

The World Bank

A Tale of Three Cities:
Urban Rail Concessions in Bangkok, Kuala
Lumpur and Manila

Final Report

2nd December 2004

Halcrow Group Limited

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ACRONYMS

ADB	Asian Development Bank
BL	Bangkok Blue Line
BMA	Bangkok Metropolitan Administration
BMCL	Bangkok Blue Line Project Company
BMTA	Bangkok Metropolitan Transit Authority
BLT	Concession – Build Lease Transfer
BOO	Concession – Build Own Operate
BOT	Concession – Build Operate Transfer
BTS	Bangkok BTS concession
BTSC	Bangkok BTS Concession Project Company
DB	Design build (turnkey) contract
DBKL	KL Municipality
DLR	London’s Dockland’s Light Railway
DOTC	Philippines Department of Transport’n and Comms
EIA	Environmental Impact Assessment
GOJ	Government of Japan
HK	Hong Kong
Hopewell	An aborted concession project in Bangkok
IFC	International Finance Corporation
JBIC	Japan Bank for International Cooperation
JEXIM	Japan’s Export-Import facility
KCRC	Kowloon Canton Railway Corporation (HK)
KfW	Germany’s ODA window
KL	Kuala Lumpur
KLIA	Kuala Lumpur International Airport
KTM	Malaysia’s national railway (runs commuter services)
LRT	Light Rapid Transit
LRT1	Manila’s first LRT line
LRTA	Philippines Light Rail Transit Administration

MCX	Manila – Calabarzon Express concession
Metro	Short-hand for MRT
MMDA	Metro Manila Development Authority
Monorail	KL’s monorail concession
MRT	Rail-based Mass Rapid Transit unless otherwise specified
MRT2	Manila’s second MRT line (publicly procured)
MRT3	Manila’s first MRT concession
MRTA	Mass Rapid Transit Authority of Thailand
MRTC	Manila’s MRT3 Project Company
MTRC	Mass Rapid Transit Corporation (HK)
NEDA	Philippines National Economic and Development Authority
ODA	Overseas development assistance
OECF	Japan’s Overseas Economic Cooperation Fund (now in JBIC)
Operating costs	Operations + maintenance + administration costs
PFI	UK Private Finance Initiative
PPP	Public Private Partnership
PRC	Peoples Republic of China
PSP	Private Sector Participation
PUTRA	KL’s automated transit concession project
STAR	KL’s first MRT concession
MRT3	Manila’s MRT concession project
SOE	State Owned Enterprise
SPNB	Malaysia’s asset company (with PUTRA/STAR assets/ ops)
TOR	Terms of Reference

COSTS

Unless otherwise specified costs are presented in US\$ converted at contemporary exchange rates (defined in Annex A).

Executive Summary

This study of MRT concessions policy is a background paper to a flagship study of infrastructure service provision in East Asia and the Pacific. It concerns the role of private concessions in developing urban MRT¹ systems in East Asian cities. It is primarily founded on the experiences of Kuala Lumpur, Bangkok and Manila and the comparator cities London, Singapore and Hong Kong.

ES.1

The Case Study Experience

There is widespread and deep support for MRT development in the case study cities and more widely, as a core component of sustainable city development. MRT fits with a range of policy agendas and support for it is – and is likely to remain, robust. While the MRT experience has disappointed governments in some ways, there is no evidence this support is reducing – if anything the converse. The question facing many city fathers is how to develop MRT systems rapidly. This provides the context for consideration of the subject matter.

The private concession procurement route was usually supported as ‘the obvious way’ – in the expectation that such projects would deliver major benefits at little or no cost to the public finances. We have studied the success of six MRT concessions in the case study cities, from the viewpoints of their users, governments and financiers.

Our broad conclusion is that these concessions have achieved much, even when the enabling environment has been poor. This is an important conclusion. It results from impressive performance by private sector entrepreneurs. The projects have been implemented, operate successfully and large numbers of people benefit day-in and day-out. The main beneficiaries are the passengers, but other road users benefit from somewhat reduced congestion and pollution; and governments increasingly recognise that these projects are opening up policy options that previously did not exist. There is some evidence that they have accelerated government’s understanding of the need to manage public transport and the urban transport system as a whole.

We conclude that most projects would be judged beneficial were a post-evaluation carried out, that without private concessions most projects would not have happened or they would have happened much later; and that had government implemented them, they may not have been as successful. Timing is very important in rapidly changing developing cities. Projects implemented now deliver

¹ MRT – Mass Rapid Transit - is used as shorthand for urban rail systems that carry a mass ridership rapidly. They include metros and light rail transit (LRT) systems that are segregated from other road traffic.

benefits now, and open up strategic opportunities that can progressively shape the city's development path for the better.

But there are problems. The projects have not achieved all that governments hoped. In part this was because governments' expectations were unrealistic. Some expected MRT systems to 'solve' congestion and to improve public transport widely, without the complementary policies that are now recognised as necessary – these expectations were unrealistic. So too was the expectation that concessions would avoid the need for public funding. There were problems from poorly structured concessions. No sustainable financing model has emerged – most projects have not achieved the financial returns their financiers forecast, and the financing models are thus for the most part not replicable. And in the post-Asian economic crisis and post 9-11 years, the outlook for private financing has changed markedly for the worse.

Thus the past approach is not seen as, and is not sustainable. Faced with this experience some governments (particularly the more affluent) appear to be questioning the private financing of infrastructure. Future policy is therefore to some extent at the cross-roads. Does the concession model – modified in the light of experience - have a future, or should governments revert to a public sector model for infrastructure development?

We have analysed the causes of existing problems, and asked whether these are intrinsic to private concessions. We conclude that they are not, but that reliance on private finance can result in disappointment if expectations are unrealistic or if the concessioning regime is not structured correctly. Recently much has been learned in Asia and advances in private concessioning have taken place elsewhere. Together these experiences open up new possibilities for the future. The strategic choice facing governments is whether to build on this experience in procuring private concessions, or to turn back to public procurement, and risk losing the progress achieved. This report concludes that private procurement should in the right circumstances be deployed by governments to pursue public policy objectives. We now turn to how this should be done.

ES.2

Future Policy

There are two major areas where change is necessary. The first concerns government's necessary role - in particular in carrying out the planning and coordination functions. The second concerns concession design, where much has been learned and new modalities offer promise.

Government's Necessary Role

Government's focus needs to be on creating a sustainable MRT business, rather than on implementing an infrastructure project. Then, wider community benefits follow. The concessions have demonstrated the private sector's impressive entrepreneurship in developing deliverable MRT projects; but also the limitations to private sector participation. There are many tasks that the private sector cannot

alone do or is not motivated to do – these require government action that has often been absent.

Planning and coordination. The *essential functions* that government must carry out are described in this report. Action here offers the prospect of substantially improving MRT success. Government needs to develop ‘hard-nosed’ transport plans that are as whole affordable and resolve key conflicts – and therefore provide a basis for decision-making (many existing plans fail on both counts). Transport policy should strive to provide a ‘level playing field’ for all transport modes, through its tax/subsidy and regulatory measures; when this falls down MRT benefits suffer and government funding support is higher than it need or should be. This happens when cars or buses are subsidised, or when competition is not regulated. Thus MRT success requires a holistic approach to transport planning. Government needs to integrate the MRT into the transport system (without this the MRT has been described as ‘a tree without the branches and leaves it needs to grow’). Most people need to access the MRT by another mode, integration is therefore necessary and experience shows this requires government action.

Affordability and financing are always at the heart of MRT planning and development. Because MRT projects are costly, and their revenues rarely cover all their costs, there is a funding gap that the public sector must meet – it is usually a large gap, measured in hundreds of millions of US\$. The rationale for this is to secure the large benefits MRT projects can produce for road users who do not pay. This it can do by providing finance up-front or it can defer the ‘pain’ by procuring a private concession that provides the necessary financing, to be repaid later at a cost (the rate of return). We conclude that the financing efficiencies of the privately financed concessions have outweighed the additional cost of private finance.

Project development process - MRT system development poses a massive challenge, and may be carried out more or less efficiently. The main lessons of experience are that government needs to:

- Define a *process* early, comprising the sequence of tasks and decisions to take a project from concept to successful operations efficiently (only rarely is such a process developed)
- Carry out substantive, *front-end feasibility work* to identify a deliverable project (this is a characteristic of the comparator cities, and was absent from most case study projects). The involvement of private sector parties can assist in this. Influence is great at this early stage
- Develop an MRT *performance specification*, with private suppliers competing to provide a system that is fit-for-purpose (avoiding a focus on technology that is usually not appropriate)
- Develop *forecasts* of MRT viability that are reality-checked by government against the performance of comparable operating MRT systems (thereby avoiding ‘optimism bias’ that is pervasive in this sector)

- During planning and implementation keep focus on the *operating railway*. Decisions taken during these periods will largely commit the MRT's operating success; and when the sole focus is on 'completing a project to time and budget' this success is undermined.
- Create a *sustainable MRT business* – by providing the legal/ other framework for establishing a sustainable operator. This requires clear objectives for the business, a sustainable basis for its financing, and management autonomy. Thereafter government needs to avoid actions that undermine the possibility of management effectiveness.

Ownership, control and regulation – some question whether government ownership of MRT assets is necessary to resolve perceived MRT problems – or whether this can be achieved by private concessions. There is no simple paradigm for ownership and control of MRT's. Ownership is not necessary for control and it comes at a price in reducing the availability/ benefits of private financing and ownership. The more important private financing is the more attractive the private ownership/ concession route. The less certain the city is of what it wants the more attractive the flexibility of public ownership. The key is for the city to establish clear objectives and plans and then devise a regime that suits these and its own financial and institutional resources: there are plenty of examples of joint public private schemes to choose between. Making these choices requires great care as the consequences of the wrong choice can be costly and long lasting

Development of a large network – some governments have come to recognise that they now need to integrate their existing projects (one with the other, and all with buses) and extend them. They ask whether it is possible to do this efficiently with private concessions. It is of course early days (the first MRT concession opened only 12 years ago in Manchester UK) but there are a few examples of cities already doing this. They have faced problems concerning the incorporation of extensions, and the management of multiple concessions with different contractual timings, but some solutions have been and are being found. The alternative approach has also encountered problems when establishing an efficient public procurement agency. The evidence is that both private and public sector routes are demanding both face problems and both can provide answers.

Buy-back of existing concessions. This is argued by some on grounds of achieving control (removing contractual barriers to change), clarifying responsibilities and removing any modal bias, making it more likely that government will implement integration. But there may be substantial draw-backs too: losing the benefits of private concessioning described herein, losing the MRT operator management experience and incurring a large financial cost that would otherwise not be necessary. These issues require to be weighed carefully in the light of local circumstances and competences, in the knowledge of what is possible.

Concession Design

Government's business case should provide the basis for concession design, by identifying and quantifying where possible project financial and other outcomes and risks. Governments often attempt to transfer almost all risk to concessionaires without recognising the impact of this on costs; this will often not be in the public interest. The determination of risk allocation requires contact with potential bidders in order to establish their appetite for risk – something that may change quite quickly in the light of macroeconomic, country or sector events.

Risk allocation is a motivating determinant of behaviour. If government shares risk, it will strive with the concessionaire to make the project successful; but if it does not it may avoid such actions that are seen to reward the concessionaire. So risk management should be used proactively to engender action in the public interest. Risk should then be allocated to the party best able to manage it, having regard to their ability to carry risk (this depends upon their revenue raising powers and local politics). There is a body of risk neither party is able to manage that depends upon future events that may be unforeseeable. Here the parties should commit to work together to develop an acceptable solution, requiring a *public private partnership*, rather than a confrontational contractually-based relationship.

Concession options – Asia's experience has been primarily that of BOT concessions. We now know that these are not viable in the MRT sector; and even when applied to equipment and operations, the BOT model may be questioned. There are however a number of concession forms with promise that may have application:

- 'Reverse-tender' BOT - a development of existing practice, except that bids are evaluated on the basis of the lowest public sector subsidy required
- A BLT concession to implement the infrastructure, followed by an operating concession (a development of the Manila MRT3 example).
- A PFI concession – the subject of much application and some success in the UK. These concessions involve significant risk transfer to the private sector, specification of output requirements, long-term responsibility for maintenance with the private sector, and – critically, payments linked to performance and availability.

Concession terms – These should focus upon the requirements of the selected concession form. Attention should be given to defining the output requirements and availability/ performance requirements that will deliver effective service; these parameters can then be regulated and may form part of the payment to the concessionaire. The following issues are important:

- *Commercial risk* is often the core issue –The full transfer of this risk to the private sector is now unlikely to be acceptable or desirable, and several options exist for sharing risk. This can contribute in an important way to securing government action to maximise the project's success

- Asia's experience has shown that *macro-economic risk* can be large. It is necessary that government carries much of this (foreign exchange/ devaluation, inflation, taxation).
- MRT projects need to be part of the transport system. *Integration* requires both government action and government specification of actions required by the concessionaire. JBIC have raised the issue of *technical integration* that is addressed herein.
- Concession agreements need to specify provisions for *system extensions*.
- Asia's experience has demonstrated the wisdom of *firm but pragmatic administration of long-term concession contracts* – when things go wrong (for experience shows that they usually do).

Financing Arrangements – this experience has demonstrated the wisdom of defining clear principles to govern financing, usually leading to a conservative debt: equity structure, a focus on domestic debt (to reduce foreign exchange risk) and recognition of the advantages of some foreign bank involvement. Development banks such as the World Bank, ADB and JBIC may become involved. They provide long-dated loans at attractive interest rates and may provide guarantees. However to date concessions have usually developed rapidly/ unpredictably, and this has militated against accessing their finance or guarantees as they require a formalised process with due diligence and due process to be confirmed. But when achieved they provide confidence for other investors.

ES.3

Problems to be Avoided

We were asked to list 'problems to be avoided'. The following are put forward on the basis of our experience:

1. Don't assume that what worked yesterday will work tomorrow. Much has been learned about MRT concessions worldwide, and the global outlook has changed. Attitudes of investors and lenders have changed markedly. The approach to MRT concessioning needs to change too.
2. Don't simply say 'yes' to a private sector proposal. Government should always determine its minimum requirements (part of its planning function)
3. Don't focus primarily on delivering a construction project. Instead focus on operations – developing a sustainable MRT business, and therefore a sustainable operator. Operational input should be influential throughout the project's development.
4. Don't assume that MRT projects should be financially viable. They are different from most infrastructure, they produce major benefits for people who do not pay. They will likely require large public funding.
5. Don't 'sleep walk' into believing forecasts. Always reality check forecasts (of costs, ridership and revenues) against the known experience of comparable operating railways.

6. Don't confuse funding (who pays) and financing (financial engineering). MRT projects almost always have a large funding gap – and only government can fill this. Financial engineering can contribute by improving efficiency, but mostly this it is a way of deferring public spending to the future at a cost.
7. Don't commit to the MRT route, its vertical alignment, its technology or the form/terms of a concession early. These decisions should follow substantive study by government. The concession terms should include a performance regime targeting service aspects such as reliability that are important to passengers.
8. Don't assume that an available right-of-way will make a good MRT route. There needs to be an existing high demand and congested corridor with prospects for continued growth.
9. Don't assume a depot site will be available. This requires a large land area that is often difficult to secure. It will often dictate the route, and without it there can be no MRT.
10. Don't assume that government control of MRT development requires ownership, it does not. There are pros and cons of ownership and this balance may change over time.
11. Don't assume that the development of a large network requires public ownership. Both private and public procurement options face problems, and both can achieve this.
12. Don't assume that private concessioning is always the right answer. Its success will depend upon success in structuring the concession regime correctly.
13. Don't assume that risk transfer to the private sector is necessarily a good thing. If the wrong risks are transferred, the project cost will escalate and it may not be value-for-money. Risks should be allocated to those who can bear them and are best able to manage them.
14. Don't assume that a BOT, equipment BOT or BLT concession form is necessarily appropriate. There are other concession forms that may be better, as described herein.
15. Don't delay when a project can be rationally justified – timing is very important in developing cities.

ES.4

Best Practices to Pursue

1. MRT should always be viewed in terms of its overall impacts – on efficiency, city development, the environment (micro and macro) and energy savings, and the cost to the exchequer. MRT success (implemented by concession or otherwise) requires government action to integrate the MRT into the city on a level-playing field with car, buses and other rail projects.

2. The identification of rail projects needs a strategic transport framework, produced by a plan that is realistic – i.e. is affordable, implementable and resolves conflicts. Few plans satisfy these requirements.
3. Rail-based MRT projects should be justified within a framework of public affordability and the range of technical solutions available – including road and rail-based MRT's.
4. MRT projects require a strong, committed government sponsor who will last course.
5. Government needs to confront 4 questions early: what can the public sector afford? What fares should be charged (this will depend on the role of the MRT and the affordability of passengers)? What role for the private sector in financing and implementation? What role for the private sector in operations?
6. Recognise the essential functions that government must perform (set out in the report) – in particular in planning and coordination.
7. Determine how best to control MRT development, whether by ownership or control, by balancing the pros and cons as set out herein.
8. Talk to potential investors to understand their interests, motivations, attitudes to taking risk – in order to structure the concession and secure effective competition.
9. Allocate risks between government and the private sector realistically, and to incentivise both parties to work together to common ends.
10. Actively support project implementation and operations through government's actions, with the objective of making the project successful, so that the city residents benefit.
11. Government or the concessionaire to establish by statute or contract a semi-autonomous operator who is incentivised to perform within a framework of government policy.

PART A THE CASE STUDY EXPERIENCE

1 Introduction

1.1 *The Report*

This report is a background paper to the flagship study on infrastructure services provision in East Asia and the Pacific. It is required to review the experiences and issues revealed by urban rail concessions in Bangkok, Kuala Lumpur and Manila, and by drawing on experiences in three comparator cities – London, Hong Kong and Singapore and more widely, to draw lessons of wider relevance in the Region. These are in particular expected to contribute to the flagship study urbanisation and public-private themes.

The report is the result of previous working knowledge of the relevant cities and their transport problems supplemented by visits to Bangkok, KL, HK and Manila, and by a wider knowledge of the urban transport and MRT sector.

1.2 *Our Approach*

Our approach is rooted in the reality of developing cities, whose leaders are struggling in the face of many problems to bring some order and management to their cities. We know how rail systems have developed in what are now regarded as successful developed cities; rarely has such development followed a rational planning paradigm². Often projects were developed when opportunity arose, changes were then made, new projects added and over time MRT *systems* have developed, warts and all. London Docklands is a current example of this development path.

We have found a deep and widespread support for MRT development, and an urgency to implement systems. Politicians recognise the urgency of action, and their question is how best to proceed. Concessions have been supported as an obvious strategy, for MRT projects were expected to avoid the need for public funding – substantially or completely – while delivering major benefits. The skills and resources of the private sector were expected to bring about a transformation in their cities, at little or no public cost. We now know that things have not worked

² This would proceed with the development of a sound plan, and be followed by its phased implementation and periodic updating

out like this, and that MRT should confront decision-makers with difficult choices, and then require them to provide effective support.

Our starting point has been to assess existing experience, by answering the following questions:

1. Has a beneficial private concession MRT project been implemented?³
2. What would have happened if the private concession had not gone ahead – would the project have been funded/ implemented by government?
3. Is there evidence that one procurement approach (public or private concession) is better than the other?
4. What scale of private financing and funding has been achieved?
5. Has private financing achieved its expected return – and therefore does it provide a sustainable model?

The focus of the paper is the future, and we know after the Asian economic crisis and 9-11 that this will need to be very different from the past. On the one hand the prospects for private financing are much more challenging – not least because of the experience in this and related sectors; and on the other much has been learned that allows us to be more effective in designing concessions in the public interest. The second part of this paper draws together the lessons learned, and draws conclusions as to how they may best be applied.

Before doing this we briefly summarise the rationale for MRT systems, since this underpins the subject matter. In particular governments' disappointment with MRT projects has to some extent resulted from their unrealistic expectations. It is important to start by understanding what MRT projects can do, and how this is affected by government support.

1.3

Rationale for MRT Systems

Urban rail systems can impact upon large cities in many ways. They often allow a large city to function effectively even when congestion is severe. The additional capacity they provide may allow the dynamic centre to continue to thrive, something that would otherwise not be possible. Over time they can fundamentally change the structure of a city. Alone they mitigate congestion (which is less severe than would otherwise be the case), but they may open up a demand management policy agenda that *significantly* reduces congestion and its attendant pollution.

The rationale for MRT systems is therefore inextricably linked to the future development of the city and its transport system. Because MRT systems are costly, the conditions for their justification are demanding. Two reports set these

³ If a post-evaluation was carried out, would it be justified in terms of government's overall objectives?

requirements out.⁴ Economic justification is particularly important, and this requires a combination of the following conditions to exist: high levels of existing public transport corridor demand, incomes that are not low and are expected to increase (benefits are closely linked to incomes), a low-cost alignment, fares that avoid the need for ongoing large subsidies, and a stable institutional framework.

The 1990 report described the results of research in 21 developing cities worldwide. The major reasons for supporting MRT development then were ‘to improve the quality/ quantity of public transport’ and ‘to relieve traffic congestion’ followed by ‘to be financially viable’. Set against these expectations it was found that MRT did indeed improve public transport - but that MRT needed to be integrated with the buses in most cases; that traffic congestion was mitigated but by no means solved – this required at least complementary private vehicle demand management policies; and that there was little evidence that MRT projects (all public sector at that time) were financially viable⁵. The results of this 2004 study in many ways mirror those of 1990. Here too governments often expected (or hoped that) traffic congestion would be materially reduced, that the public transport system would be widely improved and that this would be achieved at little or no public cost. To some extent this is explained by their expectations of private sector concessioning (that did not exist in 1990). That it has not delivered these outcomes is now undisputable. The MRT realities of 1990 are seen to have substantially stood the test of time, albeit that concessioning is shown in this report to be a promising procurement mechanism in many cases.

1.4

Structure of the Report

Section 2 summarises key aspects of the concession projects in the three cities and this is followed in section 3 by an assessment of them focused upon the five questions set out above. We then in section 4 summarise the relevant experiences of the comparator cities that are recognised to have achieved some degree of success in this sector.

Part B of the report focuses upon best practices, derived from this experience. Section 5 sets the context of a future different in many ways from the past. Section 6 describes best practices in seven key areas.

Part C provides background information in six Annexes. Annex A provides detailed data about the concessions projects, and Annex B analyses their development and summarises key features of this. Annex C summarises key issues in the case study and comparator cities. Annex D summarises the record of

⁴ Halcrow (2000) ‘World Bank Urban Transport Strategy – Mass Rapid Transit in Developing Countries’, DfID/ The World Bank, July 2000

Halcrow Fox (1990) ‘Study of Mass Rapid Transit in Developing Countries’, Contractor Report 188 for TRRL/ UK ODA

⁵ Defined as their fares and other income funding their capital, operating and asset replacement costs. Only the Hong Kong MTR was close to viability, with the assistance of substantial property development gain/ income

forecasting success against project outturns for MRT projects, worldwide and in the case study cities. Annex E describes the stakeholder attitudes and motivations established in the study. Annex F shows the MRT networks in the three cities.

2 The Concession Projects

2.1

Introduction

Bangkok has 2 MRT projects, Kuala Lumpur 3 and Manila 3. Two of the Manila projects have been publicly procured, and the remaining 6 projects are private concessions; these form the focus of this report. Bangkok and KL additionally have effective suburban rail services.

All governments have developed their systems at the time of the Asian economic crisis, and they have learned much about the nature of MRT systems and their finances. Today the Thai Government has committed to a huge, rapid extension of the existing MRT system. In KL which has a large rail system for its size, the focus is on restructuring to put the existing system on a sustainable basis, and then extending it. In Manila there are many projects seeking Government approval, to build on its existing 3-line MRT system.

There are different attitudes to attracting private finance in the cities. In Manila, perhaps the least conducive environment, this is considered essential. In Bangkok past experience with its 2 lines have tempered expectations; increasingly government is turning to government financing of infrastructure and letting private concessions for operations. In KL the reality of government funding and intervention has become clear. Government proposes to establish an Urban Transport Authority, a public transport asset owning company, and an operating company to which it would be contracted.

2.2

The City Environments

The cities represent distinctly different environments for project development, with some similarities but differences too - **Table 2.1**. All are democracies, have dominant central governments, and face coordination difficulties within government and with city governments. All have extensive PSP experience and strongly promote PSP. None has fully effective transport strategies. In some respects however they differ: KL in particular has strong, purposeful leadership providing policy continuity, while Manila varies in its leadership/ policy effectiveness, and Bangkok is somewhere in between. KL and Bangkok have deep local bank/ capital markets while Manila's is still developing.

2.3

The Concession Projects

Table 2.2 provides summary information for the 6 urban rail concessions, and **Annex A** provides more detail. These are sourced from a combination of authoritative references, meetings with a wide range of stakeholders and (to a limited extent) press reports. Where possible information has been corroborated. This database is considered to provide a reliable basis of information for this study.

The projects are seen to encompass a wide range of MRT possibilities, varying:

- In function between city centre people-mover to full (HK-MTR like) metro
- In extent between 9 and 29 route kms.
- In technology from monorail to first world metro, including automated transit and LRT streetcars
- In cost between US\$ 0.3bn and US\$3.1 bn; of which the concession part ranges US\$0.3bn and US\$1.5bn
- In concession form from full BOT (no public funding) to BLT (private financing wholly repaid by government under a lease), including equipment BOT (the private sector funding 20% of the total cost)
- The debt-equity ratio varies between 2.0 and 4.2 to 1
- Foreign debt finance varies between 0 and 56% of the total cost
- Year 1 ridership varies between 45,000 and 170,000 passengers/day, and 2004 ridership (also year 1 in some cases) between 45,000 and 375,000/passengers/day

The concessionaire companies have generally been domestic companies, conglomerates with an interest in infrastructure construction and property development, or contractors or property developers.

TABLE 2.1 PROJECT DEVELOPMENT ENVIRONMENTS

CHARACTERISTIC	BANGKOK	KUALA LUMPUR	MANILA
Politics/ Leadership/ Style	Democracy, politicised leadership, increasing policy stability. Increasingly proactive/ effective.	Democracy, strong continuity in leadership and policy, effective. Purposeful style, strategic thinking, ‘can-do’ attitude	Personality-led democracy, variable policy effectiveness Bureaucratic, sometimes reactive style
Role of Gov’t and Private sector	Historically substantial reliance on PSP and the private sector	Prime Minister has had a major influence on overall strategy. Heavy reliance on private sector for project dev’t/ imp’n	Government strongly supports PSP, reacts to approaches from the private sector
Structure and Coordination of Government	National government dominates, coordination is problematic, most decisions by Cabinet. However BMA instigated the BTS concession	National government has dominated coordination sometimes problematic. Proposal for a KL Urban Transport Authority under PM Dep’t	National government dominates, coordination is problematic. Metro Manila Dev’t Authority is embryonic
Experience of Infrastructure PSP	Extensive, early leader – power, expressways, water etc	Extensive – early leader. Power, expressways etc	Extensive – power, expressways, water etc
Transport Strategy	Strategies are developed, not always implemented/ effective	There is a holistic strategy for national dev’t. + an urban transport strategy. Not fully effective	Strategies are developed, not always implemented/ effective. What happens influenced by people/ events
Resources	Bangkok transport has a high political profile – public sector affordability is increasing. Deep local capital markets + an entrepreneurial/ effective workforce	KL transport has a high political profile - public sector affordability is increasing. Deep local capital markets + an increasingly entrepreneurial workforce skilled in PSP	Low public sector affordability. The major private players are the ‘families’/ oligopolies Limited local capital markets
Physical characteristics	Low-lying with high water table, difficult tunnelling	Hills and valleys, difficult tunnelling	Mostly flat, country subject to periodic natural disasters

TABLE 2.2 THE CONCESSION PROJECTS

	BANGKOK		KUALA LUMPUR			MANILA MRT3
	BTS ('Skytrain')	Blue Line	STAR	PUTRA	Monorail	
Sponsor	BMA - Metropolitan gov't	MRT Authority – Central gov't	EPU, under P.M.'s Department – central gov't		Dept of Railways - central gov't	DOTC – central gov't
Concessionaire - major shareholder	BTSC Tanayong (Thai property co)	BMCL CH Karnchang (Thai infra contractor)	STAR Gov't, Taylor Woodrow/ Adtranz	PUTRA Renong (Malaysian conglomerate)	KLMS KLIK (KLMS a subsidiary)	ELC 4 Filipino property developers
MRT Function	Full metro	Full metro	LRT	Metro	People-mover	Metro
Alignment	2 linked routes thro' CBD, elevated. 23.5kms	1 underground radial/ distributor route. 20kms	3 radial routes, elevated/ at-grade 27kms	2 elevated radial routes linked under CBD. 29kms	1 elevated line, linking rail systems and major dev'ts. 9kms	1 line mainly elevated/ at-grade, down Manila's premier highway. 17kms
Technology	First world metro	First world metro	Standard no-frills high-platform LRT	Fully automated, driverless system (world's longest)	Malaysian built monorail, based on Seattle ALWEG	Czech streetcars operating metro service
Concession	Civil works BTO + Equipment/ ops BOT	Equipment/ ops BOT Civil works JBIC ODA loan	BOO (review after 60 yrs)	BOT 30+ 30yrs	BOT 40+30yrs	BLT for 25yrs in return for guaranteed revenue stream + property upside
Cost US\$bn	1.4	3.1 (of which concession 0.6)	0.9	1.5	0.3	0.7
Financing						
• Govt	0%	80% (land/civil works)	0%		0%	0% (Gov't repays 100% under the lease)
• Equity	33%	6%	20%		22%	28%
• Foreign debt	45%	5%	0%		0%	56%
• Domestic debt	22%	9%	80% (incl. govt support loan)		78% (all gov't supported)	16%
Ridership '000s pass/ave.day						
• Year 1	160 (in 2000)	Year 1 is 2004-5	65 (1999)	(1999)	Year 1 is 2003-4	170 (2000)
• 2004	350	(120)	110	150	45 (red. frequency)	375
Farebox ratio Revenue/ opcosts	2.1	Too early	Combined 1.3		>1	

2.4

Development of the Projects

None of the projects has been developed according to the rational planning paradigm described earlier. Instead each has a chequered history. We briefly describe this to explain the real world of project development as practised to date; and **Annex B** describes it and its results in more detail.

We see (from **Table 2.3**) that the projects have taken between 5 and 12 years to develop from their concept to operations. Two recent public sector procured projects are shown taking 10-13 years by comparison. All such projects face opportunities and problems, and the key events influencing the project development period are summarised.

**TABLE 2.3
CONCESSIONS PROJECTS - PROJECT DEVELOPMENT PERIOD**

Project	Development from Concept to Operations	Years	Events affecting Dev't Period
CONCESSION PROJECTS			
Bangkok			
• BTS	1990-1999	9	Depot problem, project changed
• Blue Line	1992-2004	12	Asian economic crisis Asian economic crisis Interface between civil works + concession
Kuala Lumpur			
• STAR	1990-1998	8	Commonwealth Games
• PUTRA	1994-1999	5	Commonwealth Games
• Monorail	1994-2003	9	Asian economic crisis
Manila			
• MRT3	1990-2000	10	Gov't processing the concession (pre-BOT Law)
PUBLIC SECTOR PROJECTS			
Manila MRT2	1991 – 2004	13	Securing ODA finance Implementation problems
Singapore NEL	1986 (1993) – 2003	17 (10)	Gov't decision to defer for 7 yrs Complex project

The MRT concessions have been developed rapidly by international norms. This is a singular achievement, although its cause does not necessarily translate into successful operations. It appears to result from a combination of:

1. Private sector leadership, with a clear focus on implementability and financability. The potential for delay has been avoided during project identification. Planning was generally confined to what was necessary to

implement the project. The public sector has generally had a minor role in these projects

2. An early decision on concession form. This secured early private sector commitment
3. Working effectively within formal processes. Where they have existed they have not been subverted; but there is some evidence of a culture of secrecy surrounding concessions and their terms. High-level connections have been required to expedite decisions, effect realism in contract terms and break bureaucratic blockages.
4. Minimising competition for the concession – by means of unsolicited bids (part of the formal process) and direct negotiations. This provided a strong incentive and predictability in timing.

Bangkok

Context - Bangkok is a rapidly developing megacity of close to 10 million people. By 1990 it was renowned for its chronic traffic congestion. There had been strenuous efforts for many years to develop an MRT project, but repeated setbacks. Against this backdrop and worsening transport problems the BTS opportunity was recognised by then BMA Governor Maj. Gen Chamlong. At that time there was a technocratic government and it was determined to restore economic credibility to Thailand after unrest. It terminated the Lavalin concession, identified the Blue Line, created the Mass Rapid Transit Authority of Thailand, and on its last night in office approved BTS.

BTS Concession - At that time there was no formal project development process. It was enough that a government agency found a concessionaire and contracted a concession with him. No feasibility study was necessary. BTS was originally to be a Central Area people mover with a capacity of just 10,000 pass/hr/direction, with its technology undefined. It was developed at a time of some frustration that central government had failed to deliver on promised BOT MRT projects. In three respects it was to be a straightforward project: there was one government sponsor – Bangkok Metropolitan Administration (BMA), it was only to use land owned by the BMA, and no public finance was available. It was to fit into a full metro network comprising other than committed concessions - Skytrain (on what became the Blue Line alignment) and Hopewell. The project was to serve the main corridors of commerce in the Central area - Silom and Sukhumvit. However as the project developed the concept changed completely to a full-scale metro, serving the same corridors, but needing to extend outwards substantially to the north to locate a depot site.

Blue Line Concession- The project was developed to take advantage of a window of opportunity provided by the technocratic Anand Government.

Unusually an MRT expert (Professor Ridley⁶) was contracted to identify the project within a 3-month period. This proved possible because Government owned a large land holding that could be used for the depot. This, together with the ‘committed’ Hopewell concession effectively committed the Blue Line to its existing corridor. Government’s subsequent 1995 decision to underground all MRT development in central Bangkok had a major impact on the project (it alone of all projects was affected). The Blue Line is the first underground metro in Thailand.

Kuala Lumpur

Context - Malaysia has had a strong government led by a visionary Prime Minister intent on transforming Malaysia in 30 years to a developed society (Vision 2020). It has put faith in the private sector to lead this change, and has sought to use infrastructure development to achieve the following objectives:

- Drive forward and integrate the Malaysian economy
- Champion and market Malaysia internationally as a high-tech society
- Create ‘champion’ bumiputra entrepreneurs, with the objective of reducing the economic disparity that Malays had traditionally encountered
- Access private finance to be the engine of change. Government awarded long concessions, with no intention of becoming involved in operations
- Develop a ‘green’, liveable City Region for the fast-growing capital city.

This ambitious agenda has to be seen against a backcloth of: sustained high-growth and considerable success in developing expressways infrastructure (in particular). Malaysia therefore had the conglomerates, developed local capital markets, and many skilled technocrats able and willing to respond to the challenge. The expressways success led to confidence that MRT concession projects could also be successful.

KL had the usual transport studies that had recommended balanced policies. But little happened other than highway development. Public transport was by the end of the 1980’s mainly performed by unpopular minibuses. The origins of change were the foreign (Taylor Woodrow/ Adtranz) BOT proposal for the STAR project. Government approved this and at this time the creative thinking for KL and its region took place. The decision was taken to extend the success of highways privatisation to new areas – KTM (State railway) and urban public transport in particular. The result was the addition of PUTRA, and the KLIA (new international Airport) axis concept catalysed by expressways and the Express Rail Link. The Commonwealth Games precipitated the need for STAR to be extended and the timing of PUTRA – for KL was to be Malaysia’s showcase to the world.

⁶ now Professor Emeritus at Imperial College London, formerly Managing Director of the Hong Kong MTRC, London Underground and UK Tyne and Wear Metro

The Monorail proposal developed as the spine to a 12km 'linear city' that was developed in the heady property days of the early/ mid 1990's.

STAR Concession STAR was the result of an unsolicited proposal from Taylor Woodrow/ AEG (later Adtranz) to develop KL's first LRT project. The focus was on minimising the first cost, since this was considered essential to get approval. The alignment (a former disused rail right-of-way to an industrial plant) is a circuitous mostly at-grade radial to the city centre, and the technology a no-frills LRT. The 1998 Commonwealth Games precipitated Government's request to build a second southern line serving the Games stadium. A short northern extension was agreed to compensate for the expected poor traffic on this new southern line.

PUTRA Concession - is a major component of KL's MRT strategy, comprising two radial lines, linked through and under the city centre. PUTRA followed STAR at a time when Government had decided to implement an LRT system, and following broad transport planning studies, but no feasibility work. Renong Bhd. was asked to develop the project - a major Malaysian conglomerate. They were asked by the Government to start work before signing a concession to meet the Commonwealth Games deadline. Following bidding for a supply contract, a contract was signed with Bombardier for a fully-automated driverless transit system (said to be the world's longest) capable of operating at close (90-second) intervals. This was considered the right high-tech image, albeit it was said to be the highest cost bid on a first-cost basis.

Monorail Concession – this was conceptualised in the 1980's. Its original objectives were to link 90% of the hotels and shopping centres in the Central Area, act as a distributor between the other transit systems (STAR, PUTRA, and KTM) and form the spine ('horizontal elevator') of a proposed 12-km 'linear city' following the river developed at the height of the mid 1990's property boom. The original project was for a 16 km elevated Hitachi monorail system. The project was necessarily revised following the Asian economic crisis, and changed substantially: the linear city concept was dropped the route was shortened from 16 kms. to 8.6 kms, the decision was taken to develop Malaysian-manufactured technology modelled on the Seattle Trade Fair ALWEG monorail, and government agreed that all debt financing was to be public sector.

Manila

Context - Manila is a rapidly expanding megacity with a population of approximately 11 million. Car ownership and congestion are high, and most Filipinos use public transport. This has for years been manifest in large (20,000 pass/hr/direction) flows of bus/ jeepney passengers down the major corridors. In 1984 Manila's first fully elevated LRT system opened and was an immediate success. Since then ambitions for network development have been sustained, but not been matched by the state of the public finances.

Following the Marcos regime in the early 1980's democracy flourished. The 1990's saw a strong government under President Ramos, promoting an open policy, deregulation of markets, re-engineering the government bureaucracy and strong support to PSP in infrastructure; and a BOT Law was enacted. Then came the Asian economic crisis in 1997, and some loss of policy focus that perpetuates. This environment has not been conducive to effective project development. Latterly there have been challenges to BOT signed contracts and confidence within the private sector has been low. There is today a prospective economic crisis that government is addressing, and that will constrain public sector affordability.

About 1989 Government decided to bundle the Line 1 operations with a new Line 2, and to bid out this package as a BOT contract. The bidding failed, and after a delay, it was decided to implement Line 2 as a stand-alone line, with GOJ ODA finance, advantage being taken of the Obuchi Fund. Construction started about 1998, and the line was fully opened in October 2004.

With the advent of government's major BOT policy thrust in the early 1990's, and privatisation of the former US forces bases at Clark and Fort Bonifacio, came a wave of private sector projects – Northrail, Southrail, MCX, PNR na Riles, Line 4 and more. Today many projects are still current, and there are new proposals as well. There has been strong support for MRT development, with few opponents, throughout the last 15 years.

MRT3 Concession - MRT3 was to be an early demonstration project of Government's BOT policy effectiveness. The project concept was by a project developer who had recognised the success of BOT in the power sector and recognised the potential of this model, providing the cost could be kept within acceptable bounds. The project is a fully segregated MRT mostly at-grade/ elevated, using Eastern European streetcar technology, in the median of Manila's main thoroughfare. The need was obvious, having been identified in earlier studies and Government owned the entire right-of-way. MRT3 is a Build-Lease-Transfer (BLT) concession. The concessionaire MRTC finances, constructs and maintains the project for 25 years and implements commercial developments for 50 years, in return for which it receives a fixed revenue stream and annual rental payments (for property). In effect he takes construction (cost/ delay) and maintenance risk in return for a guaranteed return with property upside. Operations are by Government, who take the commercial risk and a share in the property upside.

3 Assessment of the Concession Projects

3.1

Basis of Assessment

The assessment seeks to answer five questions:

1. Has a beneficial private concession MRT project been implemented?⁷
2. What would have happened if the private concession had not gone ahead – would the government have developed the project?
3. Is there evidence that one procurement approach - public or private concession - is better than the other?
4. What scale of private financing and funding has been achieved?
5. Has private financing achieved its expected return (does it provide a sustainable financing model)?

We assess the success of the projects from three points of view: that of users of the system and other city dwellers (how many people use/ benefit from the project?); government (how effectively do the projects contribute to government's overall objectives?); and financiers (to what extent do project financial returns match expectations?)

We have noted above that some governments had unrealistic expectations of MRT projects. The reality of MRT in developing cities was established by Halcrow Fox (1990) *op cit...*

3.2

Has a Beneficial Private Concession MRT Project been Implemented?

None of the concession projects has to the best of our knowledge been post-evaluated; hence the answer to this question “would the projects be justified in overall socio-economic terms?” must remain moot. Nevertheless we would expect a successful project to satisfy the following conditions:

- It is appropriate to the needs of their cities, given government objectives
- It has a cost that is not high and is in line with international experience⁸.
- It operates well, and does not have problems of reliability or capacity

⁷ If a post-evaluation was carried out, would it be justified in terms of government's overall objectives?

- It has high ridership, since this is directly linked to most benefits.
- It has a positive developmental impact, both in the immediate vicinity of stations/ depot and on the city structure
- It provides a basis for a sustainable urban transport strategy. In other words it provides a major strategic option for the future

Table 3.1⁹ summarises the assessment. The main conclusions are as follows.

Bangkok – today total system ridership is about 500,000 passengers/day. **BTS** is from the users/ city residents and government’s viewpoint an excellent project. Its cost is modest (for a metro - close to the median of benchmarked systems); its ridership is high and growing rapidly – leading to short-term capacity problems. It has become the centre-piece of Bangkok’s future MRT strategy, and of the mega city’s future sustainable development; and government has borne no significant cost. The **Blue Line** is less good. Its cost is very high – close to the top of the benchmarked systems (government required its under-grounding for environmental reasons); it is too early to draw conclusions regarding ridership (currently about 120,000/day just after opening) although its route is less good than BTS. However it complements BTS and will form an important part of the future MRT strategy. Government has now decided to embark on the integration of the public transport system and the rapid expansion of the MRT network as the cornerstone to its future strategy.

Kuala Lumpur – today system ridership is about 300,000 passengers/ day or close to 400,000/day with the KTM commuter services. This is a large ridership for a relatively small car-oriented city. **STAR** has a cost close to the median of benchmarked systems; however its ridership is not high, mainly the result of poor alignments (in part a disused rail right-of-way). **PUTRA** is the key project at the heart of KL’s future strategy, extending between two radials through and under the Centre. Its cost is close to the median of the benchmarked systems (even though it is fully automated), and its ridership results in short-term capacity problems, although it is modest in total. **Monorail** is as expected low cost, and already has a modest ridership. It is likely to fulfil its role as an effective distributor between the other systems and with major Central Area attractors. Government has now determined to create an Urban Transport Authority for the KL Region, to integrate all public transport, and then to proceed with selected network

⁹ There is mixed evidence of MRT impacts on poverty alleviation. Halcrow (2000) concluded that metros may benefit the poor by contributing to city efficiency and reducing congestion, pollution and accidents. But often MRT systems have high fares, and can have adverse consequences requiring the relocation of the homes and jobs of the poor, and enhanced land values near stations and depots that may force them to move elsewhere.

⁸ Based on empiric evidence – see Halcrow (2000) *op cit* Estimates by type of construction (at-grade/ elevated/ underground) are weighted by the MRT characteristics in Table 3.1 to produce benchmarks estimates against which actual figures can be compared

expansion. It is clear that PUTRA is a success from its users/ city residents and governments' viewpoints, and STAR and Monorail complement this.

KL's concessions were justified in part to project a high-tech vision of Malaysia abroad. This drove the timing of STAR and PUTRA; it was probably the rationale for the fully automated PUTRA and maybe Monorail too. In this objective the concessions have been successful. Successful high-tech concessions have been implemented, providing a springboard for Monorail to be actively promoted as an export industry, and PUTRA to manufacture its own cars. This experience appears to have accelerated government's appreciation of the complexities of public transport and urban transport sector management that result in its current far-reaching proposals for structural change.

Manila - today total system ridership is about 800,000 passengers/day (including LRT1 and the recently opened MRT2). **MRT3** is already a very good project .from the viewpoint of its users/ city residents and – in most respects – of its government; although its cost to government is higher than it expected. Its cost is modest for a metro – below the median of the benchmarked systems (it is in the centre of a major highway and excludes depot land costs); its ridership is already high – and suffers from short-term capacity problems. It allows the continuing densification of the catchment area of the major EDSA corridor. The public sector **MRT2** has just opened, and government plans to extend the overall MRT network as quickly as this can be financed.

TABLE 3.1 HAS A BENEFICIAL MRT PROJECT BEEN IMPLEMENTED?

	Bangkok		Kuala Lumpur			Manila
	BTS	Blue Line	STAR	PUTRA	Monorail	MRT3
Context	Congested, polluted, affluent megacity		Congested, polluted, affluent city			Congested, polluted middle income megacity
Concession	BOT	BOT on E&M eqp't only	BOO	BOT	BOT	BLT
Route	Excellent, elev'd through CBD	Radial/ distributor 100% under'gd	Circuitous radial	Radial through Centre	Distributor between systems	Excellent down major thoroughfare
Appropriate?	Fully	Yes if under-grounding justified	Doubts about alignment/ proc't strategy	Yes assuming automated transit justified	Yes appropriate to its distributor function	Yes to its route/ role, but capacity issues
Capital cost US\$mn/ km - benchmark	59 30-75	155 60-180	33 20-46	53 33-87	36 30-75	40 27-66
Operations	Excellent	(Excellent)	Good	Excellent	(Excellent)	Good
Ridership '000s/day - Year 1 - 2004 - 2004/ station	160 (2000) 350 15	Just open 120? (7)	65 (1999) 110 4	? (2000) 150 6	Just open: 45? (4)	170 (2000-01) 375 16
System congested?	Yes	(No)	No	Yes	(No)	Yes
Dev't Impact - stations/ depot - city structure	Yes – many dev'ts linked Yes – enables CBD to densify	No (underground) Too early to tell	No Not alone	Provision for major dev'ts – when market recovers Yes – enables CBD to densify	No Not alone	Provision for major dev'ts. Links to dev'ts beginning Yes – enables densification
City strategy	Core of sustainable strategy. Gov't to integrate/ expand	Complements BTS, a key part of the future network	Complements PUTRA	Core of sustainable strategy. Gov't to integrate the network	Complements PUTRA/ STAR, will benefit from integration	Core of the major transport axis
Environmental impact	Elevated, some 'canyon' effects. Attractive design	All underground	At-grade/ elevated. No major issues	Elevated/ underground. No major issues	Elevated, attractive design	At-grade/ elevated. Not attractive but in keeping with EDSA thoroughfare
Impact on Poverty	Premium fares	Premium fares	Premium fares	Premium fares	Premium fares	Premium fares. Squatter reloc'n followed process
CONCLUSION	Definitely successful	Too early to tell	Probably successful	Successful	Yes? - too early to tell	Definitely successful

TABLE 3.2 HOW DOES IT COMPARE WITH OTHER PROJECTS?

MRT System	City context	Scale of PT demand	% MRT underground	Ridership '000s/ station/day		Operations	Farebox ratio	Initial Cost US\$m/ km	
				Year 1	Years 3-4			Outturn	Benchmark
COMPARATORS									
Hong Kong MTR (MIS/TWE/Island)	7mn people in very dense city-state. High income	Very large	79%		44	Excellent	2.2 (incl. property)	131	Inputs to benchmark (below)
Singapore MRT Rec'd System	4.2mn people in city state with dense corridors	Large	37%	13	20	Excellent	>1	67	
Singapore NEL			100%	10	Na.	Excellent	<1 (early)	169	
Seoul Lines 1-4	10mn people in massive dense megacity	Large			16	Excellent	>1		
Pusan Line 1	4mn people in No 2 city with dense corridors	Large	79%	8	16	Excellent	1.0	32	
Manila LRT 1	10mn people, rapidly expanding megacity.	Large	0%	11	16	Good	Now 1.3	37	
Manila MRT2	Low/middle income		4%	7+	Na.	Good	Too early	57	
CASE STUDIES									
Bangkok BTS	9mn people in massive expanding megacity.	Moderate	0%	7	15	Excellent	>2	59	30-75
Bangkok Blue Line	Middle income		100%	(7)	na.	(Excellent)	Too early	155	60-180
KL STAR	1.4mn people in 'green' part-dev'd city. Middle/ upper income	Modest	0%	3	4	Good	>1	33	20-46
KL PUTRA			15%		6	Excellent	>1	53	33-87
KL Monorail			0%	(4)	na.	(Excellent)	>1	36	30-75
Manila MRT3			See above	Large	8%	7	16	Good	

Notes:

1. the comparators are successful Asian MRT systems
2. Their city context is current.
3. Costs for comparator projects are sourced from Halcrow Fox (1990) *op cit* + up-to-date sources for Singapore NEL, Manila MRT2

Comparison with Other Systems

Table 3.2 compares the performance of the concession projects with what are generally regarded as successful Asian public sector systems. When comparing the performance regard should be paid to the different city contexts, scales of PT demand and vertical alignment (shown in the table). Given this, what are the main conclusions?

1. All systems operate well from the passengers' viewpoint, and as well as comparable public sector operations.
2. These results provide confidence that the concession projects perform at least as well in initial cost terms as expectations based on public sector comparators¹⁰. At first sight this may be surprising. It is we believe explicable by the following:
 - The concession contracts were from the outset hugely demanding to achieve, and the downside of non-achievement was serious. They provided a spur to efficiency and little opportunity for excess profits
 - There was often strong competition for the civil works and supply contracts, achieved by the concessionaires
 - In Malaysia concessionaires who were awarded concessions were expected by the Prime Minister to deliver. There was enormous pressure to do this
 - The concession contracts were effective in protecting the public sector from the consequences of cost overruns
3. In ridership terms Bangkok BTS and Manila MRT3 are clearly very successful, on a par with comparable Asian public sector metros; and ridership on PUTRA is substantial. It is early days for Bangkok's Blue Line and KL's Monorail, and the story is more modest for STAR. However, the concessions could have been much more successful with a greater government input. Little attention was given to alignment/ station locations, to integration with the transport system, to interchange when lines crossed and sometimes to marketing.
4. Overall the socio-economic viability of the projects depends in part on future Government policy. Here the prospects in Bangkok and in particular KL are encouraging, with Government taking a firm hold of the management of public transport and the expansion of the MRT network.

¹⁰ This is despite reported higher financing costs in the private sector and the possibility of corruption in both sectors

3.3

Would the Public Sector have Developed the Project?

There is no provable answer to this question – of what would have happened without the concessions. However there is considerable doubt in most cases¹¹ that government would have implemented the projects. In part this is because governments typically have many priorities, and the energy and focus necessary to develop an MRT project is considerable. Using private sector organisations to finance, develop, implement and operate these projects has provided space for government to focus on its other priorities. In part it is because the private sector has shown considerable energy in identifying projects that government had not done (BTS, STAR, Monorail, and Manila MRT3 were all identified by the private sector). And in major part it is because the public finances would probably not have financed the cost of the projects, when faced with other priorities.

3.4

Would Public Sector Procurement have been more Effective?

In Manila MRT Line 2 was developed by government at the same time as the MRT3 concession. This provides some limited evidence of the comparable performance of the public and private sector procurement approaches. **Table 3.3** compares the evidence.

MRT Line 3 opened four years before MRT Line 2, despite their going ahead at about the same time. MRT3 ridership is already high while the early signs are that MRT2's is more modest. It has been argued that government developed the more complex MRT2 project after the private sector would not finance it – and that it is not fair to compare these projects on a like-for-like basis. There is some truth in this - certainly MRT2 has been more complex and the BOT bidding for it had failed. But this begs the question of why the two projects have been developed by their proponents. It does not appear that government decided on the basis of all the evidence to implement a more complex project. Rather government proceeded with a project that changed materially as it developed (due to problems with planning and decision-making), and its complexity then became apparent. Conversely the MRT3 project was identified by the private sector precisely because there was an obvious need, land was in government ownership, and - despite the construction challenge - the project was deliverable. Only then did implementation proceed.

The available evidence, limited though it is, is that the concession was the more effective procurement approach, albeit that the public reaction was critical of the concession while indifferent to the protracted delay for MRT2.

¹¹ Probably excepting the Bangkok Blue Line, where government had determined to implement its own project

TABLE 3.3 COMPARISON OF MANILA MRT2 AND MRT3 PROJECTS

PARAMETER	MRT2 Public Sector Procurement	MRT3 Private Sector Concession
Origins	Developed in the 1980's, based on reviving the old CBD	Relevant to modern linear city concept of affluent Metro Manila
	<ul style="list-style-type: none"> • Initiated after the success of LRT Line 1 • The BOT approach was tried and failed (early days, timing poor) • Much later ODA financing agreed by JBIC (including the Obuchi Fund) • Route materially changed during implementation, causing considerable cost escalation/ delay 	<ul style="list-style-type: none"> • A real need existed, the project had been identified at a strategic level • A private sector entrepreneur developed an affordable, financable BLT concession concept • Hard-headed realism drove the project through
Project	Conceived in 1976. Mainly elevated metro along often narrow radial corridor. Complex land issues.	Conceived in 1980's along Manila's major thoroughfare. BLT concept identified by a private developer
Procurement	Public sector model, ODA financed	BLT concession.
Implementation period	<p><i>1988 (initial feasibility studies)</i> <i>1989-90 BOT bidding fails</i></p> <ul style="list-style-type: none"> • 1991 Feasibility study with OECF financing in prospect • 1995 Final approval to revised project • October 2004 – fully open. <p>Total 13 years</p>	<ul style="list-style-type: none"> • 1990 – Initial approach by private developer • 1991 Feasibility study • 1996 Final approval • 2000 - fully open <p>Total 10 years</p>
Appropriateness of project	High-tech, first world metro	Relatively low-tech/ affordable (like LRT Line 1).
Cost per km US\$mn	57 (est.)	40
Ridership Pass/day/ station	7+ (before ext to final station)	7 (2000) > 16 (2004)
Public reaction	Indifference to protracted delay	Criticism of private profits

3.5

What Scale of Private Financing and Funding has been Achieved?

Governments expected the private sector to *finance* most of the concession project cost and to *fund* most of it too (Manila MRT3 was different with the private sector solely providing financing). For many politicians and government technocrats this was the key motivation for supporting the concession approach. **Table 3.4** summarises the original financing arrangements for the concessions.

The main characteristics are the following:

- BTS was set up to be wholly private financed/ funded – US\$1.2bn, of which US\$0.6bn was in \$-denominated debt
- The Blue Line concession (excluding the land/ civil works) was set up to be wholly private financed/ funded - US\$ 0.6bn. Most debt was from local banks
- KL STAR – was set up with probably half the equity and most of the debt to be private financed /funded– about US\$0.6bn.
- KL PUTRA – all the equity and almost half the debt was to be private financed/ funded – about US\$ 0.8bn
- KL Monorail – only the equity was to be private financed/ funded – US\$ 0.1bn
- Manila MRT3 – all the equity and debt was private financed – US\$0.7bn. There was to be no private funding.

Thus originally US\$4.0bn of the total US\$ 5.3bn cost was *financed* by the private sector, and US\$3.3bn *funded* by the private sector. Two important comments are appropriate. First, even under this original scenario, US\$1.3bn of the cost of the concessioned projects was to be funded by the public sector (for the KL concessions) + US\$2.5 bn for the non-concession part of the Blue Line i.e. US\$3.8bn of public funding was required in total. Secondly, the concessions were not all financially viable. Government has already had to rescue the operations of the STAR and PUTRA concessions, taking the assets back into public ownership. Meanwhile in Bangkok government appears to be publicly committed to buying back both concessions at a reported cost of US\$1-2bn¹².

3.6

Has Private Financing Achieved its Expected Return

In some cases the clear answer is ‘no’ (Bangkok BTS, STAR, PUTRA), in some cases it is ‘too early to tell’ (Bangkok Blue Line, KL Monorail), and in the case of MRT3 the answer is probably ‘yes’. This latter project alone is ‘successful’ in financier terms, but government does not consider it financially successful; for it carries the operating risk, and is requiring to fund a reported extra US\$30-60mn pa above what was budgeted¹³. Meanwhile BTS is at an advanced stage in restructuring its finances, STAR and PUTRA have failed and been taken back into government ownership, and the jury is out on the other projects.

¹² even though BTSC is at an advanced stage in restructuring its debt, and it is not clear this is financially necessary

¹³ This is due to optimistic revenue and possibly operating cost estimates

TABLE 3.4 CONCESSIONS PROJECTS – FINANCING CHARACTERISTICS

Project	Cost	Equity	Debt
Bangkok BTS	Bt 55.4bn (US\$1.23bn)	March 2004 <ul style="list-style-type: none"> • Tanayong 28% • CTF Resources 17% • Credit Suisse First Boston (HK) 13% • ITD Special Purpose Vehicle Co 10% <u>18.5bn</u>	Originally <ul style="list-style-type: none"> • SCB – baht 11.2 • IFC/KfW – US\$ 25.2 • Other 0.6 <u>37.0</u>
Bangkok Blue Line	Bt 25.2bn ¹⁴ (US\$0.63bn)	<ul style="list-style-type: none"> • CH Karnchang • Natural Park • BECL • 3 banks <u>7.2bn</u>	<ul style="list-style-type: none"> • 4 domestic banks - Krung Thai, SCB, Ayudhaya, Thai Military Bank (check) • Suppliers credit 11bn 7bn <u>18bn</u>
KL STAR	MR 3.43bn (US\$0.90bn)	<ul style="list-style-type: none"> • Malaysian Gov't 50% • Taylor Woodrow/ AEG (Adtranz) JV 30% • Other 20% <u>0.66</u>	<ul style="list-style-type: none"> • Govt soft loans 0.70 • Commercial loans 2.07 <u>2.77</u>
KL PUTRA	MR 5.85bn (US\$1.54bn)	<ul style="list-style-type: none"> • Renong Bhd 1.2bn 	<ul style="list-style-type: none"> • Govt Support Loan 1.5bn • Commercial debt 1.9 • Other (land dev't etc) 0.8 • + unaccounted for 0.45 <u>4.65</u>
KL Monorail	MR 1.18bn (US\$ 0.31bn)	As listed <ul style="list-style-type: none"> • MTrans 53% • Other – public, directors 47% <u>0.26bn</u>	<ul style="list-style-type: none"> • Gov't soft loan 0.30bn • Infra Fund soft loan 0.62bn <u>0.92 bn</u>
Manila MRT3	US\$ 678mn	<ul style="list-style-type: none"> • \$ Phil Developers (Filestate, Ayala Land, Anglo Phil, Greenfield) • Ramcar • Others <u>190mn</u> 	<ul style="list-style-type: none"> • Forex: JEXIM, Czech 378 • Local FCDU banks 110 <u>488mn</u>
TOTAL	US\$ 5.31bn		

3.7

Summary

This assessment is a combination of factual evidence and judgement and in some respects cannot be validated until more time has passed. We have noted that governments' expectations were to some extent unrealistic and that they have now become more realistic. With these caveats we conclude that:

1. Three of the six projects would be justified in terms of government's overall objectives were a post-evaluation carried out (Bangkok BTS, KL PUTRA, Manila MRT3), one probably would (STAR) and it is too early to tell for the remaining two (the Bangkok Blue Line and KL Monorail).
2. Most projects would not exist today without the private concessions.

¹⁴ When the civil; works etc costs are added the total cost of the project was Bt123.4bn, about US\$3.1bn

3. The evidence is, while limited, in favour of private concessions over public procurement. Its benefits appear to outweigh significantly the higher cost of private capital.
4. The six concession projects cost US\$5.3bn (+ US\$2.5bn for the Blue Line civil works). Of this US\$4.0bn was raised as private finance of which US\$3.3bn was to provide *funding* and US\$0.7bn *financing* (to be repaid by government). However two caveats should be made:
 - The public sector still had to raise US\$3.8bn (US\$1.3bn + US\$2.5bn) and pay back US\$0.7bn
 - The original financing models have often failed. Private finance has not earned its expected return in many cases. Investors and bankers have lost substantial amounts; and they are not interested in undertaking future projects on a similar basis. These models are, with the exception of BLT, not sustainable.
5. In Malaysia the concessions have contributed to Malaysia's high-tech reputation abroad, and in one case have created a potential export industry.
6. There is evidence generally (and in Malaysia particularly) that government's understanding of the complexities of public transport and urban transport management has accelerated as a result of the concessions experience. They are now in a position to manage the sector more effectively, and to increase the benefits of future MRT projects through their actions.

The concessions were not the text book examples that we read about, and only one was subject to strong competition. In most cases it may be expected that the private concessionaires were well-connected and that the protection of the concession contract was supplemented by confidence that influence could be brought to bear if things went wrong; yet when they did government was generally firm and the investors and creditors were not saved. However when government itself suffered financially, accountability was not so apparent.

Our overall conclusion is that this experience is in many respects encouraging. Even in quite hostile environments and in the very early days of private sector concessioning beneficial projects have been implemented. We now turn to the experience of the comparator cities, before considering how we should build on this experience.

4 Experiences of Comparator Cities

4.1

Overview

London, Hong Kong and Singapore are all recognised to have innovated in the development of their MRT and urban transport systems and to have achieved some degree of success. This section reviews their experiences to identify future directions that may have application appropriate in East Asia's large cities. This experience is detailed in **Annex C**, and summarised here in **Table 4.1** below.

TABLE 4.1a KEY LESSONS FROM LONDON'S EXPERIENCE

Transport strategy	<ul style="list-style-type: none"> • A well-resourced Authority with political accountability can develop/ implement an effective transport strategy. This requires an integrated package of traffic management, demand management, public transport and highway improvements • The planning of public transport benefits from this integrated framework. TfL have a duty to deliver a coordinated public transport system • Experimentation and innovation can bring rewards, in the light of changing circumstances and opportunities • User charges from demand management can contribute to sector funding. Establishing a sustainable funding strategy is challenging and very difficult
Buses	<ul style="list-style-type: none"> • Regulated competition of urban bus services is effective and performs better than full deregulation
Rail Investment	<ul style="list-style-type: none"> • New rail investment is always difficult to justify. There are public finance constraints and a wariness of the rail sector by the UK Exchequer • Project development is time-consuming/ costly as guidelines and procedures have repeatedly changed
Croydon Tramlink	<ul style="list-style-type: none"> • Professional well-resourced planning can deliver a technically sound scheme • A technically sound scheme + strong political support provide the basis of a successful LRT scheme. • Involvement of potential private sector partners can improve scheme design and viability. • Caution is needed in assessing the initial commercial performance of new light rail systems.
Docklands Light Railway	<ul style="list-style-type: none"> • The early implementation of a project demonstrated commitment, that catalysed development – even though the project was not ideal • Design and build contracts can deliver on time and budget but, unless carefully specified from the outset, clients requirements may not be fully met. • Securing developer contributions to capital costs can be very difficult in the absence of a clear, enforceable framework and will usually have conditions attached. • Both construction and operating concessions can be good value for money and in combination can provide flexibility for a developing railway.
London Underground	<ul style="list-style-type: none"> • PFI's can relieve the public sector of investment surges. • The performance of PFI's can exceed that of conventional procurement but this is not

PFI's	guaranteed and depends on the design of the individual PFI.
London Underground PPP's	<ul style="list-style-type: none"> • Long term concessions with limited definition of requirements create uncertainty, complexity and risk premia. • This increases the cost of the concession. • Setting up such concessions can take considerable time and cost. • Concessions of this kind are a way of evening out demands on public sector finance + they secure political commitment to long-term financing • Whether, on balance, they represent improved value for money is open to question.
Privatisation of Regional Rail System	<ul style="list-style-type: none"> • It is difficult to get the correct structure for such a complex operation right from the start, change in the light of experience is necessary. • The high level of fragmentation has realised real competition in operations. • But fragmentation brings with it problems of coordination (and interface costs). • Infrastructure privatisation has been less successful than that of operations/rolling stock • This form of privatisation exposes costs and receipts in a way not previously evident and forces government to face up to these. • The process of privatisation is lengthy and costly

TABLE 4.1b KEY LESSONS FROM *HONG KONG'S* EXPERIENCE

Transport strategy	<ul style="list-style-type: none"> • A well-resourced technocratic government using consultants effectively, and with political authority, can produce an effective land use/ transport strategy. A single tier of government helps • There are benefits in integrating development and transport planning. The property-funding model has contributed to achieving this • Without a 'level-playing field' between private vehicles, buses and rail, MRT demand and rail financial performance are uncertain • Rail investment requires justification in terms of government's overall objectives, rather than relying on the results of a convenient funding model
Rail Funding	<ul style="list-style-type: none"> • Uniquely HK has developed its MRT with no public funding. But this property financed model has run its course. Future projects are likely to require explicit public funding rather than rely solely on this cross-subsidy¹⁵
Rail Operators	<ul style="list-style-type: none"> • Operators established under statute and with management and commercial autonomy can become major assets - locally, in the Region, and more widely • Effective rail operators provide a means for government to implement its project priorities. In HK the operators carry out the functions of many private concessionaires - developing, financing, implementing and operating projects

¹⁵ Under this model government grants property development rights, and the operators secure revenue from development gain and property management. This form of cross-subsidy has allowed taxes to remain low, ensued strong integration of land use/transport and provided a strong discipline on the operators

	<ul style="list-style-type: none"> • Government could with advantage engage the experience of operators in policy and strategy development • The 2-operator model developed in HK for historical reasons has run its course, and a single operator is now being created • A single poor project can undermine an operator's finances for many years
Project Development Process	<ul style="list-style-type: none"> • The accumulated experience of many projects has created an efficient project development process, that delivers projects competitively to time and budget • Major cost economies are achievable when an investment programme is focused upon one organisation • Even in HK, problem projects have been implemented. Care is required in assessing the initial commercial performance of rail projects
Ticketing and fares	<ul style="list-style-type: none"> • Octopus demonstrates that a multi-operator ticketing system can bring major benefits, in the most complex of city environments - even when fares are not integrated

TABLE 4.1c KEY LESSONS FROM SINGAPORE'S EXPERIENCE

Transport strategy	<ul style="list-style-type: none"> • Government's focus on <i>long-term</i> land use/ transport strategy has proved remarkably effective. The existence of a single tier of government and a single organisation with sector authority (Land Transport Authority) has helped • A balanced transport strategy is central to the nation's development. Its sustainable core has remained unchanged for 30 years. • This strategy creates a 'level playing field' between cars, buses and MRT within an integrated strategy. It has required constant monitoring and adaptation in the light of experience • The technocratic civil service and upward pressure exerted by citizens drives forward ambition and performance continually • Integration has been the cornerstone of MRT strategy. Progressively MRT projects have improved integration with the existing transport system, and with land use (government has considerable control over land use)
Rail Strategy and Funding	<ul style="list-style-type: none"> • Rail projects in Singapore are always recognised as having a large opportunity cost – and decisions are always difficult. They are made following in-depth analysis and are taken holistically in the context of overall policy • The healthy state of the nation's finances has allowed government to fund MRT. This has substantially simplified project development • Government has explicit funding guidelines that have remained essentially unchanged for many years, and that it adheres to. Once implemented, no public funding is provided. • Government has actively monitored international experience of PSP, but has not to date found advantage in it
Rail Operators	<ul style="list-style-type: none"> • Singapore recently created two multi-mode ('vertically integrated') operators. It is unclear yet whether this model will perpetuate
Project Development	<ul style="list-style-type: none"> • Singapore's experience has accumulated to produce a sophisticated, effective process • Projects are readied for implementation when an 'in principle' implementation decision is

Process	<p>made. However implementation takes place only ‘when the time is right’. There are clear benefits from this sophisticated form of decision-making</p> <ul style="list-style-type: none"> • Land speculation has forced secrecy in project development until key decisions have been reached, when civil society is actively involved • where delivery to cost and budget are routine. • Even in Singapore, care is required in assessing the initial commercial performance of rail projects, where outturns have not always been as expected
Ticketing and fares	<ul style="list-style-type: none"> • Translink forms an effective public marketing/ ticketing face of public transport in Singapore

4.2

Summary

The comparator cities have mapped out a range of experiences, some unique to their environment, but some with wider application and relevance to East Asia. We now look forwards in this report, to future concessioning policy and draw on this body of experience.

PART B BEST PRACTICES

5 Future Context

The concession projects examined were all developed in the period 1990 – 2004. Their development straddled the defining period for MRT concessions, when two events, both adverse coincided. First was the succession of the Asian economic crisis, SARS, 9-11 and bird flu – events that particularly hit Asia; and second was the growing experience of MRT concession projects worldwide that opened, and all too often failed to meet their expected financial performance.

In combination these events have changed the environment for MRT concessions fundamentally. The overall scale of private financing in infrastructure in most of Asia has radically reduced, as the reality and scale of risk has become obvious. And experience of the MRT sector in particular has led to changed perceptions and attitudes - **Annex E** summarises these based on interviews. There is no doubt that the future will need to be different from the past.

This is both a problem and an opportunity, and it poses a strategic question about the path ahead. The *problem* is obvious – that private financing has been a driver of

MRT development in cities such as those studied, and we have seen that it has delivered much. In particular it has quickly created embryonic MRT networks that are changing the terms of the urban transport debate and opening up new strategic opportunities for their governments. For many large cities the loss of private financing would have serious implications. The *opportunity* arises from our strong conclusion that MRT concessions could be much more effective than they are. The market pressures for change reinforce that need and provide the opportunity to drive change forwards.

Some consider that perceived problems of concession ‘failure’ may now require a reversion to public sector MRT development – an option only for increasingly affluent cities/ countries. This argument could have merit were there intrinsic flaws in the concession approach; but our conclusion is that this does not appear to be the case – rather, private concessions can lead to disappointment if governments have unrealistic expectations or the concession regime is not correctly structured. There are problems, causes and solutions and by applying our collective experience there can become more successful. Concessions are not the uniform answer to MRT development – a careful balance needs to be struck between the pros and cons of public ownership and public regulation of private concessions in the light of local circumstances and competencies. But a simple reversion to public sector development risks failing to secure the undoubted advantages that private sector concessions have delivered¹⁶.

With this perspective we now turn to best practices that will allow governments to drive forward MRT development where it can be justified, using private sector participation in the public interest.

¹⁶ In many cities we would characterise this strategic choice in the following terms:

- The evidence is that private sector concessions appear to be more successful than their public sector equivalent (say their performance is 6 out of 10, compared with 4-5)
- This report sets out how the performance of concessions can be substantially improved – from 6 to say 7 - 8

If governments turn their back on this experience there is a risk of proceeding with a no-doubt improved public sector performance (of say 5 - 6) instead of the private sector concession route of 7 or 8

6 Best Practices

There are two major areas where change is necessary. The first concerns government's role – and its essential role in planning and coordination. The second concerns concession design and financing, where much has been learned, and new modalities offer promise.

6.1

Governance

Large cities pose considerable transport management problems just about everywhere, and all the case study cities are struggling to improve their performance. The more successful they are in doing this the greater MRT benefits will be – and the easier it will be to justify such projects rationally.

The *ideal* is an **urban transport (or public transport) authority** with political legitimacy and revenue-raising powers, responsible for determining and implementing strategy and regulating the sector; combined with a mechanism for coordinating and decision-making with other agencies and levels of government. But this ideal is rarely reached, even in developed cities (London is an example). It is nevertheless encouraging that this path is being pursued in Kuala Lumpur and to some extent in Bangkok.

We conclude that **it is essential that government undertakes certain functions**. If it does not, then implementation may well happen (the private sector has proved enormously responsive to any vacuum left by government), but success will be much less than it should be. These *essential functions* are shown on the next page. It is not necessary that government itself undertakes these, but it is essential that it ensures they are carried out to its satisfaction. The private sector may assist to considerable effect e.g. in bringing practical experience to project identification (as with Croydon Tramlink, UK described in Annex C).

Many of these functions concern the **government's planning and coordination effectiveness**. It is here that change is required. Government's focus also needs to change from infrastructure and trains to the operating railway and creating a sustainable MRT business, from which wider community benefits will flow. We have seen that a good MRT operator can be as important a city asset as the more obvious infrastructure and trains.

Government's Essential MRT Functions
<ul style="list-style-type: none"> • Determine the future MRT <i>network</i> (the framework for project identification) • Determine the <i>project development process</i>, and how those affected can participate • Define the <i>MRT role</i> (its target market and tariff) and how it is to interface with buses/ other rail services • Determine the <i>route</i> - key station locations, vertical alignment and environmental acceptability, impact on road network, integration with other lines • Determine the purpose of <i>engaging with the private sector</i> (improving planning effectiveness, raising private finance, operational efficiency) • Determine the maximum <i>scale of public investment</i> on the basis of external benefits • Define <i>integration</i> requirements, particularly those that cannot be retro-fitted • Prepare government's own <i>business case</i>, on the basis of its rigorous forecasts • Determine the <i>subsidies</i> that are justified (e.g. to classes of users), and how target these efficiently and acceptably¹⁷ • Define <i>MRT performance specification</i> (including capacity requirements) – that provides the basis for regulation • <i>Structure the concession contract</i> to meet government objectives and secure compet'n • <i>Acquire land, ensure compensation and / or relocation</i> for those affected. • <i>Regulate</i> by administering the concession contract/ otherwise

6.2

Urban Transport Policy

All case study cities have **transport plans**, sometimes these are well devised, and sometimes decisions are based upon them. But more often than not the plans are not well devised, and decisions are not based upon them. 'Hard-nosed' plans are needed, with projects identified that are justified in overall terms, implementable and financable. This requires the plans as a whole to be affordable, and to address key conflicts; the comparator cities substantially have such plans but many existing plans in the case study cities fail on both counts.

Policy should strive to provide a **'level playing field' for all transport modes**, through its tax/subsidy and regulatory policy. This is approached in Singapore, but it is an exception. When private cars are subsidised, or buses are subsidised or allowed to compete freely with MRT, or when competing road/ MRT projects are developed MRT benefits suffer and government funding support needs to be higher than it need or should be.

¹⁷ Avoiding the reality or appearance of subsidies increasing the private concessionaire's profits

The case study experience shows that politicians, government technocrats and the public usually resent ‘helping’ concessionaires by implementing measures that benefit the concession project – because that help is interpreted as (simply) increasing private sector profits. This is most unfortunate, since government should want success as much as anyone. It raises the question of **how to incentivise the public sector to want MRT success?** The answer is to structure the concession contract so that the public and private sectors share the risk and rewards, and both parties then gain from success. We discuss this below.

6.3

Funding and Financing

We all – governments, project developers, bankers, investors and advisers - now know the financial realities of MRT projects. These are not the public sector cost-free option many expected. Instead they require large public funding, which may be paid up-front, or later by means of concessions. As one interviewed financier put it:

“Rail projects are unique in having a high capital requirement, producing a low return on capital, having a long gestation period and providing considerable construction risk and commissioning risk and ridership risk. The only redeeming features are that once committed, they are incredibly difficult to stop, once there they are essential - they will never be closed, and once built they are (with maintenance) there for all time”.

Funding – Because MRT projects are costly, and their revenues rarely cover all their costs, there is a funding gap that the public sector must meet – it is usually a large gap, measured in hundreds of millions of US\$. This it can do by providing finance up-front, or it can defer the ‘pain’ until later by procuring a private concession, that provides the necessary financing, to be repaid later at a cost (the rate of return).

Sometimes people try to avoid this logic. Some argue that the private sector will avoid this public need, but this is to misunderstand the reality. Some argue that non-farebox revenues can avoid the need for public funding. The reality is that:

- MRT projects will always¹⁸ require large public funding. The scale will depend upon government policy (just described) and the allocation of risk (discussed below)
- Ancillary revenues (from advertising, concessions and the like) are useful but unlikely to transform the project finances, and
- Property development associated with metros has a strong planning rationale, and will contribute to the project finances by attracting traffic. The granting of development rights may reduce the financial burden when the

¹⁸ Except when a new project is bundled up with the cash surplus of an existing project; and exceptionally where the Hong Kong property finance model works (some cities in China may be examples)

public finances are hard pressed. But property gain is unlikely to provide a secure source of income for financing (indeed banks will usually discount it).

Financing – has a huge impact on the development and success of MRT projects. Private financing is only likely to be available for well prepared projects that are thereby considered deliverable in all respects. This imposes a rigid discipline on project identification, and focuses upon the core risks – land, permissions, relocation, utilities, interaction with the highway, and interfaces with property developments. Only when these issues are faced and risks are managed acceptably, will private financiers agree to financing – and implementation take place; private financiers will then focus critically on implementation time, as delay leads to additional costs.

The situation may be quite different with public financing – usually ODA in developing countries but sometimes own-budget financing. Then there is an arms-length relationship between ODA provider and the borrower who prepares the project. Government project preparation has often been less than adequate, and major problems have then arisen - sometimes changing the project substantially. When this happens, delay is common, costs rise and additional loans are agreed. Such changes would have an immediate impact on a concession project, with very real consequences for the key stakeholders. But with public sector procurement effects are dispersed and consequences may not be severe. Public financing thus provides less discipline in project preparation and implementation, and may result in lower levels of success.

However private financing is more costly than public financing; it is the more attractive financing terms offered by ODA that often attracts governments. They therefore need to weigh carefully the balance of advantage between financial efficiency and the cost of financing. We have attempted to do this in section 3, by comparing the cost of the case study projects with international public sector financed benchmarks. The report has concluded that privately financed projects have performed well in cost terms - in other words that the efficiencies appear to have outweighed the additional costs of finance.

Sometimes it is argued that private concessions may be subject to corruption, and by implication that public sector procurement is not. Our research does not support the contention that private concessions are severely affected by such practices. The important finding is that taking everything into account, private sector concessions compare well with international public sector benchmarks. The Manila experience of private and public procurement, while limited, supports this conclusion.

Care is required when public and private sector financing is combined. ODA financing is administratively time-consuming but predictable, while private financing can be rapid but its timing depends on project preparation/ contract negotiations that may be unpredictable. If – as with the Bangkok Blue Line – a private concession is scheduled to follow ODA civil works, a failure of

coordination can cause substantial delay. This does not argue against ODA financing, but for the management of interface risks.

6.4

Ownership, Control and Regulation

The Thai and Malaysian experience raises the question of *whether government ownership of MRT assets is necessary to resolve existing problems – or whether this can be achieved by private concessions. And if it is, how should government control and regulation be provided for?*

Government requires thinking through exactly what it wants from the procurement process. For example, project development has often been driven by the requirement to secure private financing, and this has led to private ownership during the concession period; but if the focus is to secure operating efficiencies, this may be achieved with or without ownership (through an operating concession in the latter case).

Asset Ownership? - Government will always have an interest in MRT performance (as we have seen in KL, if a concession fails it will have to ensure that operations continue), and control and regulation will therefore always be necessary. This exercise of control does not however necessitate ownership of assets. Whether or not assets are owned by government should depend upon local circumstances and the competences of the authorities. Hong Kong and Singapore have highly competent public sectors, sound public finances and governments that resist undue meddling – all factors that favour public ownership. But where these characteristics do not exist, or others of the following factors apply, a different conclusion may be reached.

Factors favouring Public Ownership	Problems of Public Ownership
MRT projects are permanent. Government will always exist, while private companies will come and go	Public financing constraints may mean the MRT is unaffordable – for many years
The project should be (largely) operated in the public interest. Government is the best judge of this	Government rarely achieves the efficiency and market-orientation of good private sector companies
Success requires integration with the transport system and depends on transport policy/ strategy. These are more likely to be managed to suit if government owns it	Public ownership is prone to political meddling
When things go wrong government owns some major project risks. It may therefore own the assets	Private companies can achieve cross-sector and cross-system synergies not available to city governments
Future public interest requirements are unknown. Government ownership provides flexibility in allowing for them	Public financing is required for major renewals and system extensions. This may not be affordable at the time is required

Control and Regulation - Providing government knows what it wants and how MRT systems work it can exert effective *control* through the concession agreement, providing this defines clear outputs linked to a payment mechanism that aligns performance with public service objectives. *Regulation* in large part comprises administration of the concession contract; the more specific the performance provisions the more effective regulation can be. Only if there is interaction between concessions (e.g. by requirements of track scheduling) or if issues cannot be handled by contractual arrangements is a separate regulatory body likely to be necessary.

Integration and Extensions - The Thai and Malaysian governments have come to recognise that they now need to integrate their existing systems and then extend them. Cities in this position may question whether it is possible to do this efficiently with private concessions. It is of course early days (the first MRT concession opened only 12 years ago in Manchester UK) but there are a few examples of cities that are doing this (Manchester UK is one, London Docklands another). They have faced problems concerning the incorporation of extensions, and the management of multiple concessions with different contractual timings, but some solutions have been and are being found. The alternative approach has also sometimes encountered problems when establishing an efficient public procurement agency. The evidence is that both private and public sector routes are demanding. Both face problems and both can provide answers, depending upon circumstances.

Concession Buyback? – When this has been proposed it is usually in the context of government taking over the management role. This may be argued on several grounds: as necessary to achieve control (removing contractual barriers to change), clarifying responsibilities and removing any modal bias, making it more likely that government will implement integration. But against this there may be draw-backs: losing the benefits of private concessioning described herein, losing the operator management experience and incurring a large financial cost that would otherwise be unnecessary.

Summary - There is no simple paradigm for ownership and control of MRT's. Ownership is not necessary for control and it comes at a price in reducing the availability/ benefits of private financing and ownership. The more important private financing, the more attractive the private ownership/ concession route; and the less certain the city is of what it wants the more attractive the flexibility of public ownership. The key is for the city to establish clear objectives and plans and then devise a regime that suits these and its own financial and institutional resources: there are plenty of examples of joint public private schemes to choose between. Making these choices requires great care as the consequences of the wrong choice can be costly and long lasting.

Project Development Process

MRT system development has been described as a huge exercise in the management of complexity. It poses a massive challenge, and may be carried out more or less efficiently. The main lessons of experience are the following:

1. Government should define an efficient *process* comprising the sequence of tasks and decisions to take a project from concept to successful operations efficiently. This should be more-or-less continuous, as should the required staffing (only rarely is such a process developed)
2. Government should undertake substantive, *front-end feasibility work* to identify a deliverable project (this is a characteristic of the comparator cities, and was absent from most case study projects). The involvement of potential private sector parties can assist in achieving this. Influence is great at this early stage.
3. Many focus on the *technology* of rail systems; but this should usually not be the issue. Government should develop a performance specification, and the private suppliers compete to provide a system that is fit-for-purpose. Occasionally technology itself may be important – in catalysing property development or in creating a domestic export industry.
4. MRT assets are long-lived and viability depends upon *forecasts* of the future. Experience is of pervasive ‘optimism bias’ in forecasts of costs and ridership/ revenues, with ridership repeatedly overestimated – **Annex D** records the success of projects internationally and for the case study concessions. This problem poses a dilemma for decision-makers. All forecasts therefore need to be ‘reality-checked’ against the known performance of operating railways. Only in this way can confidence be developed in them, providing the basis for sound decision-making.
5. Decisions taken during planning and implementation substantially determine *operating success* – and therefore project success. This is because they commit most operating costs and revenues; and once the project is open it is too late to retrieve the situation. The problem arises substantially from the dominant focus on ‘project completion to time and budget’.
6. *Operating success* is also determined by government’s actions in creating a sustainable MRT business that in turn requires a sustainable operator. This requires the operator to be established with clear objectives, basis for financing, and management autonomy. Thereafter government needs to avoid actions that, maybe inadvertently, undermine the sustainability of the business. The study has highlighted a frequent failure to understand the critical nature of this issue.
7. When governments determine to implement a *programme* of projects through one or more agencies (public or private), *large* cost economies are achievable. This approach provide one of two promising approaches to reducing MRT costs in Asia (the second being increasing competition with the advent of the PRC in particular as a major MRT equipment supplier/ project developer).

Concession Design and Financing

Many improvements in this area are possible. Government's **business case** provides the basis for concession design, by identifying and quantifying where possible project financial and other outcomes and risks. Governments often attempt to transfer almost all risk to concessionaires without recognising its impact upon costs; this will often not be in the public interest. The determination of risk allocation requires contact with potential bidders in order to establish clearly their appetite for risk – something that may change quite quickly in the light of macroeconomic, country or sector events.

The following principles should guide **risk allocation**:

- 1) Risk should be allocated to the party best able to manage it. But a city government may not be able to carry much risk, because it has a limited revenue base (if things go wrong it may be unable to fulfil its commitment).
- 2) So risk allocation needs also to have regard to the ability of the parties to carry risk.
- 3) Risk allocation is a motivating determinant of behaviour. If government shares risk, it will strive with the concessionaire to make the project successful; but if it does not it may avoid such actions that are seen to reward the concessionaire. So risk management should be used proactively to engender action in the public interest
- 4) There is a body of risk that neither party is able to manage, and that depends upon future events that may be unforeseeable. Here there is a requirement that the parties commit to work together to develop an acceptable solution. This requires a *public private partnership* in the true sense of the phrase, rather than a confrontational contractually-based relationship.

Concession options – Asia's experience has been primarily that of BOT concessions, often developed on the basis of experience in the power and expressway sectors. We now know that these are not viable in the MRT sector¹⁹. Even when applied to equipment and operations (as with the Bangkok Blue Line), the BOT model is questionable - as it would be coincidental if the relevant project costs just happened to be covered by the revenues. There is no reason why this should be the case.

However there are a number of concession forms with promise that may have application in Asia:

- 'Reverse-tender' BOT. This is a development of existing practice, except that bids are evaluated on the basis of the lowest public sector subsidy required (subject to this being less than the maximum justified on the basis of the project's external benefits)

¹⁹ Moreover their success in other sectors is now recognised to be far more limited than considered in the early 1990's

- A BLT concession to implement the infrastructure, followed by an operating concession (a development of the Manila MRT3 example). It should be noted that the MRT3 concession was in many respects successful
- A PFI concession – this has been the subject of much attention and application in the UK. These concessions are characterised by significant risk transfer to the private sector, output requirements being specified, long-term responsibility for maintenance remaining with the private sector, and payments linked to performance and availability. The UK experience of this concession form has been promising.

The decision on concession form has often been made early, before the relevant facts have been available. It should be made only after the business case has been prepared.

Concession terms - The concession terms should focus upon the requirements of the selected concession form. Attention should be given in particular to defining the output requirements and availability/ performance requirements that will deliver effective service. These parameters can then be regulated and may form part of the payment to the concessionaire. Attention is required to following specific issues:

- *Commercial risk* is often the core issue – we have seen that time and again it is the ridership forecasts that have failed to materialise. The full transfer of this risk to the private sector is now unlikely to be acceptable or desirable. The main options are for government to carry this risk (as with Manila MRT3), for the risk to be shared (for example government guaranteeing a minimum revenue, and sharing in the upside), for the concessionaire to be paid on an availability/ service quality basis, or for a combination of the latter options (with payment partly on ridership and partly on availability and service quality).
- Asia's experience has shown conclusively that *macroeconomic risk* can be large. It is necessary that government carries much of this risk (foreign exchange/ devaluation, inflation, taxation) explicitly in the concession agreement. Asia's experience has also demonstrated the wisdom of a firm but pragmatic approach to long-term concessioning – when things go wrong (they usually do).
- MRT projects need to be part of the transport system. *Integration* requires both government action (e.g. that it proposes to take in respect to demand management, fares integration, coordination with the buses) and government specification of actions required by the concessionaire (e.g. to create interchanges with other lines, provide for physical transfer with buses/cars at stations, provide compatible ticketing equipment). JBIC have raised the issue of *technical integration*. The need for this in part depends upon government's objectives (PUTRA was automated to project a high-tech image of Malaysia for example) and upon the MRT function (some systems are full metros, some LRT systems and others people-movers). It also

depends upon history (if the first project was inappropriate, the argument for compatibility would be undermined), and upon technological development (this moves rapidly and it would be perverse not to seek the benefits of this). This apart there is obvious sense in government setting out broad technical parameters to which MRT systems should adhere.

- Concession agreements need to specify requirements for the *system extension*. This may specify what extensions are to be implemented, and how they are to be provided for contractually (the London Docklands combination of Design-Build-Maintain and Operating concessions has been effective), or it may make a general provision that the concessionaire is to be no worse off following the extension.

Financing Arrangements - Asia's experience has demonstrated the wisdom of the defining clear principles to govern the financing requirements. As an example, the following guidelines were developed for the Bangkok BTS concession, and have proved the test of time:

- i. Completion of construction to be protected against any mishap that may befall any principal sponsor during construction.
- ii. A major proportion of the debt to come from local banks to safeguard the project from political interference and reduce the foreign exchange risk
- iii. The construction consortium to share the risks of initial operations to ensure completion to time and quality
- iv. The financing package to be adapted to the cash-flow.

Such considerations lead to a conservative debt: equity structure, a focus on domestic debt (to reduce foreign exchange risk) and a recognition of advantages of some foreign bank involvement.

Development banks such as the World Bank, ADB and JBIC may become involved. They provide long-dated loans at attractive interest rates and may provide guarantees. However to date concessions have usually developed rapidly/unpredictably, and this has mitigated against accessing their finance or guarantees as they require a formalised process with due diligence and due process to be confirmed. But when achieved – as with IFC and the BTS concession - they provide confidence for other investors.

6.7

Operations

The comparator cities have developed operators that have maintained a high quality of performance over many years (Hong Kong's MTRC is an example). This has required firm government action, first to establish and then sustain them (or at least avoid undermining them). This is difficult to achieve, yet produces large dividends for government and the wider community. However we have found little recognition of this in the case study cities, or indeed interest in MRT operations and their impacts.

High quality operators have emerged in the case study cities (Bangkok's BTSC is an example) but it is not obvious that their value is recognised, or that care is required by government to sustain a good operator. In part this appears to result from the private concession form, creating a wariness to 'help' an operator become successful (hence more profitable). The solution we have described is designed to create an identity of interest through joint risk sharing provisions of the concession, whereby both parties stand to benefit from success; whilst preserving government's necessary regulatory role. MRT operators should be considered core city assets, and government should engage with them in policy dialogue. If their contracts are suitably incentivised then public private partnerships will develop, to the benefit of all concerned.

ANNEXES

Annex A Concession Project Data

The data is sourced from a combination of: authoritative references, meetings with a wide range of stakeholders and (to a limited extent) press reports. Where possible information has been corroborated. This database is considered to provide a reliable basis of information for this study.

Annex B Development of the Case Study Concessions

This section concerns the sequence of decisions, tasks and events that shaped and determined the projects that were implemented, and their effects on implementation and operations and overall success. A section on technical integration associated with the Manila and Jabotabek rail systems is added in the light of JBIC's comments.

B.1

Bangkok

Context - Bangkok is a rapidly developing megacity of close to 10 million people. By 1990 it was renowned for its chronic traffic congestion, and over the subsequent decade vehicle ownership more than doubled, by which time there were an estimated 18.5mn trips/day, almost exactly half private and half public.

There had been strenuous efforts following a German funded MRT study in 1979 to develop an MRT project, the main focus being on what was then called Skytrain²⁰ and Lavalin's attempt to secure financing. This was overtaken by the subsequently aborted Hopewell concession, and by the Lavalin concession being terminated in about 1991.

Against this backcloth and worsening transport problems the BTS opportunity was recognised by then BMA Governor Maj. Gen Chamlong. At that time there was a technocratic government that resulted from demonstrations and public unrest/military intervention. It was determined to restore economic credibility to Thailand after the unrest. It terminated the Lavalin concession, hired Professor Ridley (now Professor Emeritus at Imperial College London, formerly Managing Director of the Hong Kong MTRC, London Underground and UK Tyne and Wear Metro) to identify a Government project (the Blue Line – see below), created the Mass Rapid Transit Authority of Thailand, and on its last night in office approved BTS.

Government policy-making in the field of urban development and transport infrastructure has been problematic. From the late 1980's government organisations were encouraged to enter into relationships with private partners to implement BOT infrastructure concessions. The rapid burgeoning of expressway and MRT megaprojects from about 1989 caused huge problems and conflicts that took many years to sort-of resolve. This is not in retrospect surprising – Thailand was one of the first countries worldwide to take this path to project development. In 1995 a first MRT master plan was produced comprising a large number of such projects.

²⁰ This became the Blue Line, and is not to be confused with the BTS Skytrain

B.2

Bangkok BTS

At the time that BTS started there was no formal project development process²¹ It was enough that a government agency found a concessionaire and contracted a concession with him. No feasibility study was necessary. In 1992 this changed, when the 1992 Concession Law produced a process (although the extent to which this is effective has been questioned).

The Project - BTS was originally to be a Central Area people mover with a capacity of just 10,000 pass/hr/direction, with its technology undefined. It was developed at a time of some frustration that central government had failed to deliver on promised BOT MRT projects. In three respects it was to be a straightforward project: there was one government sponsor – Bangkok Metropolitan Administration (BMA), it was only to use land owned by the BMA, and no public finance was available. It was to fit into a full metro network comprising other than committed concessions - Skytrain (on what became the Blue Line alignment) and Hopewell. The project was to serve the main corridors of commerce in the Central area - Silom and Sukhumvit. However as the project developed the concept changed completely to a full-scale metro, serving the same corridors, but needing to extend outwards substantially to the north to locate a depot site.

Project Development

Key Dates

1990	BMA Governor Chamlong instructs his Officers to seek a concession
1991	Terms of Reference issues inviting concession bids on a full BOT basis
1992	Concession awarded to BTSC Growing recognition that depot site was not feasible, need to change project Decision by BTSC to change concept to 'a HK-MTR metro'
1994	Government announce that all MRT in CBD to be underground – then BTS exempted
1995	BTS route/ alignment/ systems fixed
1996	Financial close
1997	Asian economic crisis
1999 (Dec)	System opens to revenue service
2004	Financial restructuring - agreement with creditors Government announce they intend to buy back the concession

The project took just over 9 years from first concept to revenue operations.

²¹ this is reported to remain the case today

Stakeholders - The key stakeholders in the project were the following:

BMA	The metropolitan government had the powers, owned the land and defined a concession form that required no public finance. Led by the Governor, they had effective technocrats
Anand Central Gov't	This technocratic Government provided a 'window of opportunity' that BMA took. It approved the project.
BTSC Chairman and Tanayong	They were totally committed from the beginning. They attracted ex-HK technocrats who provided much energy, technical and commercial acumen
Environmental opposition	In Government and outside. Forced delay, and pushed the project into the Asian economic crisis
Siemens and ItalThai	The winning turnkey contractor. They provided strong support in often difficult times, and knew how to deal with the local situation
Lenders	IFC and KfW influential in structuring the finances, and providing a robust structure that was to be tested to the limit

Technical Support - With one exception the technical support proved effective. The technical and operational planning in the absence of any substantive feasibility study and facing many challenges produced a project that is demonstrably effective. The exception is transport planning that resulted in ridership/ revenue forecasts far higher than has been achieved.

Concession Contract - Annex A summarises the main elements of the concession contract.

Procurement and Financing - The concession was awarded after a very short bidding period for the low capacity people-mover concept with an undefined technology. After award, the project changed completely.

The three main banks (KfW, IFC and Siam Commercial Bank) agreed on four principles in structuring the project finances:

- i. The completion of construction to be protected from any mishap that may befall any principal sponsor during the construction period
- ii. A major portion of the loans to come from local banks to safeguard the project from political interference and reduce foreign exchange risk.
- iii. The construction consortium to share the risks of the initial operation to ensure completion on time and to high quality.
- iv. The financing package, including support loans, to be adapted to the expected cash flow to allow for weakness during the start-up period.

Implementation Problems - Implementation was subject to many serious problems as follows:

Problem	
Depot	The failure to be able to locate the depot in Lumpini Park changed the project fundamentally, from a small Central area system of 14.5 route kms. to a strategic 23.5 km system that is the backbone of Bangkok's future MRT system
Environmental opposition	Started over the Lumpini depot proposal. Extended to the impact of structures generally. Cabinet decided to underground all city centre infrastructure that caused a major crisis. Eventually BTS exempted.
Asian Economic Crisis	Delays due to the above pushed the project into this crisis, increasing both cost and borrowings (due to the foreign exchange exposure), weakening revenues and causing a fundamental financial crisis.

Operational Problems - The major problem has been an almost total failure by government to integrate BTS with the existing system. No changes to the buses took place. No provision for park-and-ride was incorporated. BTSC was somewhat slow to develop a marketing strategy, but now has an effective strategy. It is considered a markedly efficient organisation. It carries an average 350,000 passengers/day; double that in its first year of operations (2000). In part this represents Bangkokians growing familiarity with BTS, as they find how it can benefit their daily routine.

Success Achieved – BMA are delighted with BTS – it has for the first time promised to reverse the spiral of decline that Bangkok's traffic congestion imposed. It is popular, has helped unlock congestion, and provides the platform for the future sustainable development of the city; and it has done this at no cost to government.

So in all but finances BTS would be considered a considerable success. Its entire life from concept to opening was just over 9 years. It was constructed to budget, and opened on the King's Birthday - one month early. However its year 1 ridership was just one-quarter that forecast. Having said this it is understood that its farebox ratio (revenues/ direct operating costs excluding depreciation) is amongst the best in the world. Thus by any normal MRT standards BTS would be considered a financial success, although it is certainly not for its investors and creditors.

Overall BTS is a story of personalities and politics in the absence of process; of hope, opportunism, professionalism and resolution by the key individuals and organisations involved – mainly Thai; of support by the BMA; of some luck (it was not all bad – the enforced depot change in project proved it's saving in many respects). And it is a story of a flawed, unrealistic concession form – proving finally that such projects are most unlikely to be financially viable anywhere on a stand-alone basis.

Winners and Losers – the major winners were BMA and Bangkok's people who ride the system and benefit from decongestion, and the national government who

have in place the centrepiece of Bangkok's future strategy. The contractors and suppliers should probably be added to this list. The main losers are the shareholders, who have lost almost everything and the banks who will not by any means be fully repaid.

B.3

Bangkok Blue Line

The Project - The project was developed to take advantage of a window of opportunity provided by the technocratic Anand Government. Unusually an MRT expert (Professor Ridley) was contracted to identify the project within a 3-month period. This proved possible because Government owned a large land holding that could be used for the depot. This, together with the 'committed' Hopewell concession effectively committed the Blue Line to its existing corridor. Government's 1995 decision to underground all MRT development in central Bangkok had a major impact on the project (it alone of all projects was affected). The URMAR MRT Master Plan (assisted by OECF) incorporated the Blue Line as a core project. It is the first underground metro in Thailand. Its civil works were financed by JBIC ODA loans, and the equipment, operations and maintenance contracted under a BOT concession.

Project Development

Key Dates - The proposed Lavalin concession took many years to be terminated. Thereafter the Blue Line was identified and implemented in a period of approx. 12 years:

1991?	Proposed Lavalin Skytrain concession failed
1992	Professor Ridley contracted by Anand Government to identify a project for the Government to promote - the Blue Line. Project go-ahead Mass Rapid Transit Authority (MRTA) created
1994	Government announce that all MRT in CBD to be underground
1995	Cabinet go-ahead for revised project on PPP basis
1996	Government award first civil engineering contract
1997	ToR for concession bidding issued, bidding Asian economic crisis
1998	Negotiations for the concession commence
2000	Cabinet approve award of concession to BMCL, contract signed
2002	BMCL sign a supply contract with Siemens Financial close
2004	System opens to revenue service Government announce they intend to buy back the concession

Stakeholders

Anand Central Gov't	This technocratic government provided a 'window of opportunity' that was used to identify the Blue Line It approved the project and established MRTA.
MRTA	Sponsor for its first metro project. Responsible for contracting the civil works and letting the concession
CH Karnchang	Major Thai contractor who determined to take a strategic role in the development of the MRT system
Siemens	The winning turnkey supplier. They provided strong support and delivered cars in record time
Lenders	Thai banks - Krung Thai Bank, Thai Military Bank, Bank of Ayudhaya, Siam City Bank JBIC who provided ODA loans for the civil works

Technical Support - The project was developed by MRTA who contracted a number of consultant groups to prepare the project for bidding, evaluate the bids and supervise implementation.

Concession Contract – Annex A summarises the main elements of the concession contract. This was an equipment BOT concession contract, the revenues financing the electrical/ mechanical equipment and operations and maintenance over the concession period.

Procurement and Financing - The project was the first to be bid under the new PPP Act. Five groups bought the invitation documents, and 2 strong groups submitted proposals. Almost immediately the Asian economic crisis hit Thailand. Negotiations lasted 2 years.

The civil works were financed under conventional ODA (by OECF/ JBIC); but financing the concession proved far more problematic. A major Thai contractor CH Karnchang was the driving force behind the bid. Financial close was not achieved until February 2002, four years after the start of negotiations. A consortium of 4 Thai banks provided the debt.

Implementation Problems

Problem	
Equipment procurement	BMCL close to concluding contract with Mitsubishi/Alstom. In the event Siemens (also BTS supplier) selected
Interactions between civil eng'g and concession	There was a major mismatch in timing with 4 years between the award of the first civil works engineering contract and Cabinet approval of the equipment BOT concession
Asian Economic Crisis	Exacerbated the problems, increasing the cost of borrowings, weakening the revenues, and questioning the viability of the concession form

Operational Problems - BMCL have learned from the initial problems of BTSC. Integration while not good is far better than for BTS, notably in the design at stations, and provision of feeder bus services by BMTA.

The Blue Line opened for revenue service in July 2004. BMCL is thus an embryonic operator. To date it has been proactive in its marketing. Initial ridership with an introductory 10 baht (US 25 cents) fare was about 200,000/ day. This reduced substantially when the first year full fare was introduced. BMCL has fast developed into an effective MRT development company.

Success Achieved, and Winners and Losers - In many ways it is too early to form a judgement. Implementation was problematic for the reasons stated, but was implemented effectively in difficult ground conditions once financial close was achieved. Capital cost (of the concession) is understood to be close to estimates. It is too early to draw conclusions as to ridership.

B.4

Kuala Lumpur

Context - Malaysia has had a strong government led by a visionary Prime Minister intent on transforming Malaysia in 30 years to a developed society (the so-called Vision 2020). Government has put faith in the private sector to lead this change, catalysed by Government's vision. Government has sought to use infrastructure development to achieve the following objectives:

- Drive forward and integrate the Malaysian economy
- Champion and market Malaysia internationally as a high-tech society
- Create 'champion' bumiputra entrepreneurs, with the objective of reducing the economic disparity that Malays had traditionally encountered
- Access private finance to be the engine of change. Government awarded long concessions, with no intention of becoming involved in operations
- Develop a 'green', liveable City Region for the fast-growing capital city.

This ambitious agenda has to be seen against a backcloth of: sustained high-growth and considerable success in developing expressways infrastructure (in particular). Malaysia therefore had the conglomerates, developed local capital markets, and

many skilled technocrats able and willing to respond to the challenge. The expressways success led to confidence that MRT concession projects could also be successful.

KL had the usual transport studies that had recommended balanced policies. The 1986 Klang Valley Study had identified the need for LRT to bring about change in modal choice. But little had happened other than highway development. Public transport was by the end of the 1980's mainly performed by unpopular minibuses. The low cost of locally-manufactured Proton cars and their use (fuel and parking has always been cheap) posed a particular challenge to public transport policy.

The origins of change were the foreign (Taylor Woodrow/ Adtranz) BOT proposal for the STAR project. This government approved and at this time the creative thinking for KL and its region took place. The decision was taken to extend the success of highways privatisation to new areas – KTM (State railway) and urban public transport in particular. The result was the addition of PUTRA, and the KLIA (new international Airport) axis concept catalysed by expressways and the Express Rail Link. The Commonwealth Games precipitated the need for STAR to be extended and the timing of PUTRA – for KL was to be Malaysia's showcase to the world. The Monorail proposal developed as the spine to a 12km 'linear city' that was developed in the heady property days of the early/ mid 1990's.

Malaysia's experience has this been the result of proactive 'planning' in the broadest sense. Dr Mahathir was the visionary. Government did not carry out conventional 'planning', rather a strategy was set, concessions signed and the private concessionaires relied upon to develop successful projects. That government thus provided a broad strategy and the backbone for its delivery. The new government, by PM Badawi and by style thoughtful, appears to be recognising the 'softer' challenge that now exists. In particular it recognises the fundamental institutional problem in the urban transport sector, and is putting in place a strategy to manage the public transport system as a whole – for the first time. This offers the prospect of both tackling the problems of integration, and of delivering much wider benefits to bus passengers.

Overall Success - Much has been achieved, such that Malaysia can be seen to be on the planned path to a developed society. The strategy for the KL region is clearly happening. The highway system is well developed. In KL there are now 3 MRT systems and KTM has an efficient electrified railway.

But not all has been an unqualified success. KTM privatisation failed, and so did the public transport BOT model. But this must be seen in the context of substantial success and the opening of future policy windows that Government appears to wish to pursue.

Set against government's original broad objectives:

- MRT is contributing towards efficiency, quality of life and sustainability agenda
- The people of KL are the gainers, particularly the 400,000/ day who benefit directly from the rail system. Other road users also benefit, as congestion is

less bad than it otherwise would be. Everyone benefits from the reduced pollution and future opportunities that now exist.

- PUTRA and monorail are contributing to the high-tech image of Malaysia. Monorail (and possibly in the future PUTRA) are promoting high-tech exports
- Malaysians have become progressively skilled in understanding the difference between building infrastructure and providing infrastructure services, that are an exportable asset
- Private finance has been mobilised, but no sustainable financing model has yet been developed. However this is now the subject of current deliberations within a broad context.

B.5

KL STAR

The Project - STAR was the result of an unsolicited proposal from Taylor Woodrow/ AEG (later Adtranz) to develop KL's first LRT project. The focus was on minimising the first cost, since this was considered essential to get approval. The alignment (a former disused rail right-of-way to an industrial plant) is a circuitous mostly at-grade radial to the city centre, and the technology a no-frills LRT.

The 1998 Commonwealth Games precipitated Government's request to build a second southern line serving the Games stadium. A short northern extension was agreed to compensate for the expected poor traffic on this new southern line.

Project Development

Key Dates

1990	Promoting group KL Transit Group formed
1991	Potential route identified
1992	STAR incorporated to implement Phase 1 project, concession agreement signed
1995	Phase 2 concession agreement signed
1996	Phase 1 opens to revenue service
1998	Southern Ext opens (for Commonwealth Games) Northern Extension opens
2002	Concession fails STAR assets transferred to SPNB (Gov't asset and operating company)

Stakeholders

Economic Planning Unit (under PM's Office)	Approved the negotiated concession contract
Taylor Woodrow and AEG (Transport Group)	Project developer and main contractor
Malaysian banks	Provided credit

Technical Support - This was led by the concessionaire. It had a strong minimum first-cost focus. Independent ridership forecasts were commissioned.

Concession Contract – Annex A summarises the main elements of the concession contract that was a full BOT concession.

Procurement and Financing - The concession was negotiated following an unsolicited proposal. The promoters controlled the work, sub-contracting aggressively.

Government showed considerable pragmatism in negotiating a financing package that was expected to be adequate. This included Government contributing half of the equity and a third of the debt as soft loans.

Implementation Problems

Problem	
Government support	The expected/ promised support was often not forthcoming – in improving access to stations, in integrating bus services
Asian Economic Crisis	Its main impact was to weaken the revenues

Operational Problems - STAR operates well from the passengers’ point of view, in spite of technical problems. Rather than purchase a proven system, the STAR rolling stock was put together from components with least-cost the objective irrespective of whole-life costs. The result is that the rolling stock requires substantial maintenance and car availability is low (but as demand is lower than forecast there is no shortage of capacity).

Before being taken back into public ownership, the STAR operating company performed reasonably. Ridership started at about 60,000 passengers/ day, one-quarter that forecast. Today with the complete (Phase 1+2) system it has increased to 110,000/day.

Success Achieved - STAR was the beginning of MRT in KL, and was developed in the very early days of PSP. It was constructed in time for the Commonwealth Games and is reported to have carried 70% of people accessing the stadium. It operates satisfactorily and reliably. It currently carries 110,000 passengers/day. Its success must however be judged modest. The corridor is not good (a disused rail right-of-way). The least first-cost approach to its development has resulted in problems that remain. There was little focus on operations and marketing.

Winners and Losers - The winners were primarily the residents of KL who use STAR, and (presumably) the private concessionaire who comprised the main contractors. The main losers were the Malaysian Government (i.e. tax payers) as the equity became value-less and debt was not fully repaid. It is understood that other Malaysian banks lost to some extent but accepted the settlement reached.

B.6

KL PUTRA

The Project - PUTRA is a major component of KL's MRT strategy, comprising two radial lines, linked through and under the city centre. PUTRA followed STAR at a time when Government had decided to implement an LRT system, and following broad transport planning studies, but no feasibility work. Renong Bhd was asked to develop the project - a major Malaysian conglomerate with interests in transportation (they were the concessionaires for the hugely successful North-South Highway), construction, banking (interests in 2 major banks) and telecommunications. They were asked by the Government to start work before signing a concession to meet the Commonwealth Games deadline. Following bidding for a supply contract, a contract was signed with Bombardier for a fully-automated driverless transit system (said to be the world's longest) capable of operating at close (90-second) intervals. This was considered the right high-tech image, albeit it was said to be the highest cost bid on a first-cost basis.

Project Development

Key Dates

1994	PUTRA incorporated Route confirmed, work started
1995	Concession contract signed
1997	Asian economic crisis
1998	Phase 1 opens to revenue service
1999	Phase 2 opens
2002	Concession fails. PUTRA assets transferred to SPNB (Gov't asset and operating company)

Stakeholders

Economic Planning Unit (under PM's Office)	Approved the negotiated concession contract
Renong Bhd	The concessionaire, prime contractor and operator
Bombardier	Supply contract for automated transit system
Hyundai/ Hazama	Tunnelling contractors whose performance was critical
Malaysian banks	Provided credit

Technical Support

This was led by the concessionaire using independent consultants and in-house staff. Independent ridership forecasts were commissioned.

Concession Contract – Annex A summarises the main elements of the concession contract for the full BOT concession.

Procurement and Financing - Renong were invited to implement the project as a BOT concession. There was bidding for the equipment supply contract (that Bombardier won). Renong undertook all other work except for tunnelling that was contracted to Hyundai/ Hamaza. This proved an efficient and flexible structure at overcoming delays given that time was of the essence.

Implementation Problems

Problem	
Start-up	Work had to start before the concession contract was signed
Government support	The expected/ promised support was not always forthcoming – in delivering unencumbered right-of –way, in dealing with the utilities diversions, in allowing PUTRA to operate attractive feeder bus services etc
Tunnelling	Tunnelling under the centre of KL is difficult (first deep tunnels under KL, close to high-rise buildings, with problems of flash floods). The Hyundai contractor had a fixed price contract and lost money
Asian Economic Crisis	The late 1990's property market crash had a major impact upon the concession. Costs increased. Property gain and the large extra ridership expected to part finance the project did not materialise, while the cost of the foreign exchange borrowings increased.

Operational Problems - PUTRA has had no operational problems. The automated transit system is efficient and reliable. Minimal operations/ maintenance staff are required. Ridership has now reached an average 150,000 pass/ day that results in congestion at peak times; there is a shortage of cars. SPNB have constructed an operational car and established a manufacturing facility at the depot, to overcome this problem.

Success Achieved - Today PUTRA is the backbone of KL's public transport system and centrepiece to its future strategy. In terms of government's overall policy objectives it is substantially successful. Its construction was effectively carried out in the face of substantial problems – and it was fully open 5 years after the route was confirmed, and just 4 years after the concession contract was signed. It operates reliably and is popular, carrying an average 150,000 pass/day. Its revenues exceed operating costs by a margin. The concession failed in 2002 as revenues were inadequate to repay the debt, and the PUTRA assets are now with SPNB.

Winners and Losers - The winners are the residents of KL who use the system/ benefit from it, and Bombardier. Renong were a major loser – PUTRA was a major reason that led to their demise. So was Government (i.e. tax payers). The Malaysian banks took a hit, but probably not a major one.

B.7

KL Monorail

The Project - KL's monorail project was conceptualised in the 1980's. Its original objectives were to link 90% of the hotels and shopping centres in the Central Area, act as a distributor between the other transit systems (STAR, PUTRA, and KTM) and form the spine ('horizontal elevator') of a proposed 12-km 'linear city' following the river developed at the height of the mid 1990's property boom.

The original project was for a 16 km elevated Hitachi monorail system. The project was necessarily revised following the Asian economic crisis, and changed substantially: the linear city concept was dropped; the route was shortened from 16 kms. to 8.6 kms, the decision was taken to develop Malaysian-manufactured technology modelled on the Seattle Trade Fair ALWEG monorail, and government agreed that all debt financing was to be public sector.

Project Development

Key Dates

1980's	Project conceptualised
1994	Project company established
1996	Environmental Impact Assessment approved
1997	Concession contract signed for a 16km monorail based on Hitachi monorail Construction started Asian Economic Crisis
1998-99	Everything halted
2000	EIA for new project approved New concession contract signed for a re-defined project
2003	Project company listed on the KL Stock Exchange Open to revenue operations

Stakeholders

Ministry of Transport – Railways Department	Sponsor and regulator
KL Monorail System Sdn Bhd (KLMS)	Concessionaire
DBKL (Municipality)	Involvement with traffic diversions

Concession Contract – Annex A summarises the main elements of the concession contract for a full BOT concession.

Procurement and Financing - The project resulted from a negotiated unsolicited bid. The project changed materially after the Asian economic crisis. Government provided financial support via Government and Malaysian Infrastructure Fund soft loans that together met all debt requirements.

Implementation Problems

Problem	
Asian Economic Crisis	This undermined the project that was conceived on the back of a property boom, using imported technology, and forced a fundamental reappraisal of the project (whose construction had commenced).
Environmental objectors	Many objections were registered on visual grounds. The Prime Minister helped persuade most to accept the project. Several sued for compensation (some are still pending)
Traffic diversion problems	Some problems that required coordination with DBKL (KL municipality)

Operational Problems - The monorail operates well. From July 2004, 8 of its 10 trains have been operating, and full service is imminent. 45,000 passengers/ day use the system. It is attractive to use.

Success Achieved - After major problems and a 2-year hiatus when the project was completely redefined and its financing restructured, Monorail is operating and carrying a substantial number of passengers. It is visually attractive, and operates well, linking many major Central Area attractors and the other rail systems. Revenues (30% from ancillary sources) are said to cover operating costs. It remains to be seen whether it can finance all costs.

The concessionaire KLMS is a wholly owned subsidiary of a holding company KL Investment Group Bhd that has listed on the KL Stock Exchange. It is now aggressively marketing its home-grown monorail technology overseas. This has become a potential export industry.

Winners and Losers - It is too early to say whether there will be any losers. The people of KL who use Monorail or benefit from it are the principal gainers. KLMS (and through them KLIG) are promoting the technology internationally. The impact on them will depend in part upon the finances of the project itself and in part on the export industry developed.

B.8

Manila

Context - Manila is a rapidly expanding megacity with a current population of approximately 11 million, expanding by 200,000 per year. It is situated at the confluence of the Pasig River and coast, and is mostly low-lying, and in part flood-prone. Its road network comprises a few major arteries, and a little developed secondary road network. Car ownership and congestion are high, and most Filipinos use public transport. This has for many years been manifest in very large (20,000 pass/hr/direction) flows of bus/ jeepney passengers down the major corridors. In 1984 Manila's first fully elevated LRT system opened and was an immediate success. Since then ambitions for network development have not been matched by the state of the public finances.

Following the Marcos regime in the early 1980's democracy flourished. The 1990's saw a strong government under President Ramos, promoting an open policy,

deregulation of markets, re-engineering the government bureaucracy and strong support to PSP in infrastructure; and the BOT Law was enacted 1990/91. Then came the Asian economic crisis in 1997, and some loss of policy focus that perpetuates. This environment has not been conducive to effective project development. Latterly there have been challenges to BOT signed contracts and confidence within the private sector has been low. There is today a prospective economic crisis that government is addressing, and that will constrain public sector affordability.

Manila's MRT history started with a Japanese financed metro study for a first line that recommended a subway in the early 1970's. This was considered unaffordable and a subsequent major study recommended a lower cost LRT Line 1. This was bid out as a Government financed project, opened in December 1984, and has been a substantial success (its operating finances were for many years amongst the best in the world).

About 1989 Government decided to bundle the Line 1 operations with a new Line 2, and to bid out this package as a BOT contract. The bidding failed, and after many years delay, it was decided to implement Line 2 as a stand-alone line, with GOJ ODA finance (JBIC ODA loans), advantage being taken of the Obuchi Fund. Construction started about 1998, and the line was opened in phases between 2003 and 2004 (it is forecast to be fully open in late 2004).

With the advent of government's major BOT policy thrust in the early 1990's, and privatisation of the former US forces bases at Clark and Fort Bonifacio, came a wave of private sector projects – Northrail, Southrail, MCX, PNR na Riles, Line 4 and more. Today many projects are still current, and there are new proposals as well. There has been a strong support for MRT development, with few opponents, throughout the last 15 years.

B.9

Manila MRT3

The Project - MRT3 was to be an early demonstration project of Government's BOT policy effectiveness. The project concept was by a project developer who had recognised the success of BOT in the power sector²² and recognised the potential of this model, providing the cost could be kept within acceptable bounds. The project is a fully segregated MRT mostly at-grade/ elevated, using Eastern European streetcar technology, in the median of Manila's main thoroughfare. The need was obvious, having been identified in earlier studies and Government owned the entire right-of-way.

MRT3 is a Build-Lease-Transfer (BLT) concession. The concessionaire MRTC finances, constructs and maintains²³ the project for 25 years and implements commercial developments for 50 years, in return for which it receives a fixed revenue stream and annual rental payments (for property). In effect he takes

²² Manila had had a major power crisis in the early 1990's and had gained considerable experience of BOT power concessions.

²³ Maintenance is financed by government

construction (cost/ delay) and maintenance risk in return for a guaranteed return with property upside. Operations are by Government, who take the commercial risk and a share in the property upside.

Project Development

Key Dates - The project was developed from first concept to full operations in just 9 years. Once financing was in place it took less than 3 years. There was no public participation – this was not required.

1990	Gov't underwrite cost of Feasibility Study by private group ELRC
1991	MRT3 concession concept formally submitted by ELRC Concession bid out under BOT Law Concession contract signed
1991-1993	Government re-examines terms, ridership, risk allocation
1993	New Concession contract signed
1994-5	Legal challenges, change in structure of ELRC (developer led), in specification and in extent and vertical alignment of the project
1996	Gov't decide to go-ahead with the project
1997	Asian Economic Crisis Financial close
1999-2000	MRT open to revenue service (in phases)

Stakeholders

Mr Eli Levin	The original developer, without whom the project would not have happened
Filipino developers	Equity investors in MRTC, interested in protecting their developments + new opportunities
The President + successive Secretaries of Transport	Without whom the project would not have happened
Highways Department	Concerned about loss of road space and future projects
Economic and Finance Ministries	Pragmatic in the face of financial realities.
Squatters (depot site)	Need for relocation of 15,000
JBIC then JEXIM	Provided debt

Technical Support - MRTC employed international consultants, bankers and lawyers. The project was professionally developed. Ridership forecasts were prepared by MRTC for Government (but MRTC took no revenue risk).

Concession Contract – Annex A summarises the main elements of the BLT concession contract. Government takes foreign exchange risk and provides a sovereign guarantee on all debt. MRTC is guaranteed a 15% return on equity on the basis of the lease payments for the railway.

Procurement and Financing - The concession was bid out under the unsolicited bid provision of the BOT Law, whereby matching bids were invited within a period of 2 months.

Equity is mainly from the 4 Filipino developers. Debt is from a combination of JEXIM, Czech suppliers' credit and local banks.

Implementation Problems - The project was implemented effectively by Sumitomo (the turnkey contractor). Mitsubishi and CKD Tatra (Czech rolling stock) had major sub-contracts.

Problem	
Government processing the concession	The concession was pre the BOT Law's Implementing Rules and Regulations that led to delay.
Squatter relocation	This was on the critical path and caused minor delay. .
Asian Economic Crisis	This was not a major problem for the concessionaire. Government guaranteed the loans and took foreign exchange and commercial risk. The prospects for property gain were down-graded.
Station locations	Stations were located as the project was implemented under the design/ construct contract. These did not always match need.
Integration	No effective integration with the bus/ jeepney system, LRT1 and MRT 2 (under construction) was planned. This was not a problem for MRTC (who took no revenue risk).

Operational Problems - Today MRT3 carries 375,000 passengers per day at fares close to those of the air-conditioned buses with which it competes. It is congested for substantial periods. Extra capacity is required (maybe in combination with higher fares), but there is little prospect of this for the foreseeable future.

In December 2003 there was a major bomb incident on LRT1, and security has become an issue for the entire MRT system. There have been two major equipment -related incidents on MRT3 that are said to have been remedied.

Operations are a government role, for which a new organisation has been established. This is split from maintenance (an MRTC responsibility), that may be a less than ideal arrangement.

Success Achieved - MRT3 is in many ways a considerable success. With LRT1 and (soon to be completed) MRT2 a substantial MRT network will exist, providing a core to Manila's future development. It was implemented efficiently (at close to the estimated cost). It operates well and today carries an average 375,000 passengers/ day (albeit less than forecast for opening). There is a prospective problem brought about by Government's inability to pay MRTC who in turn are not carrying out the necessary maintenance of the system. This problem arises from Government's unexpected revenue shortfall arising from lower than forecast revenues. Increasingly there are signs that property developers wish to link into MRT3.

Winners and Losers - Manila's residents who ride MRT3 and benefit from it, together with the concessionaire MRTC, its contractors and (probably) its bankers are the main winners. Government (i.e. tax payers) appear to be the sole loser.

B.10

Manila Rail System Technical Integration

JICA funded a major Study on Standardisation for Integrated Rail Network of Metro Manila that reported in 2001²⁴. This considered the benefits of a fully rational approach to rail integration (MRT and commuter rail) in Manila drawing upon the extensive Japanese experience. It considered the following aspects of integration: technical standards, fares and ticketing, passenger service, through operations between different lines (extending/ joining them), multi-modal station plaza and plaza development/ design standards, bus/ jeepney rerouting to stations. A summary assessment of the main costs and benefits was prepared, and recommendations made for a major, comprehensive future project to implement the study recommendations.

The need for integration is often obvious and the study sets out many initiatives that would improve the situation and would be expected to be justified. Indeed there have been such proposals in Manila periodically for close to twenty years. The core problem has always been government's ability to deliver what are usually complex changes, faced with its resource constraints and other priorities. At root there is an assumption that an effective planning system can be made to exist, and that a rational planning approach will then be effective. As noted MRT systems elsewhere do often not develop in this way – although it might often be desirable if they did. Instead circumstances, personalities, policies and politics all change, windows of opportunity develop and actions are taken as and when they can be.

We note that there appears to have been no follow up to this 2001 study, and that may point to this core problem. It may be that the best way forward to effecting improvement is by a combination of 1] focusing on those aspects of integration that are important and cannot be retro-fitted and focusing on these, and 2] making government politicians/ technocrats aware of their benefits – by information (such as this SIRONMM Study) and by visiting examples of successful integration.

B.11

Jabotabek Rail System, Indonesia

JBIC instanced the problems experienced by the Jabotabek rail system in greater Jakarta. This is a public sector suburban rail system on which is superimposed intercity passenger and freight services. We have sought to understand the underlying issues, and to draw conclusions relevant to this paper.

The Problems - Indonesia's rail system has, despite attempts at improvement, been in decline since the 1970's, mainly due to the inability of government to meet the cost of maintaining the system. There has been a concerted effort over this period by many different ODA-financed initiatives to rehabilitate the system to

²⁴ Study on Standardisation for Integrated Rail Network of Metro Manila – Final report by JARTS/PCI for JICA, March 2001

provide intercity transport and an urban transport system for the Jakarta Metropolitan Area (Jabotabek) which in 2000 had a population reported to exceed 20million.

This endeavour has in substantial part failed, as electrical and mechanical systems have been procured to varying specification and supplied by numerous overseas suppliers, providing different types of equipment, maintenance regimes and in many cases different spares supplied at great cost only from foreign suppliers. The equipment is thus difficult to maintain and may cause operational problems. Furthermore, given that the rail staff are poorly paid and often without the necessary skill levels, the array of different equipment does not lead to better maintenance - but to poorer maintenance; and the cost and lead times for foreign spares in many cases leads to no maintenance at all. Corrupt business practices may play a part in exacerbating these technical/ human resource problems.

The technical problems are understood to include the following:

- There are two types of electric trains with different rheostatic controlled stock and a further 2 different types of traction equipment, all foreign and all rapidly running into a state of disrepair for a lack of spares.
- Electrification is a problem. Two lines use 1800v DC trolley wire while the remainder is 1500v DC, although on a variety of different systems which need different components and maintenance regimes. This means that not only is maintenance a problem, but the operation of trains on the two systems is problematic
- In Jabotabek alone there are different types of solid state signal interlocking equipment as well as electro-mechanical and purely mechanical systems. Only two of these systems easily interface
- There are several types of rail, but this may not present a barrier to inter-operation
- The current radio system in operation is on a frequency that interferes with the cellular telephone system that accordingly has to be modified. A major communications centre in Manggarai was destroyed by a massive lightning strike in March 2000, and by 2003 there were just 10-20% of the originally installed circuits working between Manggarai and Bogor
- There are serious safety issues. The majority of the signalling equipment in the Jabotabek area does not have adequate lightning protection, so there is an unacceptable rate of failure of equipment due to lightning strikes, resulting in some safety equipment being permanently out of service
- Theft and vandalism contribute to problems with the signalling system. There are actual safety-of-line issues that would not be acceptable elsewhere.
- All new systems were contracted in English and manuals were delivered in English by the suppliers. Some have never been translated and many project engineers who need them are unable to understand them.

Issues and Implications - The cumulative impact of these problems is extreme, and the integrity of the railway as an efficient carrier of people and freight is seriously undermined. The source of this multiplicity of problems appears to be inadequate domestic finance to maintain and rehabilitate the railway. As a result all financing is ODA sourced from a proliferation of sources, each driven by their own commercial imperatives. What the railway receives is the output of this process – something that clearly is not always in its best interests.

There is understood to have been a top to bottom reorganisation and restructuring of the old Perumka organisation for commercialisation, with the Operator a separate government-owned commercial entity from the Infrastructure Company, with PSO arrangements contracted in advance. We do not fully know the status of this change.

The problems described here do not however by-and-large occur on newly developed urban transit systems. Halcrow Fox (1990) *op cit* found that only one system failed to operate well (Rio de Janeiro because of intermittent finance). Of the concessions studied here all operated well, although there could be future maintenance problems with one (Manila MRT3 also because of financing problems). No significant problems of technical interfaces have been identified other than those concerning ticketing integration²⁵. It thus appears that the Jabotabek experience mainly concerns existing rail systems in situations where there is inadequate financing for maintenance.

²⁵ See previous section report on the JICA 'Study of the Standardisation for Integrated Railway Network of Metro Manila (SIRNMM)

Annex C Key Issues in the Cities

This Annex first provides a commentary on the comparator cities, then summarises the key issues in both case study and comparator cities.

C.1

London

Background

London is a developed 'world' city with an extensive rail system. This comprises a regional rail system of 3,640 kms. in length, a 408 km metro network (London Underground) and two, recently constructed, light rail systems collectively carrying almost 5 million passengers/day. London's buses additionally carry 5million passengers/ day. Most of the regional rail and metro networks were constructed in the 19th century and in need of extensive modernisation and renewal. London also has an extensive bus system which is almost entirely operated by private companies.

The metro, light rail and buses are the responsibility of Transport for London (TfL) which is appointed by the elected mayor of Greater London. Regional rail is overseen by the Strategic Rail Authority (SRA) which is appointed by, and answerable to the national Secretary of State for Transport (SoS). Although London has an elected mayor and assembly, the strong centralisation of government in the UK means that the discretion of metropolitan governance is quite limited with authorisation of powers and expenditure for major projects (and associated conditions) in the hands of central government.

The planning of public transport in London takes place in the context of a balanced transport strategy which includes intensive traffic management and very limited road construction with parking a well established tool of road traffic demand management. This involves restrictions over the provision on new parking space and charging for on street parking in inner London and in and around the main suburban centres. These charges produce substantial surpluses in some inner London boroughs and these are deployed to help fund local transport expenditure on traffic management and concessionary fares.

Whilst the regional rail services are funded as part of the national network there is a specific funding regime for buses, metro (Underground) and light rail through TfL's budget. This includes local property taxes, central government grants and revenues from the services it operates. These revenues include public transport fares receipts and monies from the central London congestion charging scheme introduced in 2003.

For the buses in the current year costs are forecast to be £1.3bn compared with an income of £0.85bn. This deficit of £0.45bn has grown from a few millions five years ago as a result of service improvements and fares reduction. The Underground earns £1.3bn in fares receipts but the funding required for its PPP/PFI programmes (see below) is £1.14bn in excess of operating surpluses.

Congestion charging produces a healthy financial surplus (of about one-third) with a gross income of £192m and it is proposed to extend the charging zone in the near future.

The history of public transport of London was the progressive transfer of operations from private companies into public corporations with virtually all scheduled operations under public control and patronage by the end of the second world war. This changed in the 1980s initially with the competitive contracting of bus services from private operators leading, in the 1990s, to the complete privatisation of bus operations in London. However this was within a service, performance and fares scheme specified by London Transport (LT - predecessor to TfL) and this performed significantly better than the deregulated regimes outside London in improving services and increasing ridership whereas these worsened in the rest of the country.

Private sector involvement in London's railways (other than conventional contracting) does not follow a simple model but takes several forms which reflect both the differing circumstance of the various components of the London rail network and changing attitudes on how the private sector should be engaged - informed, at least in part, by experience early public private partnerships. All the schemes for the involvement of private enterprise in London's railways have been cast within a coordinated planning, service and fares regimes.

Croydon Tramlink

This new suburban light rail system operates over previously lightly used railway rights of way, new segregated tracks and on streets in the inner area of Croydon which is a major town centre in southern London. It extends over 28kms with three arms and serves as a feeder to the busy East Croydon commuter rail station, as local links into this thriving sub regional centre and as a cross town distributor.

The basic route and form of Tramlink resulted from a careful review of the possibilities for light rail in London and emerged as the front runner in not only serving three transport functions and making use of lightly used rail tracks but by bolstering access to a large suburban town centre helped stimulate its reinvigoration in the face of growing pressure for out of town commercial and retail developments.

The technical quality of the planning was coupled with (bi-partisan) political commitment from the local borough which was concerned about central Croydon losing its dominance as the main sub-regional centre in south London, so providing the key ingredients of a successful scheme. However getting government consent to go ahead with the scheme was a long and difficult process and the eventual go ahead to promote the scheme was conditional on its being taken forward as a private sector project.

To this end private sector partners (a consortium of a civil engineering company, a vehicle manufacturer and an operator) was chosen to work with LT in a Project Development Group (PDG). The scheme that resulted from this joint working was then put out to competitive bidding. The bids were assessed on the lowest

capital subsidy required to construct the system on the basis of no on-going revenue support and operation within the LT integrated fares and service regime.

The private sector members of the PDG were not the successful bidders (but were compensated for their participation costs) and the system was opened in May 2000 and £125m of the total capital cost of £200m was funded by grant from LT. In 2003/04 it carried almost 20m passengers (up from 16m in its first year) – at 700k journeys per route kilometre 50% higher than any other comparable light rail system in the UK. The revenues however are lower than expected by the concessionaire who is carrying the revenue risk and the financing arrangements have had to be restructured.

Docklands Light Railway (DLR)

The DLR was conceived as a new high profile light rail system to open up access to London's former Docklands (20 km² in area) which were earmarked for regeneration as a mixed commercial/residential area. Use of disused rail rights of way meant that the initial 12km railway could be fully segregated and proposals for a contract at a fixed cost of £77m were invited and a design and build contract awarded in August 1984. This form of contract significantly limited the scope for client variations and this resulted in some undesirable features (e.g. noisy steel structures). However the completion of an automated light railway in August 1987, on time and to budget, provided clear evidence of a public commitment to the renewal of the area.

This resulted in an acceleration of development and extensions and up-gradings of the DLR became necessary. A westerly extension into the City's financial centre was part funded by the major private developer in Docklands and an easterly extension into a lightly developed residential zone built by conventional contracting. It was in the 1990s that the bold decision was taken to extend it across the river Thames to Lewisham bringing it up to its present length of 27 kms. and turn over the operation of the entire system to a private concession.

This involved awarding a design and build concession for the infrastructure of the 4km (£200m) cross river extension and awarding, in 1997 a 7 year operating concession to the SERCO group (subsequently extended to run 'till 2006) which, for a fixed fee, transferred the revenue risk to the concessionaire. Today the DLR carries 165k passengers/day. A further extension to serve an inner city business airport has recently been approved and is expected to be completed by March 2006.

The DLR has provided a test bed for a range of types of private sector involvement in urban rail development.

London Underground

The private sector is involved in the development of the London Underground in two principal ways (apart from developer contributions to station schemes and line extensions). These are through PFI (Private Finance Initiatives) and PPP (Public Private Partnerships).

A typical example of the former is rolling stock leasing. The £1/2bn's worth of new cars required for its Northern Line was procured from GEC Alstom through a 20 year PFI concession. This involved the concessionaire taking over the two depots, funding, constructing, commissioning and maintaining the new trains and providing these for London Underground Limited (LUL) to operate. LUL pays the concessionaire on the basis of train availability and performance. This was designed to avoid a large hump in LUL's investment programme and to ensure that the trains design, construction and maintenance were optimised. The former was certainly achieved but late delivery and lower reliability than desired have meant that this method of procurement has not shown itself in this instance to be better than conventional means. Moreover the exhaustion of capped penalties limited LUL's ability to drive improved performance from the concessionaire. This is one of several examples which have included renewal of power supplies and communications systems: which have performed rather better.

The PPP is altogether a more adventurous venture. This licences the whole of the Underground infrastructure, which carries 3m passengers/day, in three parts, to private infrastructure (including rolling stock) companies to maintain and upgrade over a period on thirty years, but with prices agreed for only the first 7½ years – largely because of uncertainty about the condition of the Underground's assets. These companies are paid on the basis of availability, quality of service and degrees of improvement. The train services continue to be operated by LUL. The (net present) value of the scheme was estimated to be about £16bn and the cost of setting it up £455m.

The scheme was very controversial and imposed on TfL by the Government against its will. TfL was concerned that the PPP would be more costly than the traditional public sector approach and would lead to management complexities and safety risks with responsibilities for the system divided between four parties. There is no doubt that the scheme eventually agreed cost more to arrange, provides improvements later than originally envisaged and is likely to cost the public sector more than expected at the outset. It is too early to say whether it will provide value for money: indeed we may never know the answer to this question. What it has done however is to guarantee long-term public financing to rehabilitate the Underground, resolving the underlying problem facing the Underground under successive governments.

Regional Railways

The regional railways – London and South East (LSE) carry 2.2m passengers/day and are operated as part of the national railway system, which was privatised in 1996. This divided the railways into:

- An infrastructure company (Railtrack – now Network Rail)
- 25 Passenger train operating companies (TOCs)
- A freight rail company
- Three rolling stock leasing companies (ROSCOs)

The TOCs operated under concessions from the Office of Passenger Rail Franchises (OPRAF) – now the Strategic rail Authority (SRA) and the

relationships between the parties (e.g. in competition for track capacity and track access charges by Network Rail) are overseen by a Rail Regulator. Safety regulation was the responsibility of the Health and safety Inspectorate.

This arrangement was arrived at after consideration of a number of alternatives and was designed, amongst other things, to secure a substantial level of competition including ‘over the tracks’ competition. In practice this latter form of competition has not materialised to any significant extent. These new arrangements have not been without their problems which saw Railtrack put into administration, a number of serious rail crashes and the replacement of OPRAF by the SRA now to be wound up and its functions taken over by the SoS.

Over this period LSE rail use has grown by 40% and fares fallen by 10%; and nationally rail investment has increased almost fourfold. However government financial support for the industry has increased six fold but support for the LSE network is much lower than the national average. Given the large increase in public funding that rail privatisation has brought – which is contrary to what many observers expected in the mid 1990s – it is difficult to say what British Railways (the former public sector operator) might have achieved with this money. So attributing clear impacts from privatisation is difficult. Also changes in the privatised railway regime mean that it has yet to settle down properly.

Conclusions

London has extensive recent experience of involving the private sector in rail development and modernisation in the context of a coordinated transport regime. However its circumstances differ from those in developing and transitional cities, not the least in its highly developed institutional arrangements, so care must be taken in applying the results of experience from London in other cities.

C.2

Hong Kong

Context

Hong Kong is a city-state with a large existing population of 7 million people living in a land area of 1099 square kilometres, concentrated in very dense corridors (only 17% of the land area is built-up) making 11 million trips/ day. 90% of travel is by public transport. There are about 275 licensed vehicles per kilometre of road, and the topography makes it very difficult to provide additional road capacity in the built-up areas.

It is governed by a single tier of Government that has traditionally been strongly technocratic, but is responding to democratisation with some politicisation of formerly technical decision-making.

The city structure is the result of major investment in integrated land use/ transport planning within a free-market culture, regulated within the firm rule of law, and the purposeful implementation of strategy. Transport is central to government policy. An extensive highways programme has been developed that is effectively managed. Rail has increasingly been seen as the ‘backbone’ of the transport system. Strong controls over car ownership and use (parking) have been implemented, and public transport is based on 2 major bus operators (Kowloon

Motor Bus Company with about 4400 mainly double-deck buses and Citybus Limited with 950 buses), 2 rail corporations (Mass Transit Railways Corporation - MTRC with 88 route-kms of heavy metro) and Kowloon Canton Railway Corporation – KCRC) together with 4000+ public light buses (PLB's), taxis and ferries.

Transport strategy has been developed through successive comprehensive transport studies (CTS) and rail development strategies (RDS), both focused on infrastructure.

Key Issues

1. Hong Kong has had a property-financed funding model for its metro development that has required no public subsidy to date; but that model has now run its course. This is the result of the best routes having been developed, a property market crash and dissatisfaction by major developers with the ever-growing role in property development by the rail corporations. Hong Kong probably has the most propitious circumstances for rail viability anywhere, and MTRC is one of the leading operators worldwide, yet it is not profitable without its property operations. It therefore seems unlikely that any metro is likely to be financially viable on a stand alone basis anywhere.
2. Hong Kong demonstrates the importance of good operators. MTRC is recognised as a world leader in operating effectiveness. The two corporations finance, develop, implement and operate MRT projects that government wishes to go ahead. Their scope is similar to that of some MRT concessionaires. The HK experience shows that good operators require
 - The rule of law to firmly apply
 - The MRT organisation to be established by ordinance/ statute/ contract, defining *inter alia*: fares determination and adjustment, how it will be regulated, rights to extensions, prudent financial requirements for investments, government step-in rights, and the organisation to be staffed meritocratically, with decision-making delegated.
3. HK demonstrates that there are benefits of effective development/ transport planning. Essential in a populous city-state, HK has applied effective planning as central to its policy. The purpose of planning has been to allow government to make informed decisions. Government has historically put much effort into planning, to ensure that this meets its objectives. This has resulted in planned, integrated infrastructure and efficient, dense development. Sometimes the achievement has been extraordinarily impressive.
4. There are benefits in an efficient MRT project development process. This follows from an effective planning system. The HK government has developed an efficient project development process, continually building upon its experience. This comprises a small number of tasks and decisions, carried out usually efficiently, and resulting in implementation (always) and (usually) success.

5. Large benefits can result from government developing an institution-focused MRT investment programme. When an efficient corporation (like MTRC or KCRC) is required to carry out a sustained programme of investments, it becomes much more efficient. Securing these benefits requires government to take a strategic view that over the next substantial period there will be a continuous programme of network development. Because the emphasis is on much more efficient, the resulting cost is much lower; and this means that such projects are much easier to justify. A virtuous circle is created to the stage when the limits of efficiency are reached.
6. The 2-operator model that has been successful to date is now being changed. It came about because KCRC ran inter-urban and cross-border trains, a very different function and territory from creating Asia's first underground high-capacity metro – for which MTRC was created. Now the HK Government has decided to merge the 2 corporations on the grounds that:
 - There will be some scale economies
 - Fares will be integrated and the second boarding fare between systems removed – increasing passengers, making travel more convenient, attracting new passengers from the buses, but also reducing revenues
 - There will be benefits from planning future network additions, and avoiding the existing situation where each corporation seeks to serve its own network and keep its own passengers

This change in structure is in contrast to Singapore where government has created two multi-modal operators.

7. An effective multi-operator ticketing system has been developed. The success of the Octopus smartcard developed and operated by the MTRC is extraordinary – 11mn cards are in circulation in a city-state of 7mn people! That it currently allows each operator to keep their own revenue, but that it can be adapted to full fares integration demonstrates its power. In any city with the necessary income level (for people to be prepared to prepay for travel to this extent), Octopus may set a standard.
8. Yet everything is not successful. Road pricing, long studied has yet to be implemented and traffic congestion is often severe. Bus and rail are reportedly not competing on a level playing field, with buses paying low taxes yet rail required to fund its infrastructure. And the reliance on the property-financing model has shifted discussion from the right scale of MRT network, and it may be there has been an under-investment in rail. But against this very much has been achieved, and the success of the transport system underpins the dense, efficient city structure that is Hong Kong.

C.3

Singapore

Background

Singapore is a city state with a population of 4.2 million people on an island of 683 km². It has an average population density of 6,160 persons/ km² and only 720 kms of road per million people, but with a per capita GNP in excess of US\$20k.

It provides an excellent, perhaps unique, example of progress from a relatively poor city on its separation from Malaysia in 1965 to a well managed successful city state today. It has income levels of a similar order to those in Western Europe (following three decades of economic growth of over 8%/year), little poverty, good housing and a successful economy. Perhaps more important for this study, it has managed to achieve this whilst avoiding the severe stress on its transport system that is associated with so many developing (and developed) cities.

Whilst Singapore boasts a strong market economy, government has played a key hand in its development and continues to do so. It has produced successive plans for the development of the nation state and the services required to underpin this; and taken an active role in implementing these. These plans embrace the key aspects of development: employment, housing, education, health and welfare and transport. In key areas the state has taken the initiative to secure their implementation by, for example acquiring large tracts of land for housing and industrial development and, more recently, office space as it saw the opportunity to establish a thriving financial and business services centre

Policy on Transport

Transport has long had a special significance for Singapore being located, as it is, at the southern end of the Strait of Malacca. Consequently it has one of the busiest ports in the world and has reinforced its world transport hub status with its impressive Changi airport and Singapore Airlines which is now the fourth busiest international carrier (measured by passenger kms).

The government's attitude to transport therefore is rooted in recognition of its basic importance to the successful development of Singapore and quality of life of its citizens and a commitment to act as necessary – not to rely on initiatives by third parties- to bring about the necessary improvements.

Policies for public transport are set within a general transport policy based on limitation of car ownership and use. The Vehicle Quota Scheme and Certificate of Entitlement to purchase a new car have kept the number of cars down to around 100/1000 population – a level to be expected in countries with a quarter the income levels of Singapore. The Electronic Road Pricing system, which has been progressively developed from the original 1975 Area Licensing Scheme, keeps traffic densities on expressways and main roads to levels where vehicles normally flow freely. The other legs of this policy are the development of an excellent public transport system and a high quality road network.

Organisation of Public Transport Responsibilities

Transport is overseen by the Ministry of Transport, under which there are four statutory boards, including the Land Transport Authority and Public Transport

Council. The Land Transport Authority (LTA) was formed in 1995 bringing together four previous government agencies including the Singapore Mass Rail Transit Corporation with the objectives:

- To deliver a land transport network that is integrated, efficient, cost-effective and sustainable to meet the nation's needs.
- To plan, develop and manage Singapore's land transport system to support a quality environment while making optimal use of our transport measures and safeguarding the well-being of the travelling public.
- To develop and implement policies to encourage commuters to choose the most appropriate transportation mode.

The LTA procures most scheduled public transport services through franchises with two private companies – SMRT and SBS Transit and, through its subsidiary, EZ-Link Pte Ltd the multi-operator fare card/payment system.

This 'duo-opolistic' arrangement resulted from a restructuring of the public transport industry in Singapore in 2001, at the government's initiative, into two multi modal franchises each operating metro, light rail²⁶, buses and taxis. The two companies are SBS Transit which was formed out of the former Singapore Bus Services and SMRT Transport which was set up in 1987 to operate the first two metro lines and acquired Trans Island Buses and Singapore Shuttle Bus on its formation in its present.

The Public Transport Council (PTC) licenses public transport fares and bus services.

Transport Plans

The Rapid Transit Master Plan was set out in the 1996 White Paper - 'A World Class Land Transport System'. This proposed that by 2008 the Singapore Government would expand this to approximately 175km with the completion of the North East Line (20km), the Marina Line (34km) and the Light Rapid Transit systems in the new towns of Sengkang (10.7km) and Punggol (10.3km). In the longer term, plans exist to expand the rail system by another 3 lines in the next 10 to 15 years at a cost of S\$11 billion (US\$6.5bn).

The rapid transit system is complemented by a comprehensive bus system, operated under licence to the PTC as part of the franchising system. SBS operates a 2,500 bus network and SMRT a network of over 800 buses. This is designed to serve those sections of the market that are not provided for by the rail system and to augment in those sections where rail best provides the trunk service.

There is a similar plan for Singapore's roads. The Road Master Plan (RMP) is a strategic road plan to guide long-term road development in Singapore. Projects are awarded to civil construction contractors through open competitive tender.

²⁶ Light Rail in Singapore has to date comprised fully elevated automated people-mover systems to MRT stations, designed to increase the MRT catchment

Traditionally, the Government has funded all capital expenditure programmes in the form of advances and grants. However in 2000 the government turned to the market for the first time to successfully raise S\$300 million through a Singapore dollar bond issue and, in May 2002, a second offering of 10 year public bonds was made to raise a further S\$500 million.

Development of Rail Transport

The construction of the MRT system began as a state venture in 1983 and was opened in 1987. The next line was to Woodlands in the north of the Island, while in 2002 an extension to Changi Airport was opened. These lines are operated by SMRT under licence to the LTA which owns the assets; this licence originally ran 'till 1998 but has been extended to 2028.

The most recent line, and last of the heavy metro lines is the North East Line (NEL). This is fully underground and commenced passenger service in June 2003. Its two interchange stations at Outram Park and Dhoby Ghaut connect the NEL to the existing two lines. The NEL is operated by SBS Transit, under license to the LTA which owns the assets, as part of the two franchise regime. These two franchises are not designed to compete in the provision of service but do allow performance comparisons to be made. Construction continues with the 29 station Circle Line being built which will connect the three radial metro lines. More recently three feeder light rail systems have been opened. So - much of the 1996 rail development plan has already been completed.

The MRT system has demonstrated a high and growing level of ambition by a public authority that is unusual. This arises in part from Singapore's unusual democracy with a single-party Government that is nevertheless under constant internal and external pressure to perform. The civil service is staffed meritocratically and well-paid in return for expected performance. The first MRT system was by international standards good, efficient, and immediately successful. The major extension to Woodlands was more ambitious with a focus on integrating it better with the existing transport system; and this was achieved and again immediately successful. The latest NEL was the most ambitious project yet, that sought both excellent integration with land uses and property at stations and full automation (said to be the world's first automated heavy metro). This was substantially successful, albeit that ridership is lower than expected.

The high level of transport and land use integration exemplified by these two recent schemes can rarely be found in even the most sophisticated planning and implementation regimes and to try and achieve these with a mixture of public and private interests would be virtually impossible. Together the rail services in Singapore carry 2½m rides a day.

Conclusions

Singapore is probably unique in having such a powerful unitary government which has, in effect, been in power for four decades. The government has set progressively high standards as the state's economy has grown and is prepared to be held to account for achieving these. Moreover in making comparisons with

other cities in SE Asia it should be recognised that the combination of the success of 'government' in Singapore and a consistently rapidly growing economy means that it has had the support and means to undertake major projects on its own account. Thus while it has periodically reviewed international experience of PSP, it has not so far seen merit in applying this in the land transport sector.; however following the development of Singapore's first water desalination plant through a PPP, the government is in the process of setting up a Public Private Partnership forum to encourage long term partnering between government agencies and private sector partners to deliver services

Lessons to be drawn for Singapore's experience in developing its rail system include the following:

- Government has for 30 years had a strong, consistent policy for integrated transportation and land use. It takes planning very seriously and demonstrated its effectiveness when backed with resources and political will. It never stands still, and modifies the strategy, but within the same objectives and framework of integrated development
- Government has set clear financial requirements for the development of the MRT system, related to its core objectives²⁷. These have consistently guided its decision-making. Projects are prepared for implementation, but implemented only when 'the time is right'. This is a very sophisticated approach rarely matched.
- The rare combination of technical competence; political priority, will and capability and a strong economy have allowed Singapore to develop a comprehensive high quality public transport system with little need for private capital for rail investment.
- Franchised private sector multi-modal operations have recently been established. It is too early to assess their success following problems with one franchise (resulting from the NEL)
- Not everything has been a complete success. There is debate about the success of the LRT feeders to MRT stations. It is too early to form a judgement on the success of the fully automated NEL. There has been concern about its revenue shortfall. But these comments are made against a background of hugely impressive performance that is ever driving up standards, and in many ways sets a benchmark for other cities worldwide.

²⁷ Namely that 1) Government will fund new infrastructure from its resources and 2) incremental revenues should then fund incremental operating and asset replacement costs, i.e. there should be no further recourse to government funding

C.4

Summary Key Issues

The following Table C.1 summarises the context, key issues, impact and success in the case study and comparator cities.

TABLE C.1 KEY ISSUES IN THE CITIES

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
A CONTEXT						
City Today	9mn people in rapidly expanding congested metropolis. Middle-income	1.4mn people in a city that has transformed itself is a short time. Middle income	10mn people in a rapidly expanding megacity, with a wide disparity of incomes	A 7million population city-state, with dense corridors. High income	A planned city-state with 4.2mn population, structured along dense corridors. High income, low income disparities.	A mature world city with a population of 7.4 million; capital of the UK
Governance	<ul style="list-style-type: none"> • Institutional coordination problematic. Poor experience with PT operations/ management (SRT, BMTA) • BTS: BMA (met Gov't) sponsor • Blue Line – MRTA (new Nat'l Gov't instit'n) sponsor 	<ul style="list-style-type: none"> • Strong government led by visionary PM that created broad concept and strategy • Gov't put faith in the private sector to develop projects • All concessions under MOT • The new Government is building on this inheritance 	<ul style="list-style-type: none"> • Government institutions not strong • Met. Gov't not yet effective in this sector • Institutional coordination problematic 	<ul style="list-style-type: none"> • Governed by an authoritative meritocracy developing populist politics • A city planned with a free-market culture, regulated within the firm rule of law • Two MRT corporations required by charter to act on prudent (defined) commercial lines • Government transparent. Procurement strongly competitive 	<ul style="list-style-type: none"> • Governed by an authoritative meritocracy, under strong political pressure to perform • A city planned with a managed free-market culture • Renowned for its lack of corruption. Procurement is strongly competitive • Sound government finances 	<ul style="list-style-type: none"> • Elected mayor and Assembly • Centralised government means high dependence on national government for funding • Buses, metro and LRT under mayoral control. Commuter rail part of national network
Transport Today	Bangkok was famed for congestion. Expressway dev't + Asian economic crisis reduced this. BTS has reinforced this. BMTA (Gov't company) manages most bus operations that are heavily subsidised	Context set by subsidised private cars and fuel, and earlier poor experience with minibuses-based PT. The first concession was a foreign unsolicited proposal (STAR). PUTRA, monorail and ERL (Airport express) followed. A large electrified suburban rail system has been developed (KTM). PT system seen to be a problem with system-wide revenues barely covering costs and 16%PT mode split	A vibrant bus/ jeepney industry – regulation problematic. LRT Line 1 a success since 1985 (until recently). Commuter rail (PNR) an ongoing problem	Transport is central to Government policy. An extensive investment in highways, effectively managed. Rail seen as the 'backbone' of the transport system. Strong controls over car ownership/ use. PT based on 2 MRT corporations, 2 private bus companies + minibuses	A strong, balanced and comprehensive transport policy is central to government's integrated land use/ transport policy. Public transport comprises an extensive MRT system carrying 2.5 mn rides/ day, integrated with bus services. Two vertically integrated multi-mode operators SMRT and SBS Transit are franchised.	Public transport coverage extensive but some major projects (e.g. Crossrail) still needed. Congestion charging in centre is to be extended into inner London. Extensive use of PSP and all public transport operations are through various form of concession.
Policies that influenced MRT	<ul style="list-style-type: none"> • Strong support for BOT policy • Widespread support for MRT dev't • Req't to underground rail infra in CBD (1995) 	<ul style="list-style-type: none"> • Promote Malaysia as high-tech society • Use infra dev't to create Malay (bumiputra) entrepreneurs • Use private sector finance to drive infra dev't • KL to remain a 'green' and liveable city • KL to decentralise into a 	<ul style="list-style-type: none"> • Mass transit has been supported widely since the 1980's, fitting a range of agendas • Strong support for BOT since 1989 • Tariffs have become increasingly politicised 	<ul style="list-style-type: none"> • The shortage of land has led to a large investment in integrated planning and transport services • Government owns all land. Until recently a property-based MRT financing model has avoided the need for any public subsidy in the development of the large 	<ul style="list-style-type: none"> • The land use plan, based on a strong CBD and dense radial corridors was determined 30 years ago • The integrated land use/ transport plan has held constant for 30 years • Extensive study concluded that Busways could not cater for forecast demand 	<ul style="list-style-type: none"> • MRT has long been part and parcel of the city fabric • MRT is central to current transport strategy • Modernisation and renewal is the key challenge but • Some new links are seen as key to regeneration and the realisation of sustaining world city role.

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
		city region stretching to the new airport		MRT system	<ul style="list-style-type: none"> Recently so-called LRT (seg'd people-mover systems) piloted to increase MRT catchment area 	
Experience of PSP	<ul style="list-style-type: none"> Thailand a leader in PSP, with early BOT activity in power, expressways, later in water/sewage Early problems with the Second Stage Expressway BOT 	<ul style="list-style-type: none"> Malaysia a leader in PSP, with early BOT activity in power, expressways. The North-South Expressway a singular success 	<ul style="list-style-type: none"> Philippines embraced PSP from late 1980's Early successes to solve the power crisis in the early 1990's Subsequently substantial expressways experience Failed MRTC BOT bids in 1989 Hiatus over Manila Airport BOT recently a problem 	<ul style="list-style-type: none"> HK the founder of private financing, and major financial centre HK embraced PSP for harbour crossings/ tunnels, with successes No use of PSP in MRT 	<ul style="list-style-type: none"> Singapore a major financial centre Singapore's sound finances and capable government have led to public sector procurement. Government has kept PSP experience elsewhere under review. The NEL operations have been let under a concession. 	<ul style="list-style-type: none"> Extensive experience of PSP in the MRT sector (as described e.g. Croydon Tramlink, DLR capacity upgrading and extensions, LU PPP rehabilitation) and increasingly in other sectors
MRT System Today	<p>44 kms. Two BOT concessions :</p> <ul style="list-style-type: none"> BTS - full BOT, elevated Blue Line (BL) - E&M eqp't BOT, underground. <p>Both state-of-the-art technologies.</p>	<p>65kms. Three different technology systems. All BOT concessions:</p> <ul style="list-style-type: none"> STAR – 27kms at-grade/ elevated LRT PUTRA – 29kms automated 'Skytrain', elevated/ u'gd in CBD 9kms monorail (Malaysian technology) <p>+150km electrified suburban rail system</p> <p>The STAR and PURA concessions were taken back into a public asset corporation (SPNB) after financial failure</p>	<p>46 Kms. Three lines:</p> <ul style="list-style-type: none"> Line 1 open end 1984 – 15kms elevated Belgian LRT cars MRT3 – 17kms at-grade/ elevated, Czech streetcars. Opened mid 2000 - BLT concession MRT2 – 14kms elevated modern metro JBIC financed. All but one station open mid 2004, final station late 2004 All under public operation except MRT3 maintenance (part of BLT concession) 	<ul style="list-style-type: none"> Comprises two systems under two corporations: MTRC (part privatised) and KCRC (wholly government owned) + ferries, PLB's etc MTRC – 84 kms (5 lines, 65% underground) + Airport Express (35kms) = 119 kms operational KCRC – East Rail – 34 kms, LRT (T'suen Mun) – 36 kms, West Rail – 31 kms = 101kms operational 	<ul style="list-style-type: none"> Phase 1 comprising 67kms was open 1990. Underground in centre, elevated elsewhere Woodlands Extension 16kms opened 1996 – Elevated Bukit Panjang LRT 8kms open 1998 Changi Airport 6km extension open 2001 North East Line (NEL) 20kms along the last heavy metro corridor opened 2003 with Sengkang LRT 11kms About 1998 – 2 multi-modal operators created. SBS Transit operate NEL, SMRT the remainder 	<ul style="list-style-type: none"> Underground 408kms DLR 27 kms Croydon Tramlink 28 kms plus 3,640 km regional rail system (NSE) <p>Both the Underground and regional rail span obsolete to SOTAT technologies. Both light rail systems are modern and DLR is automated.</p> <p>These together carry 5 million passengers per average weekday and are used by 78% of central area commuters.</p>
Regulation	BTS contract regulated by BMA BL contract regulated by MRTA	Concessions and SPNB regulated by MOT	All lines by DOTC.	Corporations regulated by Transport Branch	LTA is the economic and safety regulator.	Metro and Light rail controlled by TfL under the mayor. Regional rail controlled by SRA under central government. There are rail/safety regulators
Future MRT Proposals	<p>Commitment to major network expansion: +247km in 6 yrs (291kms total). Of this:</p> <ul style="list-style-type: none"> MRTA 91kms BTS ext 48kms SRT 115 kms 	The immediate concern is to implement the restructuring and integration strategy (below). Thereafter there are several proposals for new projects.	A large number of projects proposed by various groups	<ul style="list-style-type: none"> Major proposals planned The proposed merger of the corporations + requirement for public financing give some cause for review 	<ul style="list-style-type: none"> The Punggol LRT, Marina Line and Circle Line are under construction A large network expansion is planned 	<p>Links to new Heathrow T5</p> <p>DLR extension to the City Airport</p> <p>Thameslink 2000</p> <p>CrossRail</p> <p>East London Line extension</p> <p>NE/SW Metro in longer term</p> <p>Total cost circa £20bn.</p>

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
B KEY ISSUES						
<i>Stakeholder Motivations and Attitudes</i>	<ul style="list-style-type: none"> Since the 1979 German MRT study, there has been support for MRT. This has rapidly increased. It is now top of the political agenda Tanayong (BTSC) and CH Karnchang (BMCL) both have a strategic long-term commitment to MRT Government has proved ineffective in supporting transport concessions 	<ul style="list-style-type: none"> Since STAR was proposed by a private group, there has been a rapid and sustained support for MRT by most stakeholders Government has been a strong and consistent supporter of PSP and the dev't of bumiputra entrepreneurs Many private sector players have exhibited a 'can-do' attitude 	<ul style="list-style-type: none"> Since the late 1970's there has been a consistent and strong support for LRT/MRT, although little consistency in government's ability to effect imp'n. Government's focus has been on BOT projects to attract financing Manila's 'families' are influential in determining what happens 	<ul style="list-style-type: none"> Since the 1970's there has been a consistent consensus behind MRT, LRT and suburban rail Over this period HK a major Regional financial centre and private finance leader Government has become less technocratic, but is effective, and supports major project dev't 	<ul style="list-style-type: none"> Following the decision to implement MRT, there has been a long-term consistent consensus behind MRT as central to the city-state's development strategy Government technocrats act strongly in the public interest There is a strong, competitive contracting industry. 	<p>Need to upgrade existing systems and selective extensions are the subject of consensus. No agreement on how to fund extensions</p>
<i>MRT Finances and Public Affordability</i>	<ul style="list-style-type: none"> Affordability little mentioned BTS: financial crisis > debts being restructured (agreement with creditors, not yet shareholders). Then IPO planned. Small gov't investment needed to make BTSC strong for listing BL: too early to tell (open July 04) 	<ul style="list-style-type: none"> All project expected to be profitable so no issue of public affordability Today system-wide revenues hardly cover operating costs STAR/PUTRA concessions failed, assets in public corporation Monorail/ERL concessions operational (early days) Affordability now a major issue 	<ul style="list-style-type: none"> There is a crisis in the public finances, that may drive changes in the policy agenda The politicisation of fares (in particular) has worsened LRTA finances The MRT3 concession requires unexpectedly large public financing Yet there are many proposals for new projects requiring major public financing 	<ul style="list-style-type: none"> The Corporations have fares autonomy under their charters Until recently no public subsidy was required in rail operations The change in the property market, two poorly performing projects + the less attractive opportunities now existing have led to government finance becoming necessary MTRC revenues exceed operating costs by 110% (60% on basis of farebox alone) KCRC had a similar performance (120% in 2003) pre-West Rail 	<ul style="list-style-type: none"> Government finances are sound, and based on managing for the long term Government funds the initial capital cost from its resources Government requires MRT projects to fund incremental operating costs and asset replacement costs from incremental farebox and ancillary revenues 	<ul style="list-style-type: none"> MRT operating surpluses are insufficient to fund the cost of modernisation and renewals through the PPP. Any new projects will require external funding of one form or another. Proposals for a new 'beneficiary' tax are being discussed but as yet nothing has been agreed.
<i>Structure of Government, Government Effectiveness</i>	<ul style="list-style-type: none"> Transport institutions have just been restructured. All MRT now under MOT (MRTA/SRT) except BTS Proposed separation of Authority (procurement/policy/ownership of assets/ regulation) and Operations (at fares 	<p>Major restructuring strategy (INSPAK) based on following:</p> <ul style="list-style-type: none"> A new Urban Transport Authority to be established under the PM's Office An asset-owning company SPNB (PUTRA, STAR, Intrakota, Park May) – who would contract: OpCo operating all services 	No change planned	<ul style="list-style-type: none"> The merger of the 2 corporations is planned to integrate their networks/ services and lead to better future provision 	<ul style="list-style-type: none"> City-state with one tier of government for strategic project development LTA responsible for all land transport Government recognised for its efficiency. There is constant upward pressure to perform, internally and from the public 	<p>The role of the Mayor in oversight of regional railways is an issue and central government is to take a more direct hand in control of the national railways.</p>

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
	determined by Gov't)	and taking full commercial risk				
Government Support to Concession Project	Government has not always provided effective support to MRT concessions	Government has not always provided effective support to MRT concessions	Government has not always provided effective support to the MRT concession	Government provides effective support to all project development.	Government provides strong, effective and pragmatic support to all project development.	<ul style="list-style-type: none"> Strong support of all concessions (subject to the terms of the concession) after award. Local traffic management and bus service reorganisation in the case of Croydon Tramlink.
Policy re Ownership/ Operations	<p>The Gov't propose to separate ownership & operations, leads to:</p> <ul style="list-style-type: none"> Proposal to buy back both concessions (then let an operating concession) – at a public cost of US\$2bn(?) [Focus is BTS, centrepiece of the network + Gov't owns 0% c.f. 80% of Blue Line] Focus on Operating (not BOT) concessions > less role for private financing 	Gov't to take over the system and tackle the problems <i>pro tem</i> . Policy to be separated from ownership from operations creating new organisations. A single operating company to be created for PT, contracted to an asset owning company under a performance-based contract. Concessions operating satisfactorily to continue	<ul style="list-style-type: none"> The BOT approach is being overhauled to make it more effective Otherwise this is not an issue 	The two corporations are to be merged into a single part-privatised entity .	Government funds and owns all assets. Operations are franchised to private multi-mode operators	<ul style="list-style-type: none"> Ownership of the Underground is retained in the public sector but licensed to infrastructure companies. Operations are in the public sector. Both DLR and Tramlink operations are private but with the ownership of DLR part public and part private concession
Project Dev't Process	<ul style="list-style-type: none"> BTS: Major change to original project to a feasible depot site. Otherwise dev'd effectively in the face of many problems BL: 2 strong bids. Major delay: mismatch in timing between ODA -financed civil eng'g & BOT concession Both concession contracts obtained Is there a process? 	<ul style="list-style-type: none"> Projects generally awarded to favoured groups for development and operations Strong pressure exerted for delivery Government pragmatic in its support No concession contracts available for review Is there a process? 	<ul style="list-style-type: none"> There is a formal infra and separate BOT process. Relocation process does apply, maybe thwarting anything happening It could be much more rigorous and transparent MRT3 was developed effectively led by an entrepreneur MRT2 was developed less effectively MRT3 concession contract obtained Civil involvement a problem: knowledge is followed overnight by squatters seeking rehousing. Pvt sector left to deal with this 	<ul style="list-style-type: none"> There is a well-developed, efficient project development process Gov't invites one Corporation to develop the project (in one recent case they competed directly). The Corporation takes the major role thereafter 	<ul style="list-style-type: none"> There is a sophisticated process. Projects are developed to the stage they could be tendered, and then held for decision 'when the time is right' For NEL this led to an 8-year delay 	<ul style="list-style-type: none"> There is a clear process for the securing of powers and financial authorities for project implementation The actual implementation may involve private sector finance in a variety of ways and the process will be adapted to suit the circumstances of individual projects. The current DLR extension is a concession with the costs met by the private sector rewarded by availability payments once the line is open – a copy of the Lewisham Extension scheme.
Role of the	<ul style="list-style-type: none"> BTS: dominant in project dev't from concept stage 	<ul style="list-style-type: none"> STAR – unsolicited private sector scheme 	<ul style="list-style-type: none"> Projects are either Proposals for ODA 	<ul style="list-style-type: none"> The history is of 2 Gov't corporations and a 	<ul style="list-style-type: none"> Operations of public transport (SMRT and SBS 	<ul style="list-style-type: none"> Private sector proposals for developing a variant of Crossrail

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
<i>Private Sector</i>	<ul style="list-style-type: none"> • BL: implemented a Gov't defined project 	<ul style="list-style-type: none"> • PUTRA/ERL – public sector concept, dev'd by private sector • Monorail – private sector proposal linked to 'linear city' development • KTM electrified suburban network – developed by public sector 	<p>financing – gov't identifies projects; or</p> <ul style="list-style-type: none"> • Proposals for JV's with gov't corporations or unsolicited bids under the BOT Law – private sector leads project identification • One success to date: MRT3 	<p>property-financing model that has produced high levels of service at no public cost.</p> <ul style="list-style-type: none"> • MTRC was part privatised in 2000 • Issue of private concessions has not arisen 	Transit)	have been put forward but doubts about viability mean that they do not seem likely to be accepted.
<i>Planning</i>	<ul style="list-style-type: none"> • Transport strategy unconstrained by financing constraints – a 'wish-list' of projects • BTS – metropolitan gov't defined the concept • BL – central gov't identified the project 	<ul style="list-style-type: none"> • Government sets a broad development/ transport concept and strategy • Identified project developed by private sector • System responsive to unsolicited proposals 	<ul style="list-style-type: none"> • There is no effective planning – no meaningful strategy (a 'wish-list' of projects) • Gov't responds to bids by various groups for ODA or PPP financing • There is no sound basis for judging value-for-money 	<ul style="list-style-type: none"> • Government puts a major investment into planning, through Comprehensive Transport Studies (CTS) and Rail Development Studies (RDS) • There is therefore a meaningful transport strategy • Government identifies in considerable detail what it wants 	<ul style="list-style-type: none"> • Government puts a major investment into integrated land use transport planning. • It has a sophisticated transport strategy, developed with substantial resources and kept under constant review • Government undertakes all planning 	<ul style="list-style-type: none"> • Transport plans are part of the Mayor's London Plan. • The public sector takes the lead in project identification and prioritisation
<i>Technology</i>	<ul style="list-style-type: none"> • BTS and BL are 'first-world' metros 	<ul style="list-style-type: none"> • STAR is a segregated LRT • PUTRA is said to be the world's longest automated transit (like Vancouver Skytrain). SPNB have the capability to manufacture extra cars • Monorail is Malaysian manufactured, based on Seattle ALWEG 	<ul style="list-style-type: none"> • MRT3 is a segregated LRT, using Czech streetcars 	<ul style="list-style-type: none"> • MTRC operates a 'first-world' metro • KCRC operates street-running modern LRT, state-of-the-art West Rail, electrified intercity passenger and freight services 	<ul style="list-style-type: none"> • First-world modern metro • NEL said to be the first automated heavy metro • Elevated automated people-mover systems (LRT) • Smartcard ticketing system 	<ul style="list-style-type: none"> • London Underground comprises different lines and bespoke technologies, all metro • Croydon Tramlink is a modern LRT street-running system • Docklands Light Railway has been progressively upgraded and is fully segregated
<i>Integration</i>	A major issue, and gov't argument for buy-back into public ownership. BTSC already decided to introduce smartcard ticketing (integrated ticketing straightforward)	A major issue, and reason for the major restructuring of the PT sector	A major issue – there is no effective integration.	Integration a major reason for the merger of the corporations.	<ul style="list-style-type: none"> • Government has always put major effort into integration • This has progressively become more sophisticated • Today Singapore's PT system is an exemplar of integration with development and the existing PT system 	Despite many awkward interchanges a good degree of integration has been achieved. Fares integration has shown itself to be a commercial success and to increase the use of public transport.
<i>Procurement</i>	<ul style="list-style-type: none"> • BTS: original concept bid, BOT project changed completely • BTSC developed the 	<ul style="list-style-type: none"> • Concessions often granted without strong competition, under strong pressure to deliver 	<ul style="list-style-type: none"> • MRT3 – unsolicited bid before BOT Law operationalised • MRT3 an example of the 	<ul style="list-style-type: none"> • Gov't has usually invited one Corporation to develop the project. They determine the property requirement to 	<ul style="list-style-type: none"> • Government has had a strong hand in procurement • NEL concession was let on the basis of financial 	<ul style="list-style-type: none"> • Procurement has been by a variety of means from conventional contracting through to a variety of

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
	<p>project properly</p> <ul style="list-style-type: none"> • BL: civil eng'g – JBIC loan. 4 packages competitively bid • BOT eqp't concession: competitively bid • Neither project had a significant performance spec • Little use made of the concession contract • Gov't buy-back covered, with compensation incl. future profits foregone • BL contract includes revenue-sharing with MRTA 	<ul style="list-style-type: none"> • Government has been pragmatic in resolving problems • When unsuccessful there have been adverse consequences, usually for investors • Monorail concessionaire takes full commercial risk • All concessions 60 years except 70 for Monorail – gov't has no interest in MRT operations • STAR an example of the pvt sector if left providing cheap equipment 	<p>private sector providing cheap equipment of left</p> <ul style="list-style-type: none"> • MRT2 – ODA financed through JBIC. 4 contract packages competitively bid 	<p>be compatible with their mandate</p> <ul style="list-style-type: none"> • This is agreed with Government • They then implement and operate the project 	<p>strength and service quality proposed</p>	<p>concessions.</p> <ul style="list-style-type: none"> • In all cases procurement has been through competition which is now required by European law.
Financing	<ul style="list-style-type: none"> • BTS: led by major Thai property developer • Structured by IFC • Debt from foreign (mainly – resilient in the face of Gov't pressure) and local banks (will do what they are told) • BMCL – debt + equity 100% Thai 	<ul style="list-style-type: none"> • Equity mostly local (STAR a significant foreign equity) • Debt local • Government soft loans for all concessions 	<ul style="list-style-type: none"> • NEDA require 25-30% equity • MRT3 concessionaire led by major Filipino developers • Debt from Foreign (mainly) and local banks • MRT2 crippled by peso depreciation (Yen loans) • Typically 50% eqp't for which 90% financed by suppliers' credit widely available + 50% civil works financed by IFI's 	<p>Projects are financed from a combination of internal revenue-generation , property income (capital uplift in value + rentals), and debt. The corporations have excellent credit ratings and raise debt on the market</p>	<p>Government funds all infrastructure</p>	<ul style="list-style-type: none"> • Financing has been by a variety of means from conventional grant funding to the award on concessions. • Where concessions have been let the general approach has been either to seek minimum grant for no operating grant, or minimum operating grant required for full capital cost funding by the concessionaire.
MRT Institutions Created	<ul style="list-style-type: none"> • BTS concessionaire (BTSC) very effective • BL concessionaire (BMCL) already effective. 	<ul style="list-style-type: none"> • STAR and PUTRA operations have been merged under SPNB as a single operator • Monorail and ERL operations are separate 	<ul style="list-style-type: none"> • MRTC (concession company) has completed construction task • Maintenance by MRTC (Sumitomo sub-contract) threatened by gov't inability to pay • DOTC operate • No new sustainable institutions created 	<ul style="list-style-type: none"> • MTRC has a deserved reputation as maybe <u>the</u> leading MRT institution worldwide • It is branching overseas, and expects to sign 2 major deals – for PRC's first BOT MRT project in Shenzhen and its first PPP MRT in Beijing • KCRC has a reputation for efficiency 	<ul style="list-style-type: none"> • MRTC operated the Initial System after they had implemented it. Then • SMRT was established and given a 10-yr lease (extended) • Transitlink is a public entity created to be the public marketing face of PT • About 1998 two vertically integrated private multi-mode operators were created 	<ul style="list-style-type: none"> • Transport for London was created as part of a wider reorganisation of London governance but now oversees London Underground Limited as the MRT operator and the infracos as the infrastructure managers. • DLR Ltd was formed as a subsidiary of (TfL) to oversee the development of the Docklands Light Railway and

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
<i>Operations</i>	<ul style="list-style-type: none"> BTS efficient, increasingly market-focused. New org'n BL started operations well. New org'n 	<p>All operations appear efficient.</p> <ul style="list-style-type: none"> PUTRA/Star – loss-making feeder buses STAR – new org'n, maintenance problems, marketing? PUTRA new org'n. Ops and maint. Efficient Monorail – new org'n ERL – new org'n 	<ul style="list-style-type: none"> LRT1: operations problematic in recent years. Maintenance subcontracted to MTERO – but not parts! MRT3: no strategy. New org'n for ops. Maint. Party of concession. 2 major incidents/ disruptions MRT2: no strategy. New org'n for O&M. Operations recently commenced satisfactorily 	<p>Operations planned from the start</p> <p>Both operations highly efficient (benchmarked against leading metros worldwide).</p>	<p>Substantial planning for operations. These are recognised to be efficient</p>	<ul style="list-style-type: none"> TfL manages the Tramlink concession <p>Age of systems makes this difficult for LUL and NSE.</p> <ul style="list-style-type: none"> NSE thought to compare with European norms LUL mixed compared with old metro norms DLR good Tramlink good
<i>Security</i>	Not an issue	Not an issue	A major issue. Major bombing of LRT1 in Dec 03 (many deaths) + periodic political problems	MTRC have had security incidents. Much effort put into training staff to deal with them	No information to hand	A major issue not just of late but following thirty years of IRA attacks and one section of the DLR was badly damaged by a terrorist bomb.

C IMPACT AND SUCCESS

<i>Ridership (pass/aver day)</i>	<ul style="list-style-type: none"> BTS: 350K (375 weekday, 300 Sat, 240 Sun). +18,5% in last year BL: 120K P&R 80% full on opening fares <p>Bangkok Total Rail <u>470K</u></p>	<ul style="list-style-type: none"> STAR 110K PUTRA 160K 80% ex-bus Together +5%pa Monorail 45K KTM 70K +9%pa for last 2 yrs <p>KL Total Rail <u>390K</u> ERL ridership is 10K > 14-15% market share</p>	<ul style="list-style-type: none"> LRT1 – reduced to <300K due to inability to field trains MRT2 – 95K (increased now open) MRT3 – 375K <p>Manila Total Rail <u>750K</u></p>	<p>MTRC (2003)</p> <ul style="list-style-type: none"> (excl Airport Line) 2.2mn Airport Line 20K <p>KCRC (2003)</p> <ul style="list-style-type: none"> East Rail domestic 540K LRT 290K 	<ul style="list-style-type: none"> Total MRT ridership understood to be 2.5mn rides/day. NEL ridership in Year 1 about 150K 	<ul style="list-style-type: none"> Underground 2.9mn/weekday DLR 150k/weekday Tramlink 60k/weekday NSE 2.1mn/weekday
<i>Capacity</i>	Not an issue	PUTRA is at capacity at peak times. This should be a short-term problem only. More cars are needed to increase output	An issue for MRT3, both short-term (need for more cars and/or fares to rise) and medium term (overall system capacity)	Not an issue	Not an issue	Peak crowding in central London and especially at major interchanges forms part of the rationale for the Crossrail scheme.
<i>Impact on Development</i>	Developers increasingly want direct links to MRT + MRT is allowing densification in the CBD	Major dev'ts did not happen. Future dev't will happen when the property market recovers e.g. Sentral Station	Developers have belatedly recognised the importance of MRT. MRT3 allowing increasing densification in its catchment area	Development is integrated with MRT by design from the beginning. MRT is central to the HK urban structure	MRTY supports/ is essential to Singapore's chosen dense development plan. NEL is integrated very effectively with development along its corridor	DLR and recent Underground extension key to major urban regeneration in east London. Tramlink thought to be helping sustain suburban commercial centre.
<i>Impact on Environment</i>	1995 Cabinet decided MRT (not xpw'y) should be underground. BTS	STAR, PUTRA – substantial elevated construction. No	MRT3 basic in design, Stations unattractive, poor functional design. MRT in centre of major	Much of MTR and West Rail are underground. Elevated sections partly	Initial System attractive design Increasingly under	Much of MTR is underground Noise barriers used to

	BANGKOK	KUALA LUMPUR	MANILA	HONG KONG	SINGAPORE	LONDON
	<ul style="list-style-type: none"> exempted (under const'n) BTS fully elevated. Some issues during imp'n. 'Canyon' effects down Silom. High quality of design Blue Line fully underground, no issues 	<ul style="list-style-type: none"> information on any issues Monorail – high quality design, some problems during imp'n, fits well with environment 	EDSA corridor	<ul style="list-style-type: none"> noise-shielded Increasingly strenuous efforts to mitigate env't problems 	<ul style="list-style-type: none"> grounding justified No major issues` 	<ul style="list-style-type: none"> shield elevated system from adjacent dev'ts
Cost to the Exchequer²⁸	<ul style="list-style-type: none"> BTS – 0 until now (other than depot land) BL – cost of the civil works to now US\$2.5bn 	<ul style="list-style-type: none"> All concessions – soft Gov't loans STAR, PUTRA – both concessions failed, assets are now with SPNB (gov't company). Monorail – 0 until now 	Gov't said to incur an un-planned US\$30-60mn pa due to revenue shortfall	Until now MTRC and KCRC have received no public subsidy, only public investment on which government received a return .	The full cost of the MRT system: <ul style="list-style-type: none"> Initial System S\$4.7bn Woodland Ext S\$1.3bn NEL S\$ 5bn Other (Changi, LRT's) S\$2bn 	<ul style="list-style-type: none"> The Underground PPP appears to cost about £1bn/year. Croydon Tramlink cost £140mn capital grant. DLR has cost the public purse about £1bn (at current prices)
Appropriateness of Solution	<ul style="list-style-type: none"> BTS wholly appropriate B.L appropriateness depends on justification for under grounding. 	<ul style="list-style-type: none"> STAR – alignment may be questioned PUTRA – technology justified on basis on portraying 'high-tech' Malaysia Monorail - ditto 	MRT3 – some concern about future capacity	<ul style="list-style-type: none"> MTR lines understood to be wholly appropriate ...although some concerns over Airport Express's finances (only) Some concerns over West Rail alignment pending its extension 	<ul style="list-style-type: none"> MRT wholly appropriate Experience of full automation on NEL awaited Some concerns about the viability of the LRT people-mover concept as feeders to MRT stations 	<ul style="list-style-type: none"> The approach of 'horses for courses' seems to have been generally quite successful although the cost overruns and performance shortfall on the recent Underground extension suggest that the conventional method of procurement performs less well than by concessions.
Success against Forecasts	<ul style="list-style-type: none"> BTS ridership forecasts high BL just open (too early to tell) Costs OK 	In all cases ridership forecasts were high	<ul style="list-style-type: none"> MRT3 – revenue forecast high (ridership OK but at modest fares) MRT2 – costs higher, ridership/ revenue likely lower (ridership now fully open awaited) 	With 2 exceptions, understood to be good. Airport Express and West Rail both suffer from unrealised ridership/ revenue forecasts	<ul style="list-style-type: none"> Initial System and Woodlands Ext out turned close to forecasts NEL ridership forecasts high. Costs OK 	<ul style="list-style-type: none"> DLR traffic has grown well in excess of original expectations The (Underground) is not carrying its target traffic. As this has to build up with the associated development. Tramlink is carrying about 20% less traffic than forecast.

²⁸ Other than tax breaks and incentives offered to many investors

Annex D Record of MRT Success

This Annex reviews the experience of metro/ LRT projects in achieving their forecast performance when they open, first drawing on worldwide experience, and then detailing the experience of the case study cities.

D.1 Worldwide Experience

Table D.1 summarises the research results detailed by the referenced authors.

TABLE D.1 WORLDWIDE RECORD OF MRT SUCCESS

Year	Source	Where?	Outturn compared with Forecast at time Project Committed	
			Capital Cost	Ridership
1973	Merewitz ²⁹	Europe/N. Am.	Ave. > +50%	
1986	Wachs ³⁰	USA	Ave > +50%	
1990	Halcrow Fox ³¹	Developing cities	Half between +50 to +500%	Half between -50 to -90%
1990	Pickrell/UMTA ³²	USA	Range +17 to +156%	Range -28 to -85%
1996	Skamris/Flyvbjerg ³³	Worldwide	Range -15 to +500%	Range +30 to -90%
1998	Halcrow Fox ³⁴	Worldwide – private	No improvement over public sector	No improvement over public sector
1998	Mackett/Edwards ³⁵	UK, USA		2 out of 13 ‘successful’
2000	Halcrow ³⁶	Asia – private	No improvement over public sector	No improvement over public sector
2000	Skamris ³⁷	Worldwide	Range -46 to +200%, aver +46%	Range -96 to +1% Average -51%
2000	Babalik ³⁸	North America, UK		Range -82 to +89% (8 selected systems)

²⁹ Merewitz L, 1973. How do Urban Rapid Transit Projects Compare in Cost Estimating Experience?, Proceedings from International Conference on Transport

³⁰ Wachs, 1986 ‘Technique vs. Advocacy in Forecasting: A study of Rail Rapid Transit’, in Urban Resources, Vol. 4 no. 1, Fall

³¹ Halcrow Fox, 1990 ‘The Performance and Impact of Mass Rapid Transit in Developing Countries’, by Allport RJ and Thomson JM, TRRL Research Report 278

³² Pickrell DH, Urban Rail Transit Projects: Forecasts versus Actual Ridership and Costs. Report DOT-T-91-04 UMTA US Department of Transportation 1990

³³ Skamris M and Flyvbjerg B (1996) ‘Accuracy of Traffic Forecasts and Cost estimates on Large Transportation Projects’, TRB Record No.1518, Washington DC

³⁴ Halcrow Fox, 1998 ‘Realising the Potential of MRT Systems in Developing Cities’ by Allport RJ and Bamford TJG presented at the 8th World Conference on Transport Research, Antwerp, July 1998

³⁵ Mackett R and Edwards M, 1998 ‘The Impact of Urban Public Transport Systems: Will the Expectations be Met?’, Transpn-Res. A, Vol. 32, No 4, pp231-245, 1998

³⁶ Halcrow Fox, 1998 ‘Realising the Potential of MRT Systems in Developing Cities’ by Allport RJ and Bamford TJG presented at the 8th World Conference on Transport Research, Antwerp, July 1998

³⁷ Skamris M. ‘Economic Appraisal of Large Scale Transport Infrastructure Investments, PhD at University of Aalborg, December 2000

³⁸ Babalik E ‘Urban Rail Systems: A Planning Framework to Increase their Success’, PhD thesis submitted to University of London, 2000

Recent research into selected case studies in Asia/ UK that encompassed both public and private sector procurement sought to understand why this situation exists³⁹. The conclusions were that

- *Capital cost forecasting* appears to be carried out diligently; while *operating cost forecasting* received little attention and often was not reported in any detail; and the effort put into *ridership/ revenue forecasting* varied very substantially.
- To a greater or lesser extent all projects followed a common transport planning approach in developing ridership forecasts. This featured a major often multi-mode transport model that was usually dated. Major new targeted surveys were rarely undertaken. Forecasts were made on the basis of many assumptions. No formal risk analysis was undertaken. No ‘reality checks’ on the forecasts were undertaken, to provide confidence that they fitted with the real-world experience of comparable projects.
- The result in all cases ranged from optimistic to misleading. In no case were the forecasts other than high, and often they were very high.
- The obvious question is why this happened. Part of the answer is provided by those who procured the forecasts for what purpose, and who carried them out for what purpose
- These forecasts were, to a greater or lesser extent, misleading in helping decision-makers make weighty decisions about future strategy and resource allocation
- Only in one case was a formal post-evaluation carried out, and in every case but one MRT extensions were being actively promoted on a similar basis.

D.2 Case Study Concessions

The evidence of the 6 concession projects that are the subject of this report is summarised in **Table D.2**.

³⁹ Allport RJ, 2004 ‘Improving Decision-making for Major New Metro Projects – Interim Report’, presented at UITP 78th Metro Assembly, Tehran

TABLE D.2⁴⁰
RECORD OF CONCESSION PROJECT SUCCESS

Project	Outturns Compared with Forecasts when Project Committed			
	Imp'n time	Capital cost	Operating cost	Ridership
Bangkok BTS	1 month early	OK		25% forecast
Blue Line (concession only)	OK	OK	OK	Early days– 50%?
KL – STAR	OK	Some overrun absorbed by concessionaire	Some increase	25% forecast
KL – PUTRA	6 month delay			
KL – Monorail	Major delay ⁴¹			Half forecast?
Manila MRT3	6 month delay	Slight overrun absorbed by concessionaire		One-third forecast
Manila MRT2	<i>Major delay</i> ⁴²	<i>Major overrun</i>		<i>One-quarter forecast?</i>

A caveat is required in comparing outturn performance with forecasts. For the comparison to be meaningful it is necessary to compare outturns with forecasts *at the time the project committed*. There is a tendency as the project advances for outturns to be compared with more recent forecasts, to minimise adverse variances. We have sought to avoid this, but inevitably there will be examples where it applies. The comparison presented here is therefore if anything likely to be optimistic.

The latter set of results (in Table D.2) are in two respects encouraging compared with the earlier experience: implementation cost is close to estimate and any overrun contained within the concession company, and the implementation time ranges from slightly ahead of estimate to about +30%. There is no reliable information in respect to operating costs.

The public sector Manila MRT2 project is shown for comparative purposes. This suggests that indeed the discipline of the concession regime has a major influence. But – the problem of very optimistic ridership forecasts remains. It is this that has more than anything else crippled the concession finances in every case but one. This exception was Manila MRT3 where the concessionaire took no commercial risk. Ridership forecasts are used both to size the system and determine its financial structure. When these are far too high, then far too many trains may be procured (as happened on at least two projects) and misleading confidence placed in forecasts of concession viability

⁴⁰ Table shows how the projects studied by each source compared with forecasts at the time they were committed

⁴¹ Construction abandoned at one stage. Then delay of 17 months once project relaunched

⁴² In 1994 forecast implementation time 4-6 yrs. Project fully open Oct 2004

Annex E Stakeholder Attitudes and Motivations

E.1

Motivations

Experience of concessions worldwide has demonstrated that the effectiveness of this approach depends upon understanding the motivations of the key stakeholders, and designing concessions that attract them and allow them to play to their strengths.

Virtually all stakeholders focus on MRT infrastructure, and none on operations. The contract (the concession contract, achieving financial close, the prime contractor's contract etc) is considered to be the first – and often the main achievement, and the opening of the railway the second, major one. What happens thereafter appears to receive little attention by any stakeholder – other than any party taking a higher-than-expected financial hit and the operator charged with keeping the system running. At first sight this is surprising, since the central justification for investment is usually⁴³ to improve travel and traffic conditions.

Politicians and Government technocrats usually seek to provide a safe, reliable and affordable mass transit system for their citizens, while reducing traffic congestion and pollution. Political recognition often plays a part too. One would expect them to have a strong focus on the impact of operations, and it is interesting why this is not generally so. In part it is probably because of the complexities of MRT systems that – understandably – are little understood when cities embark on new systems. Governments (and private sector players) often base their expectations on their experience of BOT urban expressways (all 3 cities have these). That MRT systems are fundamentally different is not recognised: MRT traffic is difficult to attract (while most roads 'fill up' unless tolls are high) and MRT systems have high operating / asset replacement costs (expressways do not). When governments implement roads, they seem simple and they work; but when they come to MRT systems, these are complex and they require this complexity to be managed. Thus MRT systems are very much more demanding to develop successfully and inherently more risky investments.

MRT systems involve large investments in civil works and electrical/mechanical systems, and for successful **contractors/ suppliers** often restricted competition – and therefore large potential profits. These parties therefore always tend to promote such projects. Their objectives are to sell their equipment and services, develop a long-term relationship with the client, supply parts and be in a position to bid for expansion/extensions – and maybe provide maintenance and take operational responsibility – but to take on no long-term financial commitments.

Sometimes they are required to provide equity stakes in the special purpose Project Company created in the expectation that this will encourage them to focus on whole-life costs, ensuring the durability of the core assets. These private companies have a duty to their shareholders to maximise shareholder value, and they perceive this is best

⁴³ In some cases – as in Malaysia there may be wider objectives too

accomplished by a dominant focus on securing front-end profits, and seeking a minimal exposure during operations. There is only limited evidence that major equipment suppliers have an interest in operations other than in supplying parts etc. Attempting to tie contractors/ suppliers in by equity stakes has limited success – most price this into the construction/ supply contract prices; and most project companies aim to list on the stock exchange, diluting the stakes of the original shareholders and providing an exit route for some.

Concessioning provides a major area of business for **advisers** – traffic, technical, financial, legal etc. They are also private companies with commercial interests. The ‘independent adviser/ consultant’ is assumed in the concession process to offer independent advice – yet the evidence is often that advice correlates closely with client interests. This can be a particular problem with traffic/ revenue advice.

The case studies demonstrate the potential for well-structured concessions to align stakeholder and project interests. Most financing for MRT concessions (typically 80%) is provided by banks, and capital markets **Financiers** require to invest their funds with a return – interest in the case of debt (and repayment of the principal in full at the contracted times) and a rate of return in the case of equity. They require the project to generate a profit, hence they look for the project company’s ability to control its revenue by setting tariffs and control its costs, and they look for a stable environment with no/ minimum interference from government. Development banks can play an important role in providing some security to the project financing, thereby securing the participation of commercial banks.

Appropriately, the last stakeholder category to be mentioned is **operators**. They are typically involved in project development late and often have limited influence. This is an issue to which we return.

E.2

Attitudes

The study mission has provided opportunities to question a wide range of respondents about their perceptions and attitudes. Some of the respondents provided expert advice about their project, and were also experts in their area of expertise. **Table E.1** encompasses the range of viewpoints provided, insofar as possible in the words used.

It is striking that support for MRT systems is enduring. It extends to most of the key stakeholders, and extends over time. The reason appears to be that MRT serves many agendas – efficiency, the ‘green’ environmental and energy agenda, developmental, anti-pollution, quality of lifestyle etc as well as broader strategic objectives in Malaysia. Thus most large cities aim to develop and then expand MRT systems, and few oppose them.

Yet few stakeholders appear to understand the complexities of MRT systems, their risks, economic impacts, the arguments for public investment support, and their financial realities. The focus is usually on the infrastructure contract (seen as a success in its own right), on the next project – and not on operations, or on integration to improve operations. The need for planning is not widely recognised; instead it is assumed that projects can be developed largely by the private sector in the public interest.

Public servants may fail to recognise the significance of risk, and assume that the private sector will carry it and that the resulting project will be in the public interest. Sometimes they assume they can transfer all risk,

without recognising that – as KL has found with STAR and PUTRA – ultimate risk of failure is carried by Government. They may also fail to understand the central importance of operations from the earliest stages in project development, and hence the need for an Operator to influence decisions.

In all cities MRT was expected to ‘solve’ the problems associated with traffic congestion. When it has failed to do this - in KL and Bangkok it has led to a fundamental re-think, and to a changed policy. One result of this would be to reduce the role of private concessions and scale of private financing. More generally attitudes to concessions have become notably hostile as experience of MRT financial realities has been revealed.

The bankers interviewed summed up their views of MRT concessions in the following terms:

“Investors have a huge range of investment opportunities. They will invest where the returns are best given their appetite to take risk. Their perception of a risk is influenced by 1) perceptions of the industry at large and 2) perceptions of a client/ country. Their perceptions of an industry are not confined e.g. to that of MRT concessions, but to the overall sector. The only way to attract finance for risky projects in a risky environment is to provide the prospect of high returns.

“Rail projects are unique in having a high capital requirement, producing a low return on capital, having a long gestation period and providing considerable construction risk and commissioning risk and ridership risk. The only redeeming features are that once committed, they are incredibly difficult to stop, once there they are essential - they will never be closed, and once built they are (with maintenance) there for all time”.

TABLE E.1 STAKEHOLDER PERCEPTIONS AND ATTITUDES

STAKE-HOLDERS	QUOTATION
Government Technocrats	Of Metros: “Government’s focus is for rail to be the backbone (of urban transport strategy)”
	Of Finance: “The No1 problem is money. It should be for the Ministry to resolve, but they ignore it. Maintenance is not happening. It will affect the service”
	Of Concessions “We waste a lot of money contributing to private sector projects without any benefit” “Government owns 80+% of the project yet cannot control things. The private sector gets all the profit for a minority stake” “Government cannot let transit systems fail, and have to underwrite the risk in the event of potential failure “The private sector concessionaires are not in a position to extend their system without major government support” “Government must buy back the concessions to integrate them. Then it must do things right. This type of project cannot be done by the private sector. In Japan and the United States it is not. Nowhere does the private sector do this...” “No-one wants to take revenue risk” “The private sector is better than the public sector at everything. We know that” “Government’s approach is broadly to put in place the BOT Law, reacting to approaches, secure real competition – and <u>then</u> worry about the concession terms. Government is flexible in obtaining agreement” “Government’s approach to risk transfer is that the private sector should take almost all risks with Government using its best efforts where it has responsibility – land acquisition, resettlement etc
	Of the Project Dev’t Process “A strong proponent with access to the ears of the President is essential during the initial stages, from concept to contract signature”
Project Developers	“Once the contract is signed, the project becomes irreversible – even though it will probably be modified many times”
	“Few people in Government understand rail projects”
	Of Government “They thought MRT was like an expressway. They had no understanding of a metro.....Their focus was on infrastructure and technical requirements - not operations”
Concessionaires	“They did not understand what a concession was”
	“It is very difficult to have a lean Government Authority”
	“The Government rail and bus corporations are not shining examples of public sector management efficiency”
	“Government has a culture of being a bad client, and not paying its suppliers”

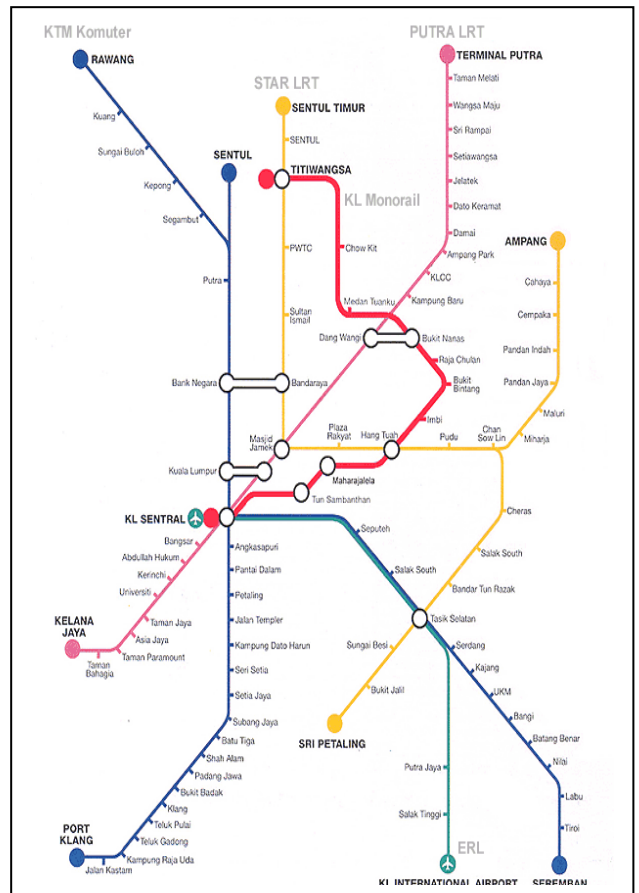
STAKE-HOLDERS	QUOTATION
	<p>Of the Project Dev't Process "Planning was not done and this was important. I recall that serious planning used to be done" "As a policy, Government refused to provide a 'minimum ridership guarantee' so we were left to rely on our Consultants" (Re equipment): "We did not know what we had bought. We thought we had a certain capacity. But when we operate, we find it is only half this". "Because they (Gov't) have many staff they look for things to do. They collect a raft of detail, but there is no regulation of overall performance" Of MRT Projects: "Railways were not understood. Not the same as expressways!" "Malaysian projects routinely have poor success, but those overseas do not" Of Support to Operations "When Government acts against its interests, I ask 'why are you destroying your investment?'" Of the Future "Government would have to take at least most revenue risk in the future"</p>
Forecasters	<p>"Forecasts involved the collection of <u>secondary</u> traffic and land use data and reviewing the results of previous studies" "It is expected that Government shall implement traffic restraining measures including area road pricing in the City Centre by 2005.... It is expected that implementation of themeasures will increase the PT model split to 40% in 2005 from 25% in 1997, and60% by 2020 Elevated pedestrian bridges from the system have been assumed to adjacent buildings An extensive feeder bus service to reinforce the rail service has been assumed"</p>
Bankers	<p>Of MRT concessions "What immediately comes to mind is a black hole" "For MRT projects if anything it is even more inappropriate and difficult to attract private capital now than 5 years ago" "The only way to achieve this is to provide high returns. Banks will always lend – given the security" "I would not invest a dollar in such a project"</p>
Mainline Rail Operator	<p>"We are on our own. The Ministry (of Finance) supports MRT – the new railway. It does not support us. It is unclear what will happen"</p>
Operators	<p>Of Involvement in Developing Rail Strategy "This is produced without operator input, Government's attitude is: once we've decided, your role is to implement" "There is no money – to do anything. This is a real problem"</p>
Independent Commentators	<p>Of the need for Private Financing "There is a pressing need for a step change in private investment: government needs to spend \$6bn pa on infrastructure, and is now spending just \$1bn" Of the Project Dev't Process "Government's whole focus is on signing a contract and construction – not operations and performance. A contract is regarded as an</p>

STAKE-HOLDERS	QUOTATION
	achievement”
	“Some Government staff would not recognise a risk if it hit them in the face”
	“The whole BOT Law is construction-oriented”
	“The oversight agencies don’t want to know what really goes on regarding line agencies and the projects”
	Of Regulation “Are there any professional regulators in Government?”
	Of the Organisation for Operations “McKinsey’s reported this was the only system in the world to have a maintenance contract that does not include spare parts”
	“Maintenance is not a strong point in this country”

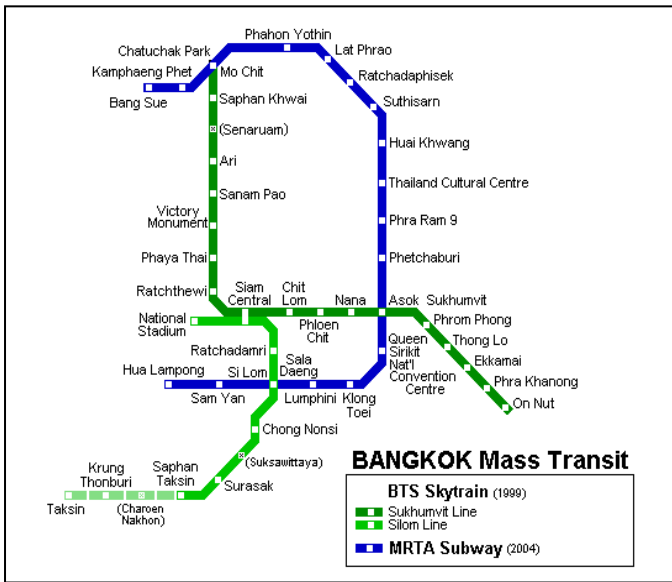
Annex F MRT Systems in the Case Study Cities



Manila MRT Network



KL MRT Network



Bangkok MRT Network

TABLE A.1 CONCESSIONS PROJECT DATA

				Bangkok		Kuala Lumpur			Manila MRT3		
				BTS	Blue Line	STAR	PUTRA	Monorail			
Financial	Currency			Baht		Ringgit			Peso		
	Rate to US\$ 2004			40		3.8			55		
Timing	Opened for revenue service			Dec-99	Jul-04	Phase 1: Dec 1996; Phase 2 Summer 1998 to Commonwealth Games, and Dec 1998 for north ext	Phase 1 - Aug 1998, Phase 2 June 1999	Aug-03	Jul-00		
Institutions	Agency			Bangkok Metropolitan Administration	Metropolitan Rapid Transit Authority	Economic Planning Unit (under PM's Office)	Economic Planning Unit (under PM's Office)	Department of Railways	Department of Transportation and Communications		
	Concessionaire			Bangkok Transit System Corporation (BTSC)	Bangkok Metro Company Ltd (BMCL)	Sistem Transit Aliran Ringan Sdn Bhd (STAR)	PUTRA (Renong subsidiary)	KL Monorail System Sdn Bhd (KLMS)	EDSA LRT Corporation		
	Main shareholders 2004			Tanayong	Ch Kamchang, Natural Park, BECL, 3 Thai banks	Malaysian Gov't - 50%, Taylor Woodrow/Adtranz (AEG) JV - 30% and Other investors - 20%	Renong		ELC (project developer), 4 Filipino developers (Fil Estate, Ayala Land, Anglo Philippines, Greenfield) Ramcar		
Project Data	Main creditors				4 Thai banks				JEXIM, Czech supplier credits, Local banks		
	Route/ role			2 routes with interchange between them, through the heart of the CBD	Bang Su to Hua Lumphong (main station), Combined radial and distributor	3 radials to City Centre. Phase 1 along a disused rail ROW east. Phase 2 to Commonwealth Games south + short spur north	2 radial corridors linked under/ through the City Centre	Distributor between existing rail lines, connects central major developments	Aligned down the centre of Manila's main thoroughfare - EDSA.		
	Depot			Mor Chit	Huai Khwang - capacity for 500 cars	Ampang	Subang	Sentral Station	North Triangle, adequate to store 120 cars		
	Route-kms	Elevated		built [as in contract]	23.5 [14.5]	0 (0)	9.4	22.3	8.6	8.8	
		Underground			0	19.9 (22.6)	0	4.4	0	1.4	
		At-grade			0	0 (0)	17.6	2.3	0	6.7	
		Total			23.5 [14.5]	19.9 excluding end of line/ depot access (22.6 all-in)	27	29	8.6	16.9	
	Stations	Elevated			23	0	8	18	11	13	
		Underground			0	18	0	5	0	9	
		At-grade			0	0	17	1	0	2	
Total			23	18	25	24	11	24			
Technology			State-of-the-art Siemens metro	State-of-the-art Siemens metro (as BTS)	Standard no-frills high-platform LRT system using AEG cars	Fully automated driverless system, powered by LIM (based on Vancouver)	Monorail - Malaysian built, based on Seattle ALWEG system	Czech streetcars			
Capacity provided	Car capacity @6m ² pax/ hr/ direction		9-car trains carrying 2000pax @ 2 min headways = 60,000. 105 cars owned	19 * 3-car trains owned (expandable to 6-car). Each car 3.1m wide * 22m long.	2-car trains, expandable to 3-cars providing 33000	70 cars owned. 2-car trains operate (width 2.65m) providing 10,000. Expandable to 4-car trains (256 cars) 30,000	12 no. 2-car trains operate. Expandable to 6-car trains. Operating @2.5min headways gives a system capacity of 15,500	73 cars owned. 2.5m wide. Contracted capacity is 23,600 pass/ hr/ dir/n. 3-car trains operating at 3 min headways			
	Train capacity		no	900-1000 per 3-car train @ 6 pass per sqm standing	1200			1182 for 3-cars			
	Maximum capacity pass/hr/ direction			57000		30,000		4-car trains operating at 2 min headways = 47,300			
Operations Data	2004	Integration		Physical integration with rail	No	Bus stops moved, and intermodal transfer facilities imp'd at 8 stations	Integration could be better	Integration could be better	With STAR and PUTRA is good. At Sentral Station is poor	None defined. Very poor interchange with the important MRT2. Not good with LRT1	
		Ticketing			(BTSC have decided to install ticketing compatible with Blue Line)	Touch-screen smartcards. Not integrated		Touch n'Go smartcards shared with other systems	No	No integration	
		Fares			No	No fares integration	No	No	No	No integration	
		Buses			No	Some bus feeder services provided by BMTA. Competing routes exist	Some 'PUTRA' feeder buses serve STAR stations. Bus and taxi ranks at many stations	90 'PUTRA' feeder buses operate at subsidised fares, within 3kms of stations. Bus and taxi ranks at most stations	No	No integration	
		Cars			No	2 sites, one for 2000 cars (MS car park) and one 200	Yes 1100 spaces in Phase 1, little opportunity in Phase 2	3500 park-and-ride spaces at 9 stations	No	No integration	
		Marketing			No	No joint marketing	Yes since SPNB took over assets and operations	No	No	No integration	
		Operating hours			18hrs/ day	19hrs/day	18hrs	18 hrs		18hrs	
		Operations		end to end speed	kph	35	35	35	38	30	35
		Overcrowding		na	almost	na	No	Yes, substantial overcrowding at peak times		Yes already occurring	
		Headways		mins	2.5 - 3 mins peak		4-6 mins peak, 6-10 mins off-peak (halved on shared track)	3 mins peak, 5-10 mins other times			
		Reliability			Extremely reliable	Yes	OK	Understood to be excellent			
		Tariff 2004		Single trip	Bt		14-36 (Year 1 - 15% discount)	0.3 to 2.8	1.2 to 1.5	9.5 increasing to 24 pesos	
		Concessionary fares				Half fare for those <1m tall and 65+ age. Year 1 15% discount	Children under 12/ in uniform			No	
		Multi-trip discounts				No	Yes small discount on stored value			No	
		Travelcards			Yes 30-day adult and student cards	No	Touch n'Go smartcards	Touch n'Go smartcards	Touch n'Go smartcards	No	

				Bangkok		Kuala Lumpur			Manila	
				BTS	Blue Line	STAR	PUTRA	Monorail	MRT3	
Ridership/day	Year 1	000s/average day	160	Year 1 is 2004/5		1997 (Phase 1) - 50; 1999 (first full system) - 65	2000 (first full year)	see below	In 2000 with high tariffs (17-34 pesos) and final stations not open, ridership 70-80. Tariffs reduced by one-third + line complete: 170 by year end.	
	2004 (latest)	000s/average day	350	approx 200K/day at reduced flat 10B fares. Reported to be about 120K/day at Year 1 discounted fares		110	150	45 (Note: running only 8 of 10 trains to date)	375	
	Ridership characteristics			Sat/ Sun 70% of weekday	Major park and ride said to be heavily used	Ridership peaked. Weekend 70% of weekday			Very congested at peak times. Typically 64 of 73 cars fielded	
	ridership/station 2004			15	7	4	6	4	16	
				19% increase in last year		80% ex-bus			Robust 10%/pa growth	
					Reported to carry 70% of all visitors to Commonwealth Games stadia (1998)				Long queues for tickets	
									2 serious operational incidents	
Financial Data						For 2 Phases + Total RMBbn:				
	Investment cost	Land acquisition	Domestic bn		25					
		Civil Works		23	75.5	0.45/ 0.9 = 1.35		500	US\$ 361mn	
		E&M equipment		26	17.5	0.5/ 0.85 = 1.35	1.9	530	US\$ 104mn	
		Other (consultants, financing etc)		6	5	0.25/ 0.45 = 0.7		150	US\$ 213mn	
		Total	Domestic bn	55	123	1.2/ 2.2 = 3.4	5.85	1180		
			US\$bn	1.38	3.08				US\$ 678 mn	
		Note		Figures for project as built. BOT E&M Eqpt only. Excludes asset replacement costs						
				Bt bn	Bt bn	RMBbn				
	Financing	Equity		18.5	7.2	0.7		260	US\$ 190mn	
		Debt - domestic		12	11	2.8 (of which 0.7 Gov't support loan. 2.1 Commercial loans)		Govt soft loan 300	US\$ 110mn	
		Debt - Foreign		25	7			Infrastructure loan 620	US\$ 378mn	
		Total		55.5	25.2	3.5		1180	US\$ 678mn	
		Debt: equity ratio		2 to 1		4 to 1			2.6 : 1	
		Note		JBIC loans financed most of the Gov' financing for civil works						Financing 100% public sector under soft loans
Revenues	Fares	2004	2.3	too early						
	Ancillary		0.2					Note there is aggressive advertising. 30% of revenues from non-farebox		
	Total		2.5			13		130mn/ month		
Operating costs		2004	1.2	too early		10		see below		
Farebox ratio	Revenues/ Operating cost		2.1	too early	STAR revenues cover operating costs (In 2000, FR=1)	PUTRA revenues more than cover costs.	"revenues cover operating costs"	Cost including rental payments 40% higher than revenues, and rental payment about to escalate		
					Overall FR = 1.3 (STAR + PUTRA)					
Concession Contract Data	Status of concession		Contract signed April 1992. Concession operational. Finances being restructured	Contract signed August 2000. Concession operational	Concession failed. Assets acquired by Gov't asset company SPNB Sept 2002	Concession failed. Assets acquired by Gov't asset company SPNB Sept 2002	Operational. Concession period 40 years from Dec 2000	Contract date September 1997 Concession operational		
	Scope/ type		Civil works structured on BTO basis, with ownership transferred to BMA on construction completion + E&M works and operations on a BOT basis	BOT relating to E&M equipment financing/supply, operations and maintenance, subject to a revenue sharing arrangement with MRTA. MRTA retain ownership of civil works	BOO indefinitely subject to review after 60 years	BOT for 30 yrs + extension for 30 yrs	BOT for 40 yrs + extension for 30 years	BLT - concessionaire finances and implements the project, then provides capacity for 25 years in return for a guaranteed revenue stream. DOTC takes all operations and commercial risk. Development profits above stations and at depot are shared		
	Concession contract available?		Yes (Annexes not seen)	Yes in full	No	No	No. The KL Infrastructure Group Prospectus for listing provides some information	Yes		
	Concession Terms									
	Structure of Project Company		Construction: Tanayong to hold at least 51% shares	Construction: original shareholders to retail at least 51% shares						
	Risk Allocation		Operations: Thais to hold at least 51% shares	Operations: BMCL plan to list. MRTA have right to purchase up to 25% shares. Original shareholder shares will be diluted						
	Right to use land		defined	defined			Gov't acquire at cost to concessionaire	Defined (depot, in centre of EDSA)		
	Land acquisition					Gov't undertook to provide 20m ROW unencumbered. The Company had to be proactive.	see above	Gov't		
	Relocation					Gov't responsibility		Gov't		
	Utilities diversions		liability limited to Bt 500mn	na. MRTA responsible for land/ civil works		Company responsibility	Company responsibility	Gov't		
Construction							Company			
Delay to opening				Large delay costs Bt7mn/day	Project company			Company - capped		
Energy costs			rate to be no higher than for large industrial consumers		Pre-agreed with Govt			Gov't		

			Bangkok		Kuala Lumpur			Manila MRT3
			BTS	Blue Line	STAR	PUTRA	Monorail	
Operations	Performance Regime		Defined in Annex (not seen). Understood to be limited performance measures					
	end to end speed	kph		35				not defined
	Overcrowding			not more than 8 pass/metre sq for 4 stations				not defined
	Headways	mins		Peak <=5, off-peak <=10				3mins min at peak
	Reliability			Up to BMCL: "shall achieve a high level of reliability"				54-60 cars to be running at peak (of 73 owned). General targets for facilities/systems, but no penalties for non-compliance
	Minimum headways	mins		2				
	Capacity pass/hr/ direction			40,000 at min 2 min headways				23600 at peak hours
	Adjustment to service level		yes if demand higher or lower than forecast					not defined
	Other							If <54 (of owned 73) cars is available in peak periods, Company pays liquidated damages, and if >60 it receives extra payments - capped
	Integration							
	Physical integration			Bus stops moved, intermodal transfer facilities imp'd at 6 stations				not defined
	Ticketing			up to BMCL				not defined
	Fares		No	No fares integration req'd				na
	Bus services		BMA will use best efforts	To be complementary - 1) no bus services to operate more than 10 consecutive stations; 2) MRTA to recognise importance of this to viability of the concession				na
Cars			2 park-and-ride sites, one for 2000 cars (MS car park) and one 200					
Ridership				No guarantee	No minimum ridership guarantee. Fares increases subject to approval of Gov't on inflation base. If not approved Gov't would compensate the Company	No	na	
Opening fare			defined	defined		Defined	na	
Fare adjustment			defined on basis of Bangkok Consumer Price Index, including 'exceptional circumstances'. Allowance for changes in foreign exchange rates built in	defined, adjusted on the basis of the Consumer Price Index		Reviewed every 5 years on defined basis	na	
Competition							na	
Right to undertake commercial activities			yes	yes, at stations and one major park-ride site		Yes - provision for major new developments at 3-4 stations including Brickfields/ Sentral + other developments	Defined. Emphasis on this	
Financial	Inflation						Company	
	Foreign exchange						Company (payments in hard currency)	
	Interest rates						Company	
	Tax incentives						Defined	
Exceptional events			Defined. The procedure to be adopted defined	Defined - economic and + Gov't action/ inaction. The procedure to be adopted defined			Defined 'circumstances'	
Financing req'ts				Debt to equity on revenue service not more than 2.5 to 1		Maximum Debt: equity ratio 4:1 at any time	not defined	
Provision for disabled				Yes	No	Yes, comprehensive facilities within stations	Defined	
Expansion and extensions			First right of refusal	No. BMCL to provide access to the Depot for such operator			2 possible extensions developed, requiring action by defined dates to be effective (not taken)	
Termination, Government step-in rights and dispute resolution			Defined. Compensation does not include future profits foregone	Defined. Compensation includes future profits foregone			Defined	
Other	2 amendments to the contract: 1) to change the depot location 2) providing for re-routing to avoid an expressway			BMCL responsible for maintaining civil infra (constructed by MRTA)		Renong started work before signing the concession contract, to be open by Commonwealth Games	Company's main risk is construction (cost/ delay). There after it receives a guaranteed 15% equity ROR + development rights (profits the latter shared with Government)	
				BMCL to pay MRTA a fixed + sliding % of: 1) fares revenue 2) commercial dev't revenue 3) defined excess profits and 4) benefits from low interest rates			Government responsible for interface with road improvements (incl. grade separations)	
							Rental payments to Company by Government in Years 1-10 increase from \$80mn > 110mn pa. Thereafter this rapidly increases. Development profits are additional	