavy rail should the additional capacity be required at a later time - this can avoid the need to invest in a more expensive system that may have more capacity than will ever be required.

87. It is likely that LRT and heavy rail will not be needed for many years for capacity reasons in even large, secondary cities, nor will they be affordable. Financing will be dependent on substantial government subsidy. However, the lower cost and similar potential benefits of busways make it more likely that they could be commercial propositions, as was found recently in a study of busways in Bangkok (Asian Engineering Consultants 1994).

88. With or without MRT, the back-bone of urban public transport systems will continue to be road based public transport. Public transport typically carries over half of the person trips made

each day in Asian cities (compared with 10 percent or even less in many cities in developed countries). In indicative terms, a city of 8 million people could generate some 10 million public transport trips each day. With annual growth in travel demand of 4 percent, average daily demand could increase by 400,000 trips each year. An elevated LRT capable of carrying this number of passengers could cost in the order of US\$400 million. As such lines can be developed only periodically, road based public transport will need to carry most of the future growth in passenger transport demand.

89. The implementation of a reasonably extensive MRT, at a cost of several billion US dollars, may accommodate up to 15-20 percent of total passenger trips. Most of these trips will be made by former public transport travellers, and many will involve a transfer between MRT lines and other modes of public transport. That is, the presence of MRT will not have a major effect on the demand for car travel, and will still leave some 40-50 percent of all trips using road-based public transport for at least some of their journey (Halcrow Fox 1991 and Fouracre et al 1994).

90. While the development of mass transit rail systems is unlikely to be warranted in other than the megacities, experience indicates some lessons for the development of systems in smaller cities. These include the need for capable government planning and management of urban and transport systems, private-public partnerships to ensure that the maximum development potential is gained from projects, and an ability to capture a large proportion of development and consumer benefits to contribute to the funding of projects. This need not, and is perhaps unlikely to involve, different funding and taxation practices than are available at present. The innovation will come in bringing together these practices in new and effective ways.

3. Public Transport Terminals

91. Besides the development of roads and mass transit systems, there is a need for investment in other fixed infrastructure for public transport such as stops and terminals.

92. Kerb-side stops are vital pieces of route infrastructure for a fixed route bus system as most passenger boarding and alighting occurs at them. Stops could consist of a passenger shelter and seat on the footpath, passenger information and a marked bay, but in Asian cities commonly contain few if any of these facilities. At heavily used stops on major arteries, associated infrastructure such as a pedestrian overbridge may be necessary. In many cities in developed countries, the private sector may contribute to the provision of some or all of this infrastructure through advertising or as a demonstration of community goodwill. Examples include the donation of more than 20 passenger shelters in 1991-93 by a cigarette manufacturer in Yangon (Myanmar), and payment by local Chambers of Commerce for bus shelters in Thailand (although this mainly occurs in provincial areas where the Chambers can be readily identified with a local community). Advertising space on buses and at bus stops can also be sold by bus operators. For example, in Bangkok in 1992, the government operator (the Bangkok Metropolitan Transit Authority), let a concession for the private sector to handle all advertising on the 800 air-conditioned buses running on its routes.

93. In larger urban areas with complex public transport networks, there is considerable value in common user terminals and stopping areas for public transport. These will generally be off-street. In regional cities, terminals are often developed to provide an interface between long-distance and local services. The terminals provides people with improved options for interchanging between services, and a single location at which people who may not be well-informed of available services can be reasonably sure of finding the service that they require. The provision of better information to users and easy access to a range of services also fosters competition and improved public transport services. However, such common users terminals may need to be used by most public transport operators to be effective. Even then, many of the benefits are in the form of externalities that are difficult to recover through user charges. The financial viability of terminals is therefore

commonly poor. Moreover, to avoid the cost of using the interchanges, public transport operators have an incentive to stop near but not at them. This further reduces their financial viability, and increases traffic congestion around them.

94. Terminals are commonly developed in conjunction with markets and large shopping centres. The combination of a large generator of demand with an integrated transport facility provides a mutually supportive development. Even with this added benefit, the public transport terminals are still rarely commercially viable if all costs (land, capital etc) are taken into account. However, they may become viable if the land is donated (PPK 1991).

95. Ideally, governments could prevent unreasonable use of streets for terminal activities, or could charge a fee commensurate with the cost of providing expensive road space for this purpose. Public transport operators would then need to use special facilities which could be developed on a profitable basis by the private sector. However, this may still require a major role for government. The best location for off-street interchanges will be in central locations in towns. However, it is likely that private sector developers will find it both difficult and expensive to obtain land in such locations. There is a role for government to use its powers with respect to land use and transport planning to balance competing interests, and hence to facilitate the development of such common-user facilities in the most appropriate locations.

