



Private Sector Participation in Urban Transport Infrastructure Provision

Module 1c

Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities

What is the Sourcebook?

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

Who is it for?

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

How is it supposed to be used?

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

What are some of the key features?

The key features of the *Sourcebook* include:

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

How do I get a copy?

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

Comments or feedback?

We would welcome any of your comments or suggestions, on any aspect of the *Sourcebook*, by e-mail to transport@gtz.de, or by surface mail to:

Manfred Breithaupt
GTZ, Division 44
P. O. Box 5180
65726 ESCHBORN
Germany

Further modules and resources

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

Modules and contributors**Sourcebook Overview and Cross-cutting Issues of Urban Transport (GTZ)****Institutional and policy orientation**

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

Land use planning and demand management

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

Transit, walking and cycling

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

Vehicles and fuels

- 4a. *Cleaner Fuels and Vehicle Technologies* (Michael Walsh; Reinhard Kolke, Umweltbundesamt – UBA)
- 4b. *Inspection & Maintenance and Roadworthiness* (Reinhard Kolke, UBA)
- 4c. *Two- and Three-Wheelers* (Jitendra Shah, World Bank; N.V. Iyer, Bajaj Auto)
- 4d. *Natural Gas Vehicles* (MVV InnoTec)
- 4e. *Intelligent Transport Systems* (Phil Sayeg, TRA; Phil Charles, University of Queensland)
- 4f. *EcoDriving* (VTL; Manfred Breithaupt, Oliver Eberz, GTZ)

Environmental and health impacts

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

Resources

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

Private Sector Participation in Urban Transport Infrastructure Provision

Findings, interpretations, and conclusions expressed in this document are based on information gathered by GTZ and its consultants, partners, and contributors from reliable sources. GTZ does not, however, guarantee the accuracy or completeness of information in this document, and cannot be held responsible for any errors, omissions, or losses which emerge from its use.

Acknowledgements

An original version of this paper was written together with Gerhard Menckhoff, of the World Bank. Joshua Nelson, a graduate student at MIT, contributed research and writing to the most recent updated version of this module. Several individuals provided information for this update, although none of them are responsible for the accuracy of the representation contained herein: Thirayoot Limanond, Shomik Mehndiratta, Gerhard Menckhoff, Rodrigo Quijada, Jorge Rebelo, Eduardo Vasconcellos, and Lloyd Wright.

About the author

Christopher Zegras has over a decade of experience working on urban transportation issues in the developing world. He has worked for MIT's Laboratory for Energy and the Environment and for the International Institute for Energy Conservation. He has consulted to the Government of Peru, the World Bank, the World Business Council for Sustainable Development, U.S. AID and EPA, among other institutions, and has written or co-written

several peer-reviewed journal articles and book chapters and numerous reports and working papers. Zegras holds a BA in Economics and Spanish from Tufts University, a Master in City Planning and a Master of Science in Transportation from MIT, and the PhD in Urban and Regional Planning from MIT. He is currently an Assistant Professor of Transportation and Urban Planning at MIT.

Authors Christopher Zegras
(Massachusetts Institute of Technology)

Editor Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH
P. O. Box 5180
65726 Eschborn, Germany
<http://www.gtz.de>

Division 44, Environment and Infrastructure
Sector Project "Transport Policy Advisory
Services"

Commissioned by
Bundesministerium für wirtschaftliche
Zusammenarbeit und Entwicklung (BMZ)
Friedrich-Ebert-Allee 40
53113 Bonn, Germany
<http://www.bmz.de>

Manager Manfred Breithaupt

Editing Manfred Breithaupt, Karl Fjellstrom*,
Stefan Opitz, Carlos F. Pardo, Jan Schwaab

* We would like to acknowledge the role of Karl Fjellstrom for critical review and appraisal of all contributed articles, identifying and coordinating with contributors, and other contributions concerning all aspects of the sourcebook preparation as well as for editorial and organisational supervision during the entire process of the sourcebook's development, from its initial conception until the final product.

Cover photo Karl Fjellstrom
Toll road booths in Buenos Aires, Argentina,
March 2002

Layout Klaus Neumann, SDS, G.C.

Eschborn 2002 (updated June 2006)

1. PSP: why and what?	1
1.1 Urban infrastructure challenges	1
1.2 Approaches	2
1.3 Project finance basic principles	4
1.4 Recent trends	4
2. Experience with PSP in urban transport	7
2.1 Road sector	7
2.1.1 Buenos Aires, Argentina	7
2.1.2 Bangkok	10
2.1.3 Santiago de Chile	14
2.2 Public transport sector	16
2.2.1 Asia	16
2.2.2 Brazil	17
2.2.3 Santiago de Chile	19
2.2.4 Buenos Aires	20
3. Recommendations	23
3.1 Strategic approach	24
3.2 Institutional, legal, and regulatory framework	24
3.3 The evaluation process	26
3.4 Risks & guarantees	26
3.5 Concessions for whom and what purpose?	27
3.6 Implications for major impacts	27
4. The role of international organizations	30
5. Outlook	32
References	33
Citations	33
Other references	36

1. PSP: why and what?

1.1 Urban infrastructure challenges*

The challenges of transportation infrastructure development in a rapidly growing city are well known. Travel demand generally increases with growth in population and per capita income, expansion in infrastructure capacity generally does not keep pace with the demand, and the ubiquitous urban transportation externalities (*i.e.*, congestion, air pollution) result. Among the many barriers—such as environmental and community impact concerns—to transport infrastructure expansion in urban areas, finding adequate sources of finance continues to figure prominently in both the developing and the industrialised world. The finance challenge is exacerbated by: the multiple institutions typically involved in urban transport infrastructure development and maintenance, the range of direct and indirect user fees employed, and the distortions in investment signals that typically result.

In an “ideal world” the urban transport finance system would be designed so that fuel prices cover the resource costs (*i.e.*, the border price) and, perhaps, the environmental costs of carbon dioxide emissions, which are directly proportional to fuel consumption; road maintenance and congestion costs would be charged directly through highly differentiated tolls; environmental costs would be charged through emission fees; and any redistribution objectives would be pursued through non-distorting lump sum taxes (see World Bank, 2001). Such a system would not only send accurate signals to system users to ensure “efficient” system use, it would also provide a sustainable financing source. For example, it has been shown that the revenues generated from efficient congestion charges will exactly cover the costs of providing the infrastructure, if the road provider optimises road capacity (and also is not subject to economies or diseconomies to scale).

Of course, the “real world” of urban transport infrastructure finance is far from ideal. Few accurate, direct user charges exist. Instead, users pay for road space through a variety of indirect mechanisms, particularly fuel taxes and vehicle

license fees, as well as via real estate and other taxes. Furthermore, since fuel consumption is relatively inelastic to price, fuel taxes are often used as an important and buoyant general revenue source for the government. In the developing world, where vehicle ownership rests largely with the wealthier classes, vehicle ownership fees and fuel taxes are also sometimes used for general income redistribution. The picture is further complicated by the fact that the infrastructure supplying “agents” are multiple and fractured—responsibility for construction is often separate from that for maintenance and management, and each of these areas of responsibility often fall to different levels of government (national, regional, and/or local). Thus, in the “real world” the actual state of urban transport infrastructure financing is unclear. There are often no formally established, transparent urban transport infrastructure “budgets” nor explicit fees recognised clearly by users as prices, with different levels of government left scrambling for resources from whatever sources might be at their disposal.

The greatest short term impact of this situation is deterioration of the existing transportation infrastructure. The World Bank (1996), for example, estimated that as of 1992 45% of the entire road network in Latin America and the Caribbean was in need of either reconstruction or rehabilitation, at an estimated cost of US\$2.5 billion per year over ten years. Beyond maintenance, come the massive costs of infrastructure expansion. For rapidly growing urban areas, the subsequent financial pressures are evident. In Indonesia from 1984 to 1989 50% of public sector urban infrastructure spending went to urban transport; in Shanghai 3% of Gross Regional Product is spent on urban transport infrastructure; in Thailand, 25% of government budget in 1990 went to transport capital expenditures in Bangkok Metro region (Midgley, 1994). As of 1999, Bangkok had some US\$30 billion in transport projects in the planning stage, although only about US\$1 billion in funding was apparently available (Menckhoff & Zegras, 1999).

The financial realities form, however, only one of the dimensions of urban transportation infrastructure delivery, which cannot be viewed in separation from social and environmental impacts. Well-planned, well-maintained, well-

* First four paragraphs draw heavily from Zegras, 2002

operated infrastructure is crucial to transportation systems' performing their roles in ensuring adequate levels of accessibility for urban residents and efficient goods transport. The net impacts of urban transportation infrastructure on sustainability cannot be generalised; but infrastructure provision, by influencing urban growth patterns and travel patterns plays a critical role in overall sustainability. The broader issues related to urban transport sustainability in the developing world have been detailed elsewhere (see, for example, Module 1a of this Sourcebook, World Bank, 2001; WBCSD, 2001; WRI, 1996). Here, we focus on the financial dimension of urban sustainability, and specifically the role of the private sector in facilitating financial sustainability in urban transport infrastructure provision. As outlined by the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP, 2001b), financial sustainability requires that an activity:

1. attract funds to finance needed investment and operation;
2. generate revenues to recover operating and capital costs; and
3. provide the financial incentives needed to "attract and sustain wider participation in such ventures".

Private provision of infrastructure can play a fundamental role in assuring such financial sustainability.

1.2 Approaches

Infrastructure delivery approaches need to be viewed in the system context within which the infrastructure functions. These system elements are depicted in Figure 1.

Traditionally, transportation infrastructure has been developed in a process whereby the government awards a construction contract to a firm that builds the infrastructure according to design specifications. The completed infrastructure is passed on to the government for operations and maintenance. Project funding comes from taxpayers and/or user fees.

Private participation in infrastructure aims to take advantage of the private sector's potential advantage in certain aspects of the public infrastructure delivery process—particularly infrastructure delivery and operations and

CAPITAL PLANNING - AN ITERATIVE, POLITICAL PROCESS

- Size, function, location of facilities
- Level of service to be provided
- Assessment of existing facilities/services
- Permitting and rights of way acquisition
- Financial planning for capital development
- Financial planning for operations, maintenance, renewal



INITIAL DELIVERY

- Design – technically approved design
- Technology evaluation – selection of the necessary technological systems (vehicle identification, toll collection train/traffic control)
- Construction – implementation of the design & technologies



OPERATIONS AND MAINTENANCE

- Historically treated differently from initial design and construction costs
- Can account for 80%–90% of a highway's life cycle costs



CAPITAL REPLACEMENT / DECOMMISSIONING

- Often has the attributes of new construction, due to the expected length of service

Fig. 1
Interdependent elements in public infrastructure systems.

Derived from Miller, 2000

maintenance. There are four main types of infrastructure projects that have some potential for private sector participation in ownership and/or management (Silva, 2000):

- **Operations and management contract** – where the private sector takes over a state-owned facility.
- **Divestiture** – the private sector purchases equity in a state-owned facility.
- **Operations and management contract with major capital expenditure** – the private sector takes over management of a

facility for a given period of time, during which significant investments are also made.

- **Greenfield project** – the private sector, or a public-private joint venture, builds and operates a new facility.

In this Module, we focus on the latter two approaches, which we generally refer to as concessions. Infrastructure concessions are often simply referred to as Build-Operate-Transfer (BOT), although the actual delivery mechanisms include Design-Build-Operate-Maintain (DBOM), Build-Own-Operate (BOO), Build-Own-Operate-Transfer (BOOT), Design-Build-Finance-Operate (DBFO), Rehabilitate-Operate-Transfer (ROT), Build-Lease-Transfer (BLT), among others. Table 1 highlights some of the similarities and differences among the common approaches.

The rationale behind urban transport infrastructure concessions is similar to that used in promoting private concessions in other sectors. Some supporters cite the state’s poor performance in infrastructure delivery or highlight the fact that government resources can never keep up with investment needs. Several additional benefits of concessions are also often noted, including: delivery efficiencies in terms of saved time and resources; at least partial risk transfer to the private sector (improved risk management); independent and multiple verification of project feasibility (filtering out of “white elephants”); the introduction of technological and

delivery innovations into projects; improved value from different quality, price, delivery time combinations; reduced public sector staffing needs; and reduction of political pressures on tolls or fares (see, for example, Miller, 2000). Nonetheless, infrastructure concessions are not without problems and detractors. Some of the principal challenges to concessions relate to the typical need for some form of government guarantee, which reduces private sector efficiency incentives. The problems are compounded in the urban transport sector since the investment costs are often high and of no alternative use and demand estimates are often highly uncertain. Further challenges in the urban sector relate to questions regarding exclusivity of service and the need for some level of infrastructure and service integration with a larger network. Table 2 highlights some advantages and challenges of private sector infrastructure concessions in urban transport.

“There is insufficient empirical data to make general conclusions regarding impacts of private sector participation on project costs and, in particular, cost overruns.”

Although concessions in infrastructure offer the promise of lower costs and more efficient

Delivery strategy	Principal characteristics
Design-Build (DB) - not a concession	Traditional, segmented, infrastructure delivery strategy whereby the government provides planning, design, financing, maintenance and operation, with the private sector providing detailed design and construction.
Design-Bid-Build (DBB) - not a concession	Traditional, segmented, delivery strategy, with design fully separated from construction, which are both separated from maintenance and operations; similar to the DB model, government provides all planning and financing.
Design-Build-Operate (DBO) - concession with subsidy	The government procures design, construction, maintenance, and operation from a private concessionaire. The government provides initial planning and functional design and also provides some portion of the cash flows required to finance the project.
Build-Operate-Transfer (BOT) and Design-Build-Finance-Operate (DBFO) - concession without subsidy	The government procures design, construction, financing, maintenance, and operation from a private concessionaire. The government provides initial planning and functional design, while the concessionaire assumes all financial risks.

Miller, 2000

Table 2: Some advantages and challenges of BOT in transport infrastructure

Advantages	Challenges
<ol style="list-style-type: none"> 1. Not necessary to increase public expenditures for infrastructure. 2. One firm in charge of construction and maintenance creates incentives for construction quality. 3. Private firms more efficient than state-owned firms. 4. Cost-based user fees easier to justify politically when infrastructure providers are private. 5. Positive distributional impacts (those who benefit, pay). 6. Market mechanisms guide project selection. 	<ol style="list-style-type: none"> 1. Potential inefficiencies due to user fees possibly exceeding marginal costs (in order to cover capital costs). 2. Creating the appropriate contract award mechanism and regulatory and contractual framework. <ul style="list-style-type: none"> • To reduce firms' fears of expropriation; • To regulate resultant monopoly; • To mitigate likelihood that firms will press for guarantees and renegotiations. 3. Balancing risk allocation and incentive structure. <ul style="list-style-type: none"> • So firms do not underbid in expectation of future renegotiation; • To not reduce the "white elephant" filter function; • To reduce the risk of "privatising profits" while "socialising losses".

Engel *et al.*, 2001

project delivery, there is insufficient empirical data available to make any general conclusions regarding the impacts of private sector participation on project costs and, in particular, cost overruns. In a recent review of 258 transportation infrastructure projects around the world (worth US\$90 billion), Flyvberg *et al.*, (2002) found systematic underestimating of project costs—but they note that the data is insufficient to determine whether private projects perform better or worse than public ones.

1.3 Project finance basic principles

Urban transport infrastructure projects, similar to other large infrastructure projects, typically require large capital expenditures to produce assets with long useful lives. Incorporating private sector participation into the development and operation of such projects requires a sound understanding of the most relevant features of project finance. For infrastructure concessions, basic features include (Estache and Strong, 2000):

- The creation of a "special purpose vehicle" (SPV) by the concessionaire (generally a consortium of partners). The SPV is typically isolated from the partners' other business activities, with funds borrowed based on the SPV's cash flow and equity (*i.e.*, "off-balance sheet financing").
- Bank debt serves as the primary funding source, with the project assets as principal collateral.
- Concessionaire equity committed up-front, prior to any debt finance.

- The project's cash flow forms the basis of debt and equity payments, with payments to equity holders subordinate to operating costs and debt service obligations.
- Lenders have limited recourse, when the project is operational, to the project owners (either the concessionaire's equity or the government).
- The entire process requires strong contractual commitments.

Major factors that influence project finance include: the term of the concession; the length of the construction period; any subsidies for capital and operating costs; the concession life; length of construction period; capital and operating subsidies; equity-debt structure; financing characteristics (*i.e.*, loan maturity and loan grace periods, loan repayment profile); and, relevant discount rates. It is beyond the scope of this Module to detail the intricacies of project finance and financial structures and relevant sensitivities. (For more information see Estache and Strong, 2000.)

1.4 Recent trends

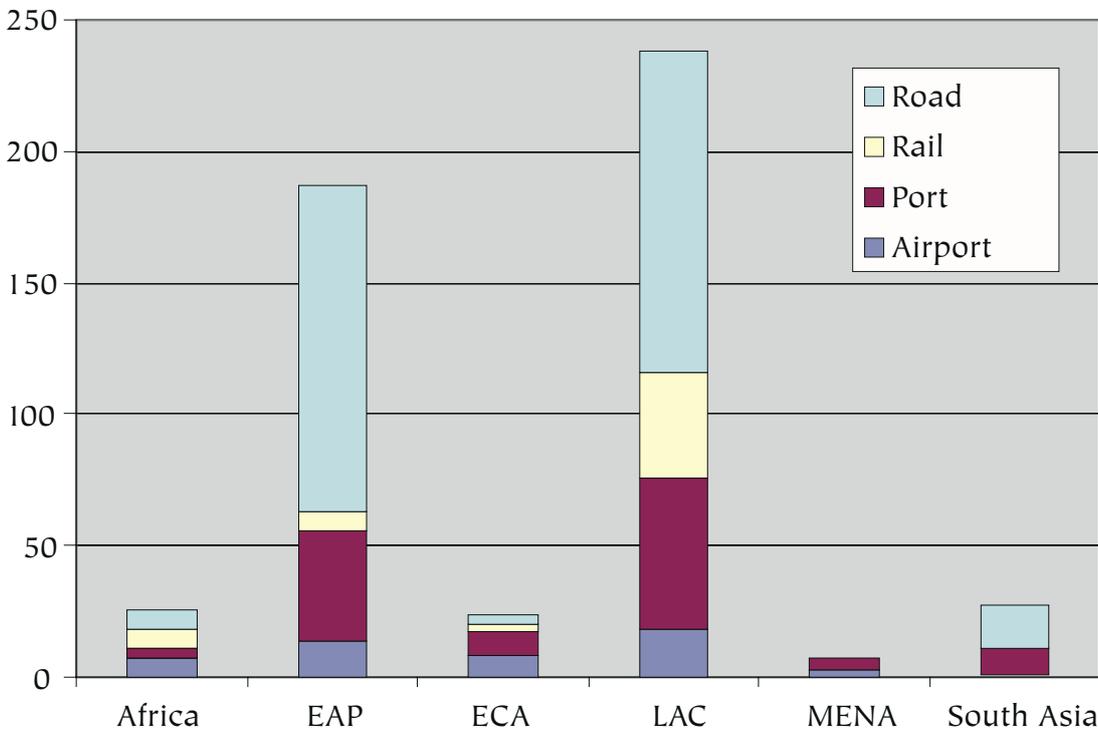
The 1990s saw a large number of transport projects with private sector participation in the developing world – 509, according to the World Bank's Private Participation in Infrastructure (PPI) database (including airport, port, road and rail projects). These projects were heavily concentrated in two regions: nearly half were in Latin America and the Caribbean (LAC) and almost 40% were in

East Asia and the Pacific. From the information available it is not clear how many of these were urban projects. In LAC and Asia (including South Asia), road infrastructure makes up the majority of projects. Rail has also had an important role in LAC (see Figure 2).

During the 1990s, for toll road facilities, operation and management contracts with major capital expenditures accounted for 80% of investments (US\$48 billion for 231 projects). For these projects, the average concession term was 22 years, with private investors bearing all the investment risk in nearly two-thirds of the projects (Silva, 2000). 75% of these projects entailed taking over existing roads (“brownfield” projects); “greenfield” projects have been less common, particularly in the economic conditions of recent years. In Latin America, “brownfield” projects have dominated the road sector, with government support through guarantees common. Many of these projects have still suffered contract renegotiations and other problems. In East Asia, “greenfield” projects account for nearly 70% of the projects, with government participating through equity contribution, loans, guarantees and subsidies.

Most “successful” new roads developed with PSP have been within big cities or connecting big cities, since in this case there is typically less demand uncertainty (Silva, 2000). In the case of urban roads, however, it is important to recall that project “success” should not be measured simply by the signing of the contract, the construction of the facility, and/or the initial positive financial conditions of the project. Unless a project has carefully passed full social, environmental and economic appraisal, as part of a comprehensive strategy for the city, the negative consequences (environmental, land use, community disruption, etc.) of a “successful” urban road concession may outweigh any private benefits. For an example of the recent conflict surrounding an urban road proposal in Chile, see: Engel *et al.*, Web download from References section of this Module, <http://www.itdp.org> and <http://www.ciudadviva.cl/cn.html>.

While specific details on project locations are not entirely available, it seems clear that the majority of transport infrastructure projects being developed through private sector participation are outside of urban areas. Nonetheless, there is significant activity on the urban front. As of mid-1999, Menckhoff and Zegras (1999) identified



Notes: EAP - East Asia/Pacific, ECA - Europe/Central Asia, LAC - Latin America/Caribbean, MENA - Middle East, North Africa

Fig. 2
Transport projects in developing countries with private participation.

World Bank PPI database

at least 25 private urban transport infrastructure concessions in operation in the developing world: 9 in Asia and 16 in Latin America (including Buenos Aires). These operational projects imply some US\$8 billion in capital investments, much of which has been financed by the private sector, with the private concessionaires also acquiring a significant portion of the operating risks. They identified at least another 25 private sector projects that were under construction (Menckhoff & Zegras, 1999).

“In the case of urban roads, project “success” should not be measured simply by the signing of the contract, the construction of the facility, or the initial positive financial conditions.”

As of 2000, the ADB identifies 12 BOT urban road projects in operation in Asia (excluding China, but including Hong Kong) and an additional 19 under construction and 21 in the planning stages. Both Hong Kong and Thailand each have four projects operating, while Malaysia apparently has the most aggressive near-term plans, with 7 projects under construction and 8 in the planning or pre-planning stages (see Table 3).

Towards the end of the 1990s, concession activity was hampered significantly by declining worldwide economic activity. Private investment in toll roads provides some indication of this trend—projects reaching financial closure declined from 56 projects (valued at US\$10 billion) in 1997 to 12 projects valued at US\$1.8

billion in 1999 (Silva, 2000). East Asia was the hardest hit, as toll road projects with private participation went down from US\$6.6 billion in 1996 to US\$312 million in 1999.

The early 2000s have seen a noticeable slowdown in the use of private sector concessions for transportation infrastructure, at least in Latin America (Guasch *et al.*, 2005; Bull, 2004). The slowdown may be due to the fact that the obvious “best” projects have been taken; but is also partly attributable to the slower-than-expected pace of advancement of planned projects as well as frequent conflicts (*e.g.*, over contracts) over existing concessions. This latter point is in part reflected in the high degree of contract renegotiations (Guasch *et al.*, 2005). Interest in the mechanism is still strong, particularly on behalf of the private sector financiers and developers, but expectations are somewhat reduced. A large number of “mixed” concessions have emerged, particularly for public transportation infrastructure. In fact, in many cases, these cannot really be accurately called “infrastructure” concessions as often the contract is only for rail operations, sometimes with some maintenance responsibilities.

Table 3: Urban road projects with private sector participation in Asia

	Open	Construction	Planning	Pre-Planning	Abandoned	Total
Bangladesh			1			1
Hong Kong	4	1				5
India			3			3
Indonesia	2	5	3	1		11
Malaysia	2	7	4	4		17
Philippines		2	7			9
Sri Lanka			1			1
Thailand	4	4	2		2	12
Total	12	19	21	5	2	59

ADB, 2000

2. Experience with PSP in urban transport*

Much of this section is reproduced from Menckhoff & Zegras (1999), with some modifications and updates.

The history of private participation in urban transportation infrastructure development is not new. Most early public transport systems in the United States were built by the private sector, under various forms of municipal charter or franchise, with revenues coming from fares and land development. The more capital intensive rapid transit systems were built with public monies, with long concessions granted to private operators (see below); monopoly rights were exchanged for long-term fixed fares. Inflation, political manipulation of fare increases, and competition from the automobile strained most private systems, leading most towards insolvency and a subsequent shift towards public ownership by the 1940s (for more detail, see Menckhoff & Zegras, 1999).

The more recent history of private participation in urban transport infrastructure can be traced back to Hong Kong's Central Harbour Crossing, a BOT road tunnel opened in 1972 (see Table 3). Hong Kong continued at the forefront of urban transport infrastructure concessions, using the mechanism to deliver two other tunnels during the 1980s, and a fourth in 1997. Hong Kong used DBO and DBFO in situations that required innovative integration of design, construction, finance and long-term operation (Miller, 2000). The use of concessions quickly spread to Thailand, Malaysia and the Philippines. By the early 1990s, many regions of the world had some demonstrated experience with infrastructure concessions in the urban transport sector. The following sections detail some specific experiences from both the road and the public transport sectors.

2.1 Road sector

2.1.1 Buenos Aires, Argentina

The Argentine move towards road concessions had its roots in 1967 legislation allowing toll financing of new bridges, tunnels and highways to be carried out by the National Highway Department. In the face of strong opposition to these tolls by users, the program proved a



failure, forcing the government to revert to traditional public works financing schemes. In 1976, another toll road push was undertaken, this time with efforts to explicitly include the private sector. Five of the six projects proposed under this initiative were for the Buenos Aires metropolitan area, but none were ultimately successful private sector enterprises (Figure 3). Two of these concessions were bought by the city government due to lower than forecast traffic volumes, a third—the 9 de Julio Motorway—was revoked and partially completed by the city, a fourth was built completely by the public sector, and a fifth—the Buenos Aires, La Plata (BALP) Motorway—was delayed for many years due to lack of public financing. The City Government signed a new contract for the completion of the 9 de Julio Motorway with the original concessionaire in 1993.

Concessioning process

By the end of the 1980s, the government fiscal crisis and the deteriorating state of road infrastructure led to a new initiative, which would allow for the concession of new and existing road infrastructure. As a response, a group of Argentine construction firms submitted a proposal to the government for the construction, extension, rehabilitation, and maintenance of a network of motorway accesses to the city. (The BALP motorway was not included as it was still under

Fig. 3
Elevated roads in the Buenos Aires city centre area, such as the Ezeiza Motorway pictured here over San Juan subway station, were not successful private sector enterprises.

Karl Fjellstrom, Feb. 2002

its 1981 concession, although not complete.) The government awarded the group the concession without any competitive bidding, but the award was cancelled due to public opposition both to the toll roads program and the lack of toll-free alternatives. The Ministry of the Economy and Public Works and Services (MEySOP) then established a special concessions unit, unbundled the projects in the access network proposal, added the BALP Motorway, and opened up another bidding process. Except for the BALP, the projects to be concessioned—the Northern Access, Ricchieri Motorway, and the Western Access—each incorporated existing highways.

The call for bids took place in January 1993 and contracts were signed in July 1994. Winning bidders were selected according to the lowest bid toll (the state set a maximum toll in the invitations to bid, based on the minimum balance between the average user benefit and that which would provide a “reasonable” return to the concessionaire). The concession term was set at 22 years 8 months after which time the state would assume control of the facility, according to established standards (with concessionaires required to set aside security funds to ensure that the standards are met). This concession term was later revised and set at 20 years from the initiation of toll collection. The initial contracts specified that tolls could not be collected until the completion of works, which in turn had to occur within the first two years of the concessions. In some cases, this requirement was waived in subsequent contract modifications.

Experience after initiation of toll collection

As of 1999, the Northern Access had proven to be the most successful in terms of meeting demand expectations; indeed in terms of paying traffic the highway is the largest operating toll road in the country, with 334,000 paying vehicle equivalents per day in December 1998. The use of automated toll collection (ATC) technology is currently estimated at 35%, but—except for the Camino del Buen Ayre Northern to Western Access link—the system is not compatible with others being used in Metropolitan Buenos Aires. The concessionaire is also implementing variable message signs as part of an intelligent transportation system (ITS)

program. Another innovation of the Northern Access has been the recent receipt of US\$40 million in prepaid royalties for commercial use of service areas. Of the other concessions under the national government jurisdiction in Buenos Aires, operational experiences have been less successful. Traffic volumes on the Western Access and BALP are lower than bid estimates, by 10% and 40% respectively. The BALP continues to be plagued by delays in infrastructure development, principally due to disagreements between the national and local governments on the highway alignment through the city (Nicolini, 2001). Overall, in 2000 the four fully operating accesses to Buenos Aires collected US\$290 million, half of which was collected by the Northern Access (Nicolini, 2001). Although detailed financial information on the various accesses was not readily available, the Northern Access had been reporting profits up through 1999 (Ghisolfo, 2001). Ghisolfo also estimates that the project provides high net social benefits (a 31% economic rate of return). More recent information on the financial and operational performance of these facilities was not available.

Negotiations and contract modifications

Negotiations on and modifications to the initial contracts were required as the works progressed, either to add new works or to change the original terms. The original agreement for the Northern Access has been amended five times since 1996, principally to account for changes in demand since traffic has increased 30%, despite economic slowdown (Nicolini, 2001). For both the Western Access and the Ricchieri Motorway, the negotiations stemmed from delays due to expropriations (in the case of the Western Access, a toll increase was also allowed due to delay-related cost increases). Although some degree of flexibility has been critical given the unpredictability of land acquisition and resettlement issues, the government has mitigated business risk, which may send signals to concessionaires causing them to underbid. Indeed, the most recently awarded concession contract, for the President Perón ring road, explicitly contemplates renegotiations and toll adjustments. This clear offsetting of risk may have led to the winning concessionaire submitting a toll bid nearly 40% below the government maximum.

Regulatory and legal context

At the time of the award of the concessions, the government set up OCRABA (*Organo de Control de la Red de Accesos a Buenos Aires*, or Buenos Aires Access Network Control Agency), as a relatively autonomous regulatory unit dependent on the Public Works Secretary of the MEySOP. OCRABA is financed via a “rounding up” of tolls collected. OCRABA’s annual operating budget is approximately US\$4.5 million (Ghisolfo, 2001). Its powers are essentially limited to monitoring compliance with the agreements and imposing sanctions; responsibility for major contractual changes, however, rests with the Public Works Secretary. As of 2001, OCRABA was restructured to be in charge of all toll road facilities in the nation and renamed OCCV (*Organo de Control de la Concesiones Viales*, Road Concessions Control Agency).

The basic legal framework stipulates that the average toll on the facilities cannot exceed the average economic benefit of the service offered. Potential toll increases are limited to the percentage change in the U.S. inflation rate, as measured by the Consumer Price Index (CPI). One challenge to enforcing the regulation on the toll level stems from the difficulty in actually measuring economic benefit (the method is not specified in the contracts)—although some suggest that user benefit calculations have been positive since 1994 (see Nicolini, 2001; Ghisolfo, 2001). A further challenge comes from the fact that economic benefit is not necessarily linked directly to the CPI-based toll increases specified in the contracts (FIEL, 1999). In the case of the Northern Access, although the U.S. inflation has exceeded that in Argentina, the concessionaire has not fully raised the toll (Ghisolfo, 2001). Another important legal feature is the requirement that additional revenues from traffic levels exceeding those in the offers be reinvested in the facilities. This stipulation creates the unfortunate incentive for the bidder to over-estimate traffic projections; in addition it creates potential challenges in terms of monitoring routine operations and costs and ultimately enforcing the investment plans. A final important point to note is that not only is the Buenos Aires Access Network regulated separately from the rail system, but also from the rest of the nation’s road concessions.

According to Nicolini (2000), the highway concessions in Buenos Aires have been subjected to several problems common to concessions. The case of the Northern Access, offers an example of lowballing by the winning bidder—the concessionaire raised the toll above the competing firm’s bid toll soon after the initial award. The BALP was subjected to inflated construction, operation, administration and maintenance costs, which the concessionaire reportedly has used to renegotiate more favourable concession conditions. Nicolini (2000) claims that inflating costs is a common practice—indeed, is built into the system—of all highway bids and contract renegotiations in Argentina.

Comments and conclusions

Due to a strong and consistent government policy, relatively simple and transparent bidding processes, good entrepreneurial response, and a stable currency, the Buenos Aires concessions are possibly most noteworthy for their rapid speed of implementation. In the latter half of the 1990s, the government attracted over US\$1 billion in private motorway investments. While the initial results are positive, the Buenos Aires experience raises questions regarding:

- the changes needed in the existing concession contracts and the transparency of the renegotiations process;
- the role of regulatory agencies, particularly relating to contract modifications and their effectiveness as guardians of public interest;
- the effects of the concessions on urban growth and sprawl.

Based on his assessment of the Argentinean experience with private toll road development, Nicolini makes several recommendations:

- use competitive bidding with simple and clear bidding documents;
- aim to avoid contract renegotiations (*i.e.*, identify clear thresholds for demand volume triggering expansion);
- better balance the allocation of risk by eliminating the pegging of tolls to the US CPI, having the concessionaire handle revenues handled by concessionaire, using adequate pre-qualification and screening of bidders, independent international auditing of renegotiations, explicitly prohibiting contract extensions;

- design a long term, stable institutional and legal framework, with technical assistance and capacity building for the regulatory body;
- develop an integrated toll and investment network policy;
- utilise continuous competitive bidding for additional works;
- incorporate telematics technologies and utilise congestion pricing;
- focus on performance quality during operations;
- develop a user orientation (information provision, participation, formal avenues for user complaints).

Possibly the main criticism of the roadway concession process was the fact that it occurred within an urban planning vacuum. According to an Argentine colleague, the planning of transport infrastructure (based on social, economic, environmental, and urban development criteria) is being replaced by financial market forces with their perhaps accidental effects on physical development. There has been some recognition of the negative impacts of some of the roadway concessions (such as the “barrier effect, see: <http://www.buenosaires2010.org.ar/biblioteca/docstrabajo/TallerForotrans.pdf>), yet—as in most places around the world—there appears to be no consensus on the desired future metropolitan form for Buenos Aires and the role of transport in influencing that form. Similar to other cities of the developing world, Buenos Aires, according to the Coordinator of the city’s Strategic Plan, has two potential paths for development: continuous and uncoordinated urban expansion, growing auto dependency, with high social and spatial segregation; or, a more integrated and compact city, with multiple sub-centers, community identity and a greater share of public transport and pedestrian trips (see: <http://www.buenosaires2010.org.ar/vision2010/visiontran.html>). There is the distinct likelihood that the road concession program may be leading the city towards the former, auto dependent, model.

Nevertheless, it is fair to say that most things were “done right” in the initial round of concessions. Many of the problems which are now apparent only became obvious with hindsight. Others (such as the absence of an overall transport plan for the city) were known at the time, but their solution would have delayed—and

possibly altogether stopped—the concessioning process. Efforts are now underway to establish a coherent transport planning process for Greater Buenos Aires. This process, and the health of the concessions are, however, now subject to the serious constraints imposed by the ongoing economic crisis which has produced visible declines in the city’s road traffic (a 20% decline in inner-city highway traffic from 2001–2002 and a 35% decline in demand for private parking garage spaces: GTZ, 2002).

2.1.2 Bangkok

Bangkok, known for its traffic congestion, has attempted to solve its transportation woes through the construction of several “megaprojects.” Bangkok has also increasingly been turning to the private sector as a source of financing for these megaprojects. Indeed, the authors of the nation’s *Seventh Plan Urban and Regional Transport* (SPURT), published in 1991, considered the use of concessions to be “further developed in Thailand, and notably in Bangkok’s transport sector than in most other places.”

When the Royal Government of Thailand started considering concessions for improving its urban transport infrastructure, a main objective was to “alleviate the investment burden of the Government and to have the private sector participate in the development of the nation’s transportation system.” In the early 1980s, the private sector became to be viewed as a potential financing source for infrastructure investments. A five-year transport plan for Bangkok published in 1985 anticipated approximately 2% of road infrastructure investments to be financed by the private sector (these were initial construction expenses for the Second Stage Expressway).

When SPURT was published, the initial forays into private concessions contained in the 1985 plan had grown into six megaprojects to be financed via concessions—valued in 1991 at nearly US\$8 billion, or more than 60% of all transport infrastructure investments planned for the city during the period 1992–1996. At the time there were four different government agencies leading the various concessions: the Dept. of Highways (DOH), the Bangkok Metropolitan Administration (BMA), the Expressway and Rapid Transit Authority (ETA), and the State Railways of Thailand (SRT).

By 1999 only two of the road projects in SPURT had opened or were close to opening: the Don Muang and Second Stage Expressways. An additional concessioned motorway, the Bang Pa In – Pak Kret expressway which was not identified as part of the SPURT report, also opened towards the end of 1998.

Most of the originally planned concessions were intended to be financed in part by user fees with additional revenues coming from real estate development and/or government subsidies in the form of toll revenues from existing expressways, land acquisition and preparation, tax exemptions, and guarantees. Based on the initial concession plans, SPURT attempted a preliminary assessment of the “success” of the concession policy, based on several criteria. The authors did not, at the time, draw overall conclusions regarding the concessions, but their early observations proved to be somewhat prescient. While noting the potential promise to attract more capital to the sector, the SPURT report raises several concerns including: the apparently slow pace of projects moving forward; the potential for the concessions to wind up dictating the public investment budget and the overall transport strategy; possible macroeconomic instability arising from the high levels of foreign investment; and a variety of potential risks stemming from contractual issues and government liability. SPURT further pointed out that the government lacked an effective system of project development, resulting in sometimes incompatible projects, few bids (little competition), uncertainty about the government’s ability to deliver, land acquisition problems, unidentified public costs due to the need for project integration, and contingent liability of the government, among others.

Eight years after the publication of SPURT, we see a Bangkok that is in many ways different, but also very much the same. While the economic crisis of 1997–1998 may have at least brought temporary moderate relief to its severe congestion, the fundamental challenges to the city’s transport system remain: institutional coordination and effectively balancing transportation demand with supply. The overall transport strategy that continues to dominate the region still revolves around the megaprojects. Indeed,

the megaprojects program has apparently expanded further, especially with regard to expressways. Completion of all projects currently under construction would yield a rail rapid transit network of 45 km and an expressway network of some 355 km (World Bank, 1999). Furthermore, an additional US\$30 billion in approved projects are in the planning stage, although only about US\$1 billion in funding for these projects is apparently available (World Bank, 1999).

Interestingly, while authorities continue to embrace the megaproject approach in Bangkok, the use of concessions has apparently waned. The three concession expressways (Don Muang, Second Stage, and Bang Pa In – Pak Kret) are either complete or almost complete and only one major additional urban road concession is currently planned: the South segment of the Outer Ring Road, including a bridge over the Chao Phraya River (estimated cost of US\$1.04 billion).

Why, after an aggressive early start on using concessions in the urban transport sector, has Bangkok seemingly cooled to the approach?

Problems in at least five areas can be identified:

- political intervention;
- the absence of an adequate policy framework for the concessions;
- institutional problems among competing agencies;
- failure to integrate the various projects with each other and absence of an overall transport plan; and
- the financial crisis of 1997–1998.



Bangkok’s Skytrain provides high quality transit, though ridership has been disappointing and costs high. The system is being expanded with a 2.2km section to open in 2004, and bidding in 2003 for construction of a further 8.9km section.

Karl Fjellstrom, 2002



In the case of the Second Stage Expressway, for example, the government prevented the original (foreign) concessionaire from implementing a contractual toll increase and from collecting its share of the First Expressway toll revenues; the company eventually sold its interest to local companies, after which the toll increases were allowed. The Don Muang expressway also suffered from the government's failure to uphold contractual obligations regarding the demolition of competing infrastructure. Most recently, the Pak Kret – Bang Pa In concessionaire closed the highway during a dispute with the government which attempted to force it to offer toll discounts during the Asian Games (World Bank, 1999). In this context, the inevitable politicisation of the process raises important issues of risk allocation. Evidence suggests that the private sector cannot avoid carrying some of the financial risk of revenue losses due to political intervention (World Bank, 1999).

These problems stem from one of the primary concerns that SPURT had initially identified regarding the concessions process: insufficient institutional capacity and policy framework. Beyond presenting eventual problems related to toll setting and other contractual issues, the lack of an appropriate institutional and policy context can result in—as in the case of Hopewell—premature commitment to a specific project promoter, without confirming project design and feasibility (World Bank, 1999). In addition, problems inherent to urban transport infrastructure projects—such as securing land and dealing with environmental impacts—are only compounded without adequate institutional capacity. Finally, the political backlash related to toll and fare setting may be linked to the initial, non-participatory approval process.

Further complications have almost certainly arisen from the fact that five different government agencies are currently involved in transport infrastructure concessions in Bangkok. These multiple agencies have, in turn, contributed to project overlap and competition and a lack of integration. This lack of integration manifests itself at three levels:

1. long-term strategic planning consistency;
2. initial design of specific infrastructure (links, accesses/egresses); and

3. traffic management policy. Regarding traffic management policy, there are cases (*i.e.*, Don Muang) of traffic management schemes significantly improving traffic flows on competing, non-tolled infrastructure, with direct, negative effects on toll revenues.

The lack of project and policy integration is not a problem, as such, of the concessions, but rather an example of the need for an overall urban transport strategy. It is possible that such a strategy was impossible to achieve, since different parts of the government were competing for slices of the concession pie. In other words, the concessions may have actually hindered coherent planning. Indeed, the 1991 SPURT report itself was not really a “plan,” but rather a compilation of ongoing projects that were being promoted by different government agencies. Not only was effective planning hampered, but now there is the real concern that the existence of these concessions (and the commercial interests behind them), without a strong urban transport policy, might unduly influence implementation of other transport projects and policies in Bangkok, such as exclusive busways and/or congestion pricing. Neither busways nor congestion pricing seem to be high on the government's list of priorities, despite past successful experiences with exclusive bus lanes and the fact that congestion pricing had been planned for Bangkok as long as 20 years ago. The existence of the concessions and other toll roads could, in theory, help move forward a congestion pricing, at least on limited access roads.

It is likely that the Asian financial crisis in 1997–1998 has played an important role in slowing Bangkok's concessions. Private concessionaires have been affected by unfavourable debt market conditions and the depressed domestic stock market (a former incentive to concession companies was the possibility to profit from public stock offerings).

Conclusions

In 1991, Bangkok was considered to be among the most advanced cities in terms of transport infrastructure concessions. As a testimony, over the past decade, concessions have been able to attract private sector funds to transport infrastructure in the city; of all the megaprojects either opened or under construction, concessions

have produced 84 km of roads and rail lines (20% of megaproject route-km) and US\$2.9 billion in investments (almost 50% of total megaproject investments to-date). Unfortunately, the timing of these projects has been relatively slow due to contractual and legal issues as well as problems with some projects' basic designs.

The Bangkok experience raises important questions regarding the viability of this urban transport infrastructure delivery mechanism in Thailand and perhaps provides an indication of why the initial heavy emphasis on private concessions has seemingly tapered off within the megaproject strategy. The problems that Bangkok has faced derive primarily from the absence of an accepted overall urban transport policy and investment program, within which new road/rail concessions might have been defined. Further complications came from the fact that there were so many different agencies pursuing concessions in the metropolitan area.

“The Bangkok experience highlights the lesson that the pursuit of an appropriate urban transport policy and strategy, and not primarily the pursuit of private financing, should shape the context within which concessions occur.”

Beyond the factors described above, it can be argued that Bangkok lost valuable time by searching for private sector support for its rail mass transit. After a quarter century of planning, the first limited BTS lines were only opened in late 1999. In the intervening years which coincided with Bangkok's remarkable economic boom, physical development sprawled seemingly unplanned in all directions, leaving a city for which future transport solutions will be difficult to implement. (In contrast, the Government-driven transport investments of Hong Kong and Singapore have produced a mass transit infrastructure which functions efficiently and has helped to shape urban growth.) The Bangkok experience highlights the lesson that the pursuit of an appropriate urban transport policy and strategy, and not primarily the

pursuit of private financing, should shape the context within which concessions occur. The private sector projects should desirably be situated within an overall strategy and then be implemented in a clearly defined and transparent process (SPURT, 1991; World Bank, 1999).

Due largely to these problems, the future use of concessions in Bangkok's transport sector remains in doubt. By failing to uphold contractual obligations in the case of several projects, the government's credibility is at risk. Multi-agency involvement will continue to pose a serious challenge as will the lack of a clear regulatory structure. (For an analysis of institutional issues in Bangkok, please refer to Module 1b: *Urban Transport Institutions*.)

The city has attracted some US\$3 billion from the private sector to finance a rail transit line and three expressways. In the face of this impressive amount of capital, however, is the reality that most projects have been delayed, while several of the originally planned projects have either been scrapped or face uncertain fates. Furthermore, the evidence seems to suggest that Bangkok, by focusing on concessions, lost valuable time in the development of rail transit. In the meantime, ongoing motorization and the absence of effective mass transit and demand management measures may have contributed to urban sprawl which will make the solution of Bangkok's transport problems all the more difficult. Today, Bangkok remains one of the

Fig. 4
Bangkok has aggressively built elevated roads, including with private sector participation, but in the long run they may actually exacerbate problems of congestion, pollution, and noise.

Karl Fjellstrom, July 2002



world's most notoriously congested cities despite the spate of "megaproject" road building—some via concessions (Figure 4).

2.1.3 Santiago de Chile

The Chilean Congress passed an infrastructure concessions law in 1991. Soon thereafter, the Chilean Ministry of Public Works (MOP)—the empowered public agency—turned to the mechanism as a means for expanding and improving the inter-city highway network, including important tunnels and extensive lengths of the Pan-American Highway (Route 5). The first urban roadway to emerge from the concessions program was the controversial Costanera Norte (CN) Highway in the nation's capital, Santiago—a proposal first made public in 1995. The approximately 40 kilometres urban highway, runs from the upper-income suburban Eastern foothills through the city center to the Western extreme of the metropolis, connecting to the airport, a real estate mega-project (primarily commercial and industrial), and, ultimately, to the Highway to the coast. This project is interesting compared to the Buenos Aires roadway projects because it is, essentially, a "greenfield" concession, comprising completely new infrastructure (although ultimately the concessionaire also took over existing roadways that were "packaged" as part of the CN project).

After being announced publicly, the Costanera Norte highway quickly met with public opposition, including from concerned residents of the central-city areas through which the highway was proposed. Additional concerns were raised by environmental groups and others, including because: the highway was proposed to pass through a portion of Santiago's major urban park; of concerns about induced automobile travel and air pollution and urban sprawl; and, of suggestions that the highway went against the government's stated priorities of promoting public transportation use. While citizens groups raised legal actions, the courts supported MOP's arguments. Nonetheless, partly in reaction to community pressure and opposition, regional environmental authorities ultimately forced MOP to make several changes to the project, most notably to its original alignment. The highway entered into operations in 2005, with an estimated total investment cost of

approximately US\$520 to US\$670 million (Quijada, 2006; Graham, 2004). This range stems in part from inclusion of estimated subsidies by the government (Quijada, 2006) and the fact that precise estimates of the project cost are not readily publicly available. The project attracted significant interest among the international financial community. Most notably, the Inter-American Development Bank (IDB) provided a US\$75 million credit guaranty for the project, for which the CN was named "Latin American Transport Deal of the Year" in 2003, by *Project Finance Magazine* (Graham, 2004). The IDB's support, together with government minimum revenue guarantees helped produce an AAA bond rating for the issuance. The minimum revenue guarantee was provided to the concessionaire in return for a 50–50 revenue sharing with the government for traffic revenues which exceed forecasts (Graham, 2004).

Despite the opposition generated and the practical difficulties with its flagship urban highway project—the Costanera Norte (the multiple delays of which implied payments by MOP to the concessionaire)—MOP's urban highway concession plans for Santiago continued and, indeed, accelerated. Major upgrades to the portion of the Pan-American Highway running through Santiago—as well as a parallel roadway—were concessioned in 2000, comprising a total of 60 km of highway and nearly US\$500 million in private sector investment. The Northern and Southern pieces of Santiago's Ring Road, Americo Vespucio, were also bid out to concession, in 2001, totaling more than 50 kilometres of urban highway and almost US\$500 million in investments. More recently, construction has begun on a concession for a 22 kilometres highway connecting the rapidly growing northern suburbs and a 4 kilometres tunnel running, again, through Santiago's main urban park—connecting the Costanera Norte with the Northern part of the upgraded Ring Road. Furthermore, a new Southern Access to the city, with at least 11 kilometres running through existing urbanized areas is also under development, forming part of the concession of the Pan American Highway. The Southern Access, running through lower income areas of Santiago, also met with considerable community opposition and project delays. In all, San-

tiago has over 200 kilometres of concessioned highways under construction or in advanced planning stages, signifying private sector investments on the order of US\$1.7 billion (MOP, 2006). Upon completion, virtually all limited access highways in the Metropolitan area will be private sector concessions.

Problems with the Urban Highway Concessions Program

The Chilean highway concessions program, including its aggressive use of the instrument in the city of Santiago, has been widely heralded as a success, not only by the government, but also by many international actors interested in private sector transportation infrastructure delivery. In some respects, the Chilean concession program provides a good precedent; for example, to date all concessions have been bid competitively and open to international competition. At the same time, however, the Chilean concession program is not without its problems, which are particularly exemplified in the Santiago urban highway concessions. Quite simply, the infrastructure concessions program—housed within the Ministry of Public Works—has virtually taken on a life of its own. The responsible entity within the Ministry of Public Works (MOP)—the General Coordinator for Concessions—operates in virtual isolation from the traditionally responsible transportation planning authorities. With the goal of developing and delivering concessions, the General Coordinator carries the resources and political weight of the powerful Ministry, and the influence of the private sector rhetoric, in its favor. As such, the roadway concession projects in Santiago have proceeded nearly independent of the regular planning and project/program evaluation procedures in place in Chile—procedures which, on the books anyway, are among the most rigorous. The turn to private sector concessions have, effectively, provided interested authorities with a bypass of traditional planning procedures. In the case of environmental impact analyses, MOP has in several cases managed to avoid requirements by arguing that the concessioned road infrastructures were not “highways,” an interpretation which was recently judged incorrect by legal authorities (Contraloría General, 2006). This may lead to a series of ex-post project environmental impact assessments.

As would be expected, then, for an agency whose purpose is to build infrastructure, and for the concession program whose success is gauged by the amount of private sector investments secured, MOP has focused on developing concessions. Not only have these been developed in parallel to, and in isolation of, traditional planning approaches, but they have come at the expense of adequate safeguards in place. For example, regulatory oversight has been an afterthought. In fact, only recently have there been public calls for—and MOP public acceptance of the need for—an independent regulatory agency. MOP, itself, according to Engel *et al.*, (2003a), has been lax in enforcing the concession projects. For example, MOP has not put into place independent audits of usage levels for enforcement purposes, instead depending on concessionaire-provided traffic counts. Furthermore, MOP has engaged in several contract renegotiations, with no explanation of the details (Engel *et al.*, 2003a; Quijada, 2006); lack of transparency was a major complaint of the organizations opposed to the Costanara Norte. The MOP’s original inclination towards secrecy has intensified since the CN experience. Instead of opening up earlier in the process due to the long-drawn delays experienced in the original CN, MOP’s response has been to further close its doors and pursue new concessions with even less openness to the public. Quijada (2006) suggests that the concessions have given the government an excuse to be less transparent, claiming private sector confidentiality when confronted with requests for information.

It appears that, in the Santiago case, the development of roadway concessions in isolation from broader urban transportation policy and programmatic strategy has also not yet improved the possibilities for implementing congestion pricing in the city. One possible ancillary benefit of urban highway concessions is that they introduce urban tolls via electronic tolling, which could ultimately make for a fairly easy transition into wider congestion pricing. In other words, by making the electronic payment for highway use a mundane affair, highway concessions can make the next step towards congestion pricing more politically feasible. In this, however, the Costanera Highway has been a disappointment to date, as the recent efforts

to implement “saturation fees” into the toll structure have met with considerable public opposition. Most of the opposition involves complaints regarding higher tolls only enriching the concessionaire. Again, contractual, regulatory, and ultimately more broadly strategic problems (including issues such as discrete highway access bottleneck points) underlie this problem. For example, the contract structure could have been designed such that congestion fees (above a certain rate) would go towards a general urban transportation improvement fund.

Irrespective of the future of the Santiago program, its results—like the Buenos Aires case outlined above—mark an indubitable watershed in the city’s history. Proponents claim that the highways will transform the city for the better, improving quality of life, enhancing connectivity and bringing “modernization,” while opponents criticize the paradigm of promoting auto-dependence, destroying urban aesthetics, and further fueling sprawl. The program certainly marks the entrance of the metropolitan area into an era of highway-orientation, a path from which it will be difficult to veer in the future.

2.2 Public transport sector

Despite its predominance in providing for the travel needs for the majority of people in most cities of the developing world, public transport has generally not seen as much use of concessions for infrastructure provision as roadways. While the private sector plays a major role in providing public transport services (*i.e.*, through bus and minibus operations), infrastructure development has largely remained in the hands of the public sector.

2.2.1 Asia

Since the late 90s, Asia’s concessioned public transport infrastructure projects have met with varying degrees of success. Bangkok, Manila and Kuala Lumpur have utilized PSP to implement mass rapid transit projects using a variety of technologies: metro, light rail and even monorail. Yet, poorly conceived projects, undefined concession processes and operating standards, as well as political infighting have contributed to mixed results (Halcrow Group, 2004). Kuala Lumpur, for example, was forced to take back two of its three concessioned rapid

transit projects (the PUTRA and STAR systems) after only three years of operation, while Bangkok is attempting to buy back its concessions for the Skytrain and Blue Line.

Bangkok

BTS Skytrain

In Bangkok, the Bangkok Mass Transit System (known as BTS or “Skytrain”) opened in December of 1999 at a cost of roughly US\$1.4 billion. The two-line, elevated system totals 23 km and was built under a 30 year concession contract to a consortium including the technology provider (Siemens) with funding from a German development bank and the World Bank’s private lending arm (IFC), among other sources. Although BTS ridership has increased to roughly 400,000 passengers per weekday (Bholsithi, 2005c), levels have been below those considered financially viable for the concessionaire and debt restructuring has been necessary.

Many complications with the BTS project have arisen due to the lack of a clearly defined concession selection process and contract structure. At the time, the project proponent BTSC offered the most attractive deal to the government, with 100% up front financial investment. Lack of service and fare integration with other transit systems has been an ongoing challenge (Halcrow Group, 2004). Since 2001, expansion of the system, considered vital to maintaining increased ridership, has been stymied by political infighting within the Bangkok municipal government. Only recently has the deadlock between the TRT and Democratic parties been broken, allowing the 2.2 km Taksin extension to go forward. The extension is not without its own problems, however. Recent press reports indicate that BTS has requested that the BMA fund the majority of the extension. In response, the BMA has made any government assistance contingent upon a revenue sharing scheme between the two agencies, a difficult proposal for the concessionaire (Bholsithi, 2006).

Blue Line — Bangkok Metro

The 20 km Blue Line opened in July 2004. Infrastructure for the subway system was funded by the Japan Bank for International Cooperation and other Thai banks, while an equipment, operations and maintenance concession was

granted to Bangkok Metro Public Company Limited (BMCL). Total project cost was estimated at US\$3.1 billion. Coming eight years after the BMA/Skytrain concession, the Mass Rapid Transit Authority of Thailand (MRTA) developed a framework for concessionaire selection, soliciting the assistance of various consultants to prepare the project for bidding and to evaluate bids. In addition, feeder bus service to the Blue Line was coordinated with the Bangkok Mass Transit Authority (Halcrow Group, 2004).

Despite the well-formulated concession selection process, ridership levels have not reached expectations and BMCL reported planned fare hikes for October 2005 (Bholsithi, 2005a). In addition to poor forecasts, ridership growth may have been hampered by a series of debilitating technical malfunctions, derailments, and power failures during early 2005 that prompted warnings from the MRTA to the equipment supplier, Siemens Thailand (Bholsithi, 2005b).

Although there was some indication of legislative reform in 2004 to improve the potential for PSP (Webster & Theeratham, 2004), it is unlikely that new public transport infrastructure concessions will come to fruition in Bangkok's future. The MRTA reports that the Ministry of Transport is working to buy back the concessions for both the Skytrain and the Blue Line. Additionally, the agency's announcement to push ahead with the 40 km Purple Line expansion to the Bangkok Metro indicates that it will be a public endeavor (MRTA, 2006), although several international consortia are reportedly preparing proposals for this project.

Manila

Completed in 2000 at a cost of approximately US\$700 million (US\$190 million equity, US\$488 million debt), the MRT3—Metrostar Express line was created through a Build-Lease-Transfer (BLT) concession with a consortium of Filipino developers, the MRT3 Project Company. The company has a 25-year contract to finance, construct and maintain the project and can implement commercial developments for 50 years. The government operates the service, which runs light rail vehicles (Czech-made streetcars) along the 17 km grade-separated right-of-way (Halcrow Group, 2004). Average

daily ridership on the system was 363,000 in December 2005 (Philippine Department of Transportation and Communications, 2006).

According to an analysis for the World Bank, the MRT3 project was considered successful, based on the criteria of ridership levels, infrastructure delivery, and return to the concessionaire. However, the contract requires the government to pay a guaranteed fixed revenue stream to the concessionaire (which also benefits from property rent possibilities), independent of operating revenue. All operating risk is therefore transferred to the government, which has been faced with US\$30 million to US\$60 million in unexpected yearly payments to the concessionaire due to shortfalls in forecast revenues (Halcrow Group 2004). Apparently, these shortfalls are not due to ridership, per se, but rather lower-than-expected fares (naturally, fare increases would likely impact ridership levels).

In contrast to the MRT3 project, Manila's subsequent rail endeavor, the 14 km MRT2 line (also known as the Purple Line or Megatren), was undertaken by the government itself after attempts to generate interest in the private sector failed (Halcrow Group, 2004). The full line was completed in October 2004 and has achieved only moderate ridership levels as compared to the MRT3 system. Despite government's inability to concession an infrastructure contract, the Light Rail Transit Authority of Manila (LRTA) announced in March 2006 the tender of a 5-year maintenance and operations concession for the MRT2 line (LRTA, 2006).

System coordination is a government priority, evidenced by the national Strong Republic Transit System (SRTS) program, designed to create a seamless rail network in Manila by integrating the various rail systems and their fare structures. Already implemented as part of SRTS, the Flash Pass Ticketing System enables riders to purchase fare media accepted on all rail lines. Physical integration of the systems will be achieved through the construction of seven interchange facilities, which will allow for transfers between rail lines at key connection points (LRTA, 2006).

2.2.2 Brazil

Brazil's first efforts to turn to the private sector for financing urban public transport

infrastructure were initiated by the São Paulo Municipal Government in 1995, with a goal of reducing the subsidies required to operate a publicly-owned bus system and to produce an extensive network (241 km) of exclusive bus corridors. The concessionaire was to retain responsibility for designing, building, and maintaining the infrastructure and for operating 1,056 buses under an eight-year term. The bids were evaluated on technical and price proposals; for firms that passed the technical evaluation, the final awards were based on the lowest Net Present Value (NPV) of the proposed investment costs. Although contracts were awarded, none of the concessions have moved forward due to lack of financing. Among the lessons this experience offers: for such an innovative proposal, financing can prove difficult and costly to achieve (high perceived risk), if adequate guarantees are not in place (Rebelo and Benvenuto, 1995; 1997).

Around the same time that the Municipal Government was attempting to concession its proposed busway network, the São Paulo State Government decided to concession the São Mateus-Jabaquara busway, which had been originally brought into service in 1987. The state busway had been designed as an electric trolleybus corridor, but costs precluded the complete development of the trolleybus line. The goals of the concession were to reduce the state's involvement in public transport operations, reduce the state's costs of service management, and to complete the electrification of the 33 km corridor. A three-stage bid evaluation was used; those consortia which passed the pre-qualification and technical proposals, were then evaluated according to price, with the award going to the bidder who offered the highest gross revenues to the state over the 20-year concession. Operations were initiated in May 1997. This concession benefited from the fact that much of the infrastructure was already in place, which gave the bidders immediate access to revenues and thus a reduced borrowing burden; moreover, the concession period was long enough to allow full amortization of the trolleybuses (Rebelo and Benvenuto, 1995; 1997).

The line, operated by the company Metra, basically functions as an operations concession,

with the main difference from a typical bus operations concession (typical to many Latin American countries, including Brazil) being the trolleybus function. Still, less than half of the operating fleet is electric trolleybus, with the remainder still operating diesel vehicles. Few investments (beyond vehicles) are required of the concessionaire, although Metra assumed responsibilities for pavement and terminal maintenance in 2001 (Metra, 2006). Since the concessionaire took over operations in 1997, ridership declined from 6 million per month to 5 million per month by 1999 (Rebelo and Machado, 2000); the concessionaire currently reports an average of 5 million riders per month (Metra, 2006). Rebelo and Machado (2000) attribute this ridership decline to competition from minibuses, a general economic slowdown, and other exogenous factors. Furthermore, they note that the Metra busway experienced lower declines than other public transportation service in São Paulo. According to authority's service quality rankings, Metra ranks roughly in the middle of the 50 ranked companies operating in the São Paulo metropolitan area (EMTU, 2005).

At the end of 2004, Brazil enacted a new public-private partnership law aimed at attracting private investors to large scale infrastructure projects. Among other impacts, this law allows the public sector to provide subsidies to the private concessionaire (previously this was not a legal possibility in Brazil) (Franco, 2005). The first project put forward under the new law was the development of Line 4 of the São Paulo Metro. The project is designed as a turnkey, with the government developing and financing the infrastructure—approximately 13 km and 11 stations—at an estimated cost of US\$920 million. The private sector concessionaire will operate the system for 30 years (with responsibility for rolling stock, telecommunications/signaling, and infrastructure maintenance), with an estimated investment of US\$340 million (Metro, 2006; Rebelo, 2006b). The winning bid will be awarded to the company requiring the lowest subsidy from the State. The government had also initially been exploring plans to develop via concession an extension of a suburban rail (CPTM) line to the airport, however the concession plans for this extension were eventually dropped and the project is now

being developed via traditional means (World Bank, 2005; Metro, 2006).

More recent experiences in Brazil have been focused on Rio de Janeiro, where a budgetary crisis exposed the need to reduce state subsidies to the Metro (subway) and commuter rail (Flumitrens). This need, combined with the desire to improve services and reduce maintenance and investment backlogs led the State of Rio de Janeiro to the decision to concession both systems. The 41 kilometres Metro system was concessioned in December 1997 to a consortium including Cometrans, the owner of the Mitre and Sarmiento rail concessions in Buenos Aires (see next section). The two-step bidding process entailed pre-qualification (based on experience) and then a cost proposal (NPV of best offer above a set minimum). The proposals ultimately received proved to be higher than what was expected. The Flumitrens concession followed a similar bidding process, benefiting from the Metro