96. The more common practice, though, is for local government to develop a terminal, often at the periphery of a town, and to require bus operators to use the terminal. In some instances, terminals may be developed on land donated by a private sector owner. The attraction to government of such a donation is that it may, in conjunction with compulsion for public transport to use the terminal, make operation of a terminal financially viable. However, the land may commonly be donated because the owner wishes to enhance the value of neighbouring land. While such a donation may enhance the financial viability of a terminal, the economic merit may be poor as passenger access costs and public transport operating costs may be increased as a result of the terminal. It may be observed that many terminals in Asian towns are located on land poorly suited for this purpose, but with the main advantage that the land was available. That such badly located terminals are chosen is easy to understand, but the on-going costs to the travelling public heavily outweighs the initial cost saving.

97. Many of the funding approaches described in Table 3 for roads can be applied for public transport terminals, including use of loans, bonds and BOOT-type schemes. An example of the use of a loan to fund the development of a terminal is described in Box 5.

4. Public Transport Vehicles and Operations

98. Government involvement in the provision of public transport services requires considerable capital investment in vehicles, depots and other ancillary facilities. The cost of government operation of such services is commonly higher than occurs under private sector operation. In the same way that contracting out road construction and maintenance can improve the mobilisation of funds and reduce costs (see Box 1), so too can the contracting out of public transport services. This has been undertaken to a considerable extent in countries such as the United Kingdom, New Zealand and Australia. The key to the success of the approach is the use of competitive tendering to ensure the lowest price and transparency in the legal and financial arrangements within a clear policy and planning framework to ensure that issues such as service quality, safety and social equity are taken into account (see Box 6).

99. Governments may thus continue to be responsible for ensuring the provision of public transport in major cities. However, by contracting out provision of the services, governments can allow the cost of public transport to be reduced and can facilitate the use of private sector funds for investment in public transport. In this situation, the key tasks for government are to act as a

Municipal Development Fund Financing for Bus/Jeepney Terminal, Tagum, Philippines

(Source: Jucaban 1995). In the course of the 1980s a number of urban development programs were initiated in the Philippines. Two in particular addressed integrated urban planning in small to medium size cities - the Regional Cities Development Program (RCDP) and the Program for Essential Municipal Infrastructure, Utilities, Maintenance and Engineering Development (PREMIUMED). As a result of these programs, a Municipal Development Fund (MDF) was established to provide loans to towns and cities for infrastructure development. The MDF has used funds from World Bank loans to the national government to provide seed money for the lending program. Loans to a city are packaged with some grant assistance for the development of infrastructure in the city for which the national government is responsible, together with a program to enhance locally generated revenue.

In 1991, a complementary Local Government Infrastructure Fund (LGIF) was initiated by USAID. The objective of the LGIF was also to lend for infrastructure development projects, but to use the leverage of its contribution to secure private sector financial participation in projects. While lending for other sectors also, both the MDF and the LGIF provided funds for similar transport sector projects such as bus and jeepney terminals and municipal roads and bridges.

An example of a transport project was the integrated development in 1995 of a bus/jeepney terminal and a public market in the town of Tagum in Davao Province. The market, which cost US\$1.9 million, was funded by a loan from the MDF. The LGIF provided a grant of US\$0.9 million to concrete selected unsealed roads to improve access to the terminal which was located adjacent to the market on a site at the edge of the town. The Province of Davao Del Norte provided a further US\$0.8 million to concrete other roads that led to the terminal. These funds were complemented by expenditure of US\$1.2 million for the bus/jeepney terminal by the Province of Davao Del Norte and the Davao Financing Corporation. Both the market and the bus/jeepney terminal are expected to recover their costs.

The integrated development of these projects (through the near concurrent development of both projects and their location by one another) should enhance their value.

facilitator by contracting out services where government subsidies are involved and by providing a suitable regulatory environment where services are supplied in competitive markets.

100. Taxis are a major element of the public transport system, and may carry 10-20 percent of all passenger travel by motorised vehicles (Sayeg 1992). They provide a high quality service that meets the needs of specific segments of the transport market, eg for occasions when the higher quality of service is needed and for specific socio-economic groups. In the past, policies have usually limited taxi numbers and have been reluctant to allow increases in fares. As shown by the case study of taxis in Bangkok (see Box 7), opening access to the taxi industry to new entrants can provide a range of significant benefits, including a dramatic rise in mobilisation of funds for investment in the sector.

101. The investment in public transport vehicles used in cities is substantial. This investment is made primarily by the private sector. As illustrated by the case study of taxis in Box 7, the best means for mobilising and sustaining this private sector investment is to ensure that fares are sufficient to allow owners to recover their capital investment and meet operating costs in a competitive market. Minimising entry controls to the public transport industry is vital to achieving this, as it ensures that pressure for fare rises do not reflect inefficiency in the industry, but rather legitimate costs that need to be recovered.

Competitive Tendering of Public Transport Services, Adelaide, Australia

(Source: Passenger Transport Board 1995). Since the mid-1970s, all public transport services in Adelaide (a city of 1.1 million people) have been provided by a government agency. The services have been provided by 740 buses, 20 light rail cars and 110 rail cars. In the face of the rising subsidy required for public transport and declining patronage, the government decided in 1993 to introduce innovation into the delivery of public transport services. This was to be done by competitive tendering for the provision of services. It involved:

- Passing a Passenger Transport Act (enacted in July 1995). The Act described revised institutional arrangements for the regulation and management of public transport throughout the state of South Australia. It covered all modes of for-hire passenger transport, including taxis.
- Removing the policy functions from the former government public transport agency and reforming the agency as a commercial public transport operator (named TransAdelaide);
- Creating a new Passenger Transport Board (PTB) which was responsible for public transport policy, arranging for the provision of public transport services in Adelaide through a process of competitive tendering and other regulatory functions related to passenger transport such as safety and service quality.

With respect to the contracting of bus services, Adelaide was divided into 10 regions. For practical reasons, the PTB is staging the calling of tenders for the provision of bus services in each of these areas over about 3 years. Tenders are called separately for each service area. The PTB specifies the fare levels and the minimum level of service that is to be provided, and invites bidders to indicate: (i) a "Basic Price" that they seek in order to provide the minimum level of service regardless of the number of people carried; and (ii) an "Incentive Component" which is related to the number of people carried. The contracts have a duration of 5 years to allow periodic competition and testing of prices. To accommodate the short contract period, the government has retained ownership of major fixed assets such as depots and the guided busway track which are leased to successful tenderers.

TransAdelaide is able to compete with the private sector. Competitive neutrality is achieved by adjusting bids by TransAdelaide to allow for taxation privileges that it receives as a government corporation. Tenders for two of the service areas have been awarded to date, one to TransAdelaide and the other to a private sector operator.

It is expected that the new arrangements for the provision of public transport services will reduce operating costs by 20-25 percent.

102. There has been relatively little formal study of informal public transport in cities in Asia. Governments have a negligible role in financing investment in this sector. While it appears that there are some owners with reasonably large fleets of vehicles such as motorised and pedal tricycles and rickshaws that are used, it also appears that small private investors play a major role in providing these non-motorised and small motorised vehicles. As illustrated with the case study of taxis in Box 7, open entry to the industry and ensuring that fares are not artificially constrained to below the level required to achieve cost recovery is the most effective means for facilitating and sustaining the mobilisation of funds by the private sector for investment in such transport.

Taxi De-regulation in Bangkok, Thailand

Until mid-1992, the number of taxis which could operate in Bangkok was capped at 13,500 vehicles. The fleet was generally old, with the most common vehicle being Toyota Corollas dating from the late 1970s. The situation could be characterised as an owners' market where the supply of willing drivers greatly exceeded the available fleet. Drivers paid a rent to the owners of vehicles of about Baht 450 (US\$18) for an 8 hour shift. This fee included all costs except that of fuel. Fares were negotiated with passengers and minimum fares were about Baht 40. The public perceived these fares to be high.

Taxis were usually in short supply during peak periods. People able to secure a taxi had to pay a negotiated premium fare. The old vehicles, most of which were nominally air conditioned, were generally in poor condition. The image of the taxi system was poor. There was, however, little incentive for owners to change and they opposed suggestions that new operators be permitted to enter the market. Taxi licences commonly changed hands at about Baht 0.5 million per vehicle.

In early 1992, the Land Transport Department decided to liberalise the taxi market by allowing any person with an appropriate driving licence and a passenger car less than two years old and in satisfactory mechanical condition to apply for a permit to own and operate a taxi. All taxis were required to have meters and regulated fares were to apply. The previous fare structure was retained, but the level of fares was set slightly lower. For example, a flag fall fare of Baht 35 was applied. The balance of the fare was made up of time and distance components, although the time component still inadequately takes into account the levels of delay routinely experienced in Bangkok. Some negotiation of fares continued in particularly congested areas. Taxi rental costs declined to about Baht 300-350 per shift. Drivers also derived an advantage from the better availability of vehicles and the larger numbers of owners.

Within a year of implementation of the policy, the taxi fleet had grown to 35,000 vehicles. The number has continued to climb, to about 40,000 taxis in mid-1995. The change in regulation resulted in the old taxi fleet becoming valueless, and the previous large owners lost most of their investment. In their place, there are today some 800 companies, nine cooperatives and many individuals. The public benefited from the increased availability of taxis, an improvement in the quality of service and from lower fares.

While some vehicles have been purchased with cash, most were bought with a deposit of about 40 percent of the vehicle price and a loan for the remainder. Most drivers are understood to have been content with their income at first, perhaps in part because the cost of maintaining the new vehicles was low. However, vehicles are now beginning to look noticeably older, with associated increases in maintenance costs. Traffic congestion had also increased. This is resulting in new demands for fare increases, which to date have been resisted by the government. It is now common for taxis to refuse long trips in preference to more lucrative short trips, to refuse passengers altogether, for vehicles to not be available at peak times, and for drivers to seek to negotiate fares.

To some extent, the increased number of taxis has contributed to rising congestion in Bangkok, particularly in the central area. The present fleet would perform some 6 million vehicle-kilometres per day, some 10 percent of the total vehicle-kilometres of travel on the Bangkok road network (up from 2-3 percent in 1992). The liberalisation of the taxi industry brought significant consumer benefits, but added to the social costs of transport through increased congestion and emissions.

After undergoing rapid transformation in response to the policy changes in 1992, the taxi industry is again facing the traditional challenges of an aging fleet, a fare structure inadequate to ensure long-term sustainability and the rising costs imposed by Bangkok's severe traffic congestion. Government has an important role in negotiating with the industry a new fare structure that provides sufficient incentives for owners and drivers to continue to provide reasonable services while looking after the public interest.

103. While no documented material has been found in the course of preparing the current paper, it also seems probable that there are a range of credit schemes besides family savings whereby the private sector can finance acquisition of public transport vehicles. Equally, it is likely that there is potential to enhance these credit arrangements to further improve the mobilisation of investment capital. The World Bank is current supporting a scheme in Lima (Peru) to assist people purchase bicycles, although the scheme is for personal ownership rather than as a means for developing public transport. The World Bank is also preparing a proposal for a project to improve the design of rickshaws in Bangladesh. It would be a natural extension of such a project to support the enhancement of credit facilities for the purchase of any improved vehicles that may be developed.

104. The trend towards greater liberalisation of the regulatory environment for public transport has sought to increase competition for the market (ie competitive tenders) or in the market (allowing the market to respond to users' needs in the most efficient manner). These measures have the potential to relieve government of the burden of financing urban public transport, to enhance resource mobilisation and investment by the private sector, and to reduce the cost of providing public transport services. Moreover, increased competition should lead to a greater variety of services which are better able to meet the specific needs of different groups of users. Experience indicates that people are often prepared to pay considerably higher fares for superior service. This will improve the level of cost-recovery, and will allow operators to make further investment in vehicles. It may also slow the drift from public transport to car travel.

5. Pricing and Regulation

105. Governments have a considerable indirect effect on investment in transport infrastructure through their regulation of prices and of transport operations, as indicated in the previous section. If prices are too low, insufficient funds for investment will be generated and the quantity and quality of infrastructure will fall.

106. Politicians are inevitably concerned by the need to increase prices that are regulated by government. However, postponing potentially regular, small increases has three consequences: (i) investment and possibly maintenance are postponed, leading to deteriorating infrastructure and higher costs; (ii) people adjust their location, travel and mode choice decisions as a result of the changes in relative prices, possibly in ways that are inefficient and unattractive in the longer term; and (iii) prices must eventually be increased by a considerable amount to account for the accumulation of changes that must be made. The latter effect results in a stop-go type situation typified by the situation with taxis in Bangkok (Box 7). Investment in transport infrastructure will therefore be fostered by ensuring that controlled prices, where such control is necessary, are adjusted regularly.

107. The nature and influence of transport prices was discussed in Chapter III of this paper. Historically, taxes and charges imposed on motorists have been set more on the basis of general taxation principles. In economic terms, the objective of imposts on transport users should be to improve transport efficiency by ensuring that people make their travel decisions on the basis of the value of the resources consumed. In practical terms, there is also a need to generate sufficient revenue to meet the cost of providing the services consumed. However, charges on road users are commonly treated as general revenue by governments, that is they are considered as taxes rather than as charges for use of the transport system. The result is that there is no direct relationship between the fees and investment in the transport system.

Road Vehicle Taxation Reform, Indonesia

(Source: World Bank 1995). Policies relating to the use of road infrastructure affect the need for road investment and the efficiency of the road transport industry. This case study concentrates on current proposals in Indonesia to change road user charges to improve transport efficiency.

The Government of Indonesia has adopted a general “user pays” approach to road pricing, as set out in its 1989 Policy Statement and Action Plan on Road Infrastructure and Road Traffic and Transport. The objectives of the policy are broad based and include efficiency in transport, cost recovery from various categories of road users, and the mobilisation of increased resources for the maintenance and development of the network. The policy is focused on the road infrastructure costs incurred by the government through its highway departments at the central and regional level.

Prior to this policy, taxes on road transport included: (i) initial purchase related taxes (import duty, VAT and in some cases luxury goods sale tax on new vehicles; (ii) an ownership transfer tax when used cars change hands; (iii) an annual registration fee or motor vehicle tax (the PKB) set by the national government and collected by the traffic police on the behalf of the provincial governments; and (iv) use related taxes (including import duty and VAT on spare parts, tyres and lubricants) and an implicit fuel tax. Traditionally, these taxes were levied as a source of general government revenue and their level and structure were not determined primarily by considerations of efficiency and cost recovery in transport.

A major consequence of past policies has been that taxes on trucks, which cause most road damage and require the construction of strong pavements, were low. While the Short Term Action Plan aimed at rapid progress in correcting this situation with regard to heavy commercial vehicles through a combination of increases in the price of diesel fuel and of the annual motor vehicle tax, implementation has been much slower than anticipated.

From the point of view of implementing a road user charges policy with the tax instruments available in Indonesia two features are noteworthy. First, the tax component implicit in fuel prices is significant in the case of gasoline, but is low for diesel for which the pump price only just covers its resource cost and has been below this value in the past. Thus commercial vehicles have enjoyed an implicit subsidy. This subsidy has been reduced by an increase in the price for diesel fuel in 1993. Secondly, revenue from the ownership transfer tax - which is collected at the regional level and is the main source of revenue for provincial governments - is higher than revenue from the annual vehicle registration fee. Since this tax is not related to road use, the plan has been to progressively reduce this tax while, in parallel, increasing the annual vehicle registration fee. Provincial government support for the revised road user taxation regime has been lukewarm because of its implications for their finances.

Notwithstanding the above issues and difficulties, there have been some noteworthy achievements. First, during the period of the Stage I Action Plan three price increases resulted in the price of regular gasoline rising from Rp 385 in late 1989 to Rp 700 in January 1993, while automotive diesel increased from Rp 200 to Rp 380). Second, the rates of the annual motor vehicle tax were raised in January 1992 by an average of approximately 45 percent and by a larger amount in 1994.

Cost recovery by vehicle category is still very unbalanced, with more than 80 percent of tax receipts coming from small gasoline-fuelled vehicles. Taxes on trucks remain marginal, and the annual motor vehicle tax still penalises some vehicle types and configurations which cause relatively less cost to the road system. The Stage II Action Plan, therefore, proposes a change in the basis for the annual motor vehicle tax for commercial vehicles from an approach based on vehicle engine size and year of manufacture to one based on road pavement damage potential. This is to be followed by further increases in the tax. However, this change, which would result in an increase in the annual vehicle tax for a 2-3 year old, two axle truck of 6500cc/20 tonnes GVW from about Rp 0.5 million to Rp 2 million, is being resisted.

108. Concerns regarding the economic efficiency of current road pricing generally relate to four issues: (i) the relative level of cost-recovery for different classes of vehicle, especially large vehicles; (ii) the balance between taxes on fixed and variable elements of vehicle operating costs; (iii) the perception of prices that road users actually pay; and (iv) the cost of negative externalities such as pollution and congestion. The last three of these items are more commonly raised as issues in developed countries, but are equally pertinent to developing countries.

109. It is common in Asian countries for taxes on large vehicles not to reflect the higher cost of accommodating the vehicles on the road system. The issues is generally understood, but the dimension of the structural change in road user charges that it implies makes implementation of the necessary changes difficult. This is illustrated by the recent experience in Indonesia (see Box 8).

110. In the same manner that bus services can be contracted to the private sector, it is possible to contract out other regulatory activities also to relieve governments of a considerable administrative and investment task. As an example, a component of the Thai Government's Action Plan to reduce air pollution and, in particular, emissions from motor vehicles (MOTC 1994) involves the strengthening and expansion of the scope of inspection of private vehicles. This is being implemented by using a network of privately operated but publicly certified inspection stations to conduct inspections (see Box 9). As with other forms of contracting out activities, there is a need for governments to develop suitable means for managing the contracted arrangements to ensure contract adherence.

111. The private sector may also have a role in the implementation of traffic management measures. For example, the private sector in certain precincts of many cities collects parking charges (eg Surabaya, Indonesia) but at present this is mainly a revenue and employment creation device. At a larger scale, the private sector could contribute to the implementation of a sound parking policy that is a part of overall transportation policy, developed by the public and/or private sector in partnership. The use of increasingly sophisticated traffic management systems as being considered in numerous cities (Manila, Shanghai and Bangkok) could be operated by the private sector.

Private Vehicle Inspection, Thailand

The Ministry of Transport and Communications (MOTC), through the Land Transport Department (LTD), is responsible for administration of the Land Transport Act which governs the regulation of the bus and truck operations, including vehicle registration and testing, crew licensing, and route licensing. The Police and the Department of Highways (DOH) have a shared responsibility for enforcement. Since 1988, LTD also has had responsibility for vehicle licences and driving licences for small vehicles (cars and motor cycles) under the Motor Vehicles Act (MVA). Again, the Police and the DOH have a shared responsibility for enforcement. The current example concentrates on the contracting out of vehicle testing.

At present, LTD concentrates on inspection of buses and trucks registered under the LTA. Inspection of cars, motorcycles and other vehicles registered under the MVA only occurs upon registering the vehicle and change of ownership. The inspection covers only administrative matters such as checking the engine and chassis serial number. Yet many of these 8 million vehicles are in poor condition with regard to safety features and many emit excessive smoke, other types of emissions and noise.

On 1 July, 1994 fifty-eight privately operated inspection centres commenced operations in the provinces of Bangkok, Samut Prakan, Nonthaburi, Pathum Thani, Nakhon Pathom and Samut Sakon. The centers are approved by LTD and are authorised to inspect cars older than 10 years and motorcycles older than 7 years. The inspection considers safety and emission conditions of the vehicles. The owners of the vehicles are required to take them for inspection prior to renewal of their annual registration. Although 210 firms had applied to operate inspection centers most were unable to commence operations on the initial date.

LTD expected that some 700,000 cars and 570,000 motorcycles needed inspected each year. This is a demanding task, and concerns have been expressed about the ability to maintain the quality of inspections. As the centres are distributed over a wide area, supervision and enforcement of the system is difficult.

It is intended that a computerised data network will be established to monitor the performance of the inspection centers and the quality of inspections and maintenance of vehicles. The data network will seek to combine selected data from the inspection centers with LTD's vehicle history records, and may also be connected to other data-bases involving drivers, on-road enforcement activity, accident records etc to provide a comprehensive management and monitoring system for LTD, Department of Pollution Control (DPC) and other relevant bodies.

As part of the Fifth Highway Sector Project supported action plans, the DPC, LTD and police will upgrade on-road enforcement particularly with regard to emissions from all vehicles. A key item to ensure success is the on-line availability of accurate information on all details of vehicles, drivers and owners for enforcement teams and those groups involved in vehicle inspection and vehicle registration.

C. Distilling and Interpreting the Experience

112. A number of issues emerge from the review of experience and analysis of opportunities for the financing of urban transport infrastructure:

- There is relatively little documentation of innovative practices for financing urban transport infrastructure in Asia. This limits the propagation of successful practices.
- Development of transport infrastructure involves not just raising more capital to develop additional fixed infrastructure, but also improving the quality and effectiveness of existing infrastructure. This is not a new stricture, and has been promoted for many years.
- Transport policy, pricing and operational practices have a major bearing on the demand for transport infrastructure and on the mobilisation of capital. This is perhaps less well recognised, although the increasing contracting out of services and interest in road pricing indicate a heightened awareness of the importance of these matters.
- The private sector is already a major investor in urban transport infrastructure through its investment in road vehicles. Indeed, it appears that its investment almost certainly exceeds that of government. Both macroeconomic and transport sector policies of government are important in providing a stable environment in which the private sector can fulfil its potential role.
- Private sector investment in fixed transport infrastructure needs to occur within a clear planning context that is provided by government. It is also likely that the investment will generally occur in conjunction with investment by government in the same or related projects. This increases the complexity of involving private sector finance, and makes it more vital that the involvement be undertaken on a transparent and efficient basis.
- Investment in sustaining and developing urban public transport can be enhanced by minimising entry controls to the industry, by allowing a range of transport services to be provided, and by ensuring that tariffs are not unnecessarily constrained.
- There is considerable opportunity for governments to contract out many of the remaining activities that they currently undertake to both mobilise investment capital and to reduce costs.
- There is, in general, a need for government to be the facilitator of urban transport development and operations.

113. Finally, the case studies describe practices with which people will generally be familiar. That is, there are relatively few truly innovate practices, just good practices that could be applied more widely. The innovation primarily relates to taking advantage of the best respective roles for governments and the private sector to develop the partnership that is required for effective urban transport.

V. DIRECTIONS FOR REFORM

114. Although the practices that can result in increased and more efficient mobilisation of capital for investment in urban transport may be generally well known, they are often not practiced as widely or effectively as should be possible. This suggests the need, and opportunity, for more general and consistent application of what is already known. There is a particular need to recognise the major role that private sector investment already plays in urban transport, and of the role of government policies and practices in supporting this role.

115. The extent to which potential practices are not used suggests that decision-makers are either unaware or unconvinced of the merits of the measures. This suggests, in turn, that there is need to better develop and articulate an urban transport finance strategy that can provide a more effective and sustainable basis for future development of the sector. Such a strategy could comprise six elements, as described in following paragraphs.

1. Devolving Responsibility for Urban Transport

116. Responsibility for urban transport should be devolved to the lowest level at which it can be practically undertaken. This will ensure that it can be as responsive as possible to the needs of consumers, can avoid the higher cost and remoteness that can result from decisions that are made at higher levels, and should allow innovation to be implemented more rapidly and flexibly. Thus, national governments should seek to devolve responsibility for roads and public transport in cities to the governments responsible for those cities. Governments at all levels should seek to devolve responsibility to the private sector for all activities except those where the cost of market failure exceeds that of government failure.

117. Under this arrangement, governments should concentrate on those activities that cannot be undertaken by the private sector, and thus focus on the critical task of being facilitators for the development and operation of urban transport rather than on being the providers and operators of transport services. There will be a corresponding need to ensure that local authorities also promote efficient urban transport rather than sectional interests.

2. Developing Transport Infrastructure Development Strategies

118. Government has a vital role to play in planning and guiding the development of cities. With respect to the development of fixed urban transport infrastructure, this requires good planning that takes into account the network effects of transport, interactions with land use development policies, social and environmental considerations and coordination with development in other sectors, in addition to the recognition of explicit economic costs and benefits. It also requires consistent and rigorous evaluation procedures to ensure that projects are prioritised and that the most worthwhile projects are identified for implementation.

119. Identifying projects in this manner has two advantages for mobilising capital for investment in transport infrastructure: (i) by identifying the most worthwhile projects, the providers of the capital can be assured of the best possible returns to their investment; and (ii) such analyses will identify community service obligations and externalities which are the responsibility of government, and which thus need to be taken into account when formulating privately financed projects. Subject to the government policies described in the next sub-section, it appears that private capital is readily mobilised for investment in road vehicles.

3. Developing An Appropriate Regulatory, Pricing, Financing and Administrative Framework

120. Governments have a major impact on the mobilisation and effectiveness of investment in urban transport through their management of the sector. Issues that need to be addressed are:

- Consistency and Certainty. The return on an investment in transport infrastructure is dependent on future income over the life of the asset. If private sector investment is to be encouraged, there is a need for governments to maintain consistent and sustainable policies that can provide investors with some certainty regarding future conditions, and hence the confidence to invest.
- Regulation. Governments should regulate transport markets only where deficiencies that arise from market imperfections exceed those that result from government intervention. Where intervention is necessary, consideration needs to be given to the relative merits of alternative means for regulating the transport market, in particular the use of direct controls (such as prohibitions and minimum requirements) and the use of indirect measures (such as prices and taxes). Where possible, governments should use regulatory practices that allow as much diversity and flexibility as possible and that make the cost of regulation explicit.
- Pricing. Appropriate pricing is vital in ensuring that people make the best use of transport infrastructure. It also generate the revenue that provides a return on the capital that is used for investment in fixed and mobile transport infrastructure. As far as possible, governments should allow efficient transport markets to determine prices. Governments should keep entry to transport markets as open as possible to ensure that operations in the industry are efficient. This is particularly important where intervention in setting prices is considered necessary. Controlled prices need to be responsive to changes in costs to attract and sustain investment.

As far as possible, government should expect that all transport operations should be undertaken on the basis that revenue will cover all costs, including a return on capital. The need for subsidies should be justified with care, in particular to demonstrate rather than assert that the beneficiaries of the subsidies are the most needy (and that the subsidy is the most effective way of supporting these people) and to ensure that the subsidies can be sustained over the longer term.

- Finance. In addition to developing a closer correspondence between the price and cost of using transport infrastructure, there is a need for better linkages between the revenue that is collected and the cost of providing and operating the infrastructure. Where possible, taxes and charges should be devolved in accordance with responsibility for transport infrastructure. Where is this not possible, transfers should be made between those who are most appropriately placed to respectively collect revenue and be responsible for the infrastructure.
- Administration. In keeping with its core function as a facilitator of urban transport, governments should seek opportunities to contract out discrete activities that can be undertaken by the private sector and managed on a contractual basis. Governments will need to develop skills in managing such contracts. Activities that can be contracted out include the provision of public transport, road construction and maintenance, and could include other activities such as vehicle registration and inspection and traffic management.

4. Securing the Best Means for Provision and the Best Providers of Transport Infrastructure

121. Transport infrastructure can be provided in various ways, including public provision, contracting out to the private sector, BOOT-type schemes and private sector provision. There is a need for governments to better understand the relative merits of these approaches and the strengths and weaknesses of using private and public sector funds. In general though, recent experience suggest that there is the opportunity to make better use of the private sector in the provision of urban transport infrastructure and services.

122. Even if it is appropriate for the private sector to provide more transport infrastructure than occurs at present, it is likely that much of it will not be able to occur on a profitable basis. For this and other reasons, it is likely that governments will continue to be responsible for regulating fixed transport infrastructure services. Efficient provision of transport infrastructure by the private sector will therefore be dependent on the use of competitive and transparent tendering processes to select the private sector organisation.

5. Developing Capital Markets

123. The private sector has considerable financial resources available for investment in fixed transport infrastructure. However, the ready availability of funds may be related to an expectation of public guarantee for the investment. Investment in fixed transport infrastructure will generally require long term finance (possibly for up to thirty years). As this is a longer term than is common on capital markets, there will be a need to develop knowledge and confidence in the markets to facilitate the provision of funds on a commercial basis and with minimum risk premium.

124. It is likely that the private sector will continue to undertake most investment in road vehicles. There is a need for investments that range from modest amounts for non-motorised vehicles to larger sums for taxis and buses. This range provides the opportunity to mobilise savings from sources that range from individuals to formal capital markets. Allowing this diversity of transport and financing mechanisms can provide the greatest potential for resource mobilisation, and should be encouraged. Opportunities to improve the competitiveness and hence efficiency of these sources of capital will also facilitate investment, particularly for access to capital by small investors.

6. Undertaking Research, Development and Promotion

125. Many of the proposals discussed previously require research and development to better determine the best ways to increase the mobilisation of capital for investment in transport infrastructure. However, even if this knowledge is developed by professionals, there is a need to disseminate the information. In particular, there is a need to provide decision-makers with sufficient evidence to support, and to promote, proposals for change that will enable more capital to be mobilised more efficiently for investment in transport infrastructure.

Bibliography

- Allport, R.J. (1995). "Transport Management - Private Demands and Public Needs", prepared for the Regional Seminar on Megacities Management in Asia and the Pacific, Asian Development Bank, Manila.
- Amos P. and Starrs, M. (1984) "Public Transport Subsidies in Adelaide", in *Forum Papers for the 9th Australian Transport Research Forum*, Adelaide, May.
- Asian Development Bank (1995). "Regional Seminar on Megacities Management in Asia and the Pacific", 24-30 October, Manila.
- Asian Development Bank (1989). "Review of the Scope for Bank Assistance to Urban Transport", Manila, October.
- Asian Engineering Consultants (1994). "Public Transport Network System Study", Bangkok.
- Bray, D.J. (1995). "Transport Strategy for Adelaide - Background Report", Adelaide, Australia, September.
- Duldig, P.J.M. and Gaudry, B.P. (1993). "The Equity Incidence of the State Transport Authority Subsidy in South Australia: An Update", in *Proceedings of the Australian Transport Research Forum*, Volume 18, Part 2.
- Economic Planning Advisory Commission (1995a). "Private Infrastructure Task Force Report", Canberra, September.
- Economic Planning Advisory Commission (1995b). "Interim Report of the Private Infrastructure Task Force", Canberra, May.
- Esguerra, George (1994). "Balanced Urban Transport Development: Opportunities for Metro Manila", in *The Wheel Extended*, Toyota Quarterly Review No. 88, July.
- Fouracre P R, Allport R J, Thomson J M (1990). "The Performance and Impact of Rail Mass Transit in Developing Countries", Transport and Road Research Laboratory, Research Report 278, United Kingdom.
- Gallagher, R. (1992). "The Rickshaws of Bangladesh", The University Press, Dhaka.
- Halcrow Fox (1991), "Seventh Plan Urban and Regional Transport Study - Executive Summary", Prepared for NESDB, Thailand with support from UNDP/ World Bank.
- Jucaban, A. (1995). "The Local Government Infrastructure Fund (LGIF) in the Philippines", presented to the International Seminar on Integrated Urban Infrastructure Development, New Delhi, 1-4 February.
- Midgely P (1994). "Urban Transport in Asia", World Bank Technical Paper No. 224, Washington, DC.
- Ministry of Transportation and Communications (1994). "Action Plan to Reduce Vehicle Emissions and Noise Pollution, Bangkok, Thailand.
- Passenger Transport Board (1995). "Competitive Tendering and Contracting of Metropolitan Adelaide Public Transport Services - Information Paper", Adelaide, March

PPK Consultants (1991). "Study of Inter-City and Rural Bus Transport", prepared for the Land Transport Department, Bangkok.

Procon Indah/Jones Lang Wootton (1994). "Property Research Paper - Jakarta's New Infrastructure", Jakarta, December.

Roth, G. (1987). "The Private Provision of Public Services in Developing Countries", The World Bank, Washington D.C.

Sayeg P J et al (1992). "Assessment of Transportation Growth in Asia and Its Effects on Energy Use, the Environment, and Traffic Congestion: Case Study of Bangkok, Thailand", prepared for the International Institute for Energy Conservation, Washington.

Smerk, G.M. (1979). "The Development of Public Transportation and the City", in *Public Transportation, Planning, Operations and Management*, ed. G.E. Gray and L.A. Hoel, Englewood Cliffs, N.J., Prentice-Hall.

World Bank (1995). "Road Study - Indonesia (Draft)", October.

World Bank (1994a). "Thailand: Mitigating Pollution and Congestion Impacts in a High-Growth Economy", Country Economic Report, February.

World Bank (1994b). "Environmentally Sustainable Development - Transport Sector Policy Review (Draft)", Washington D.C., September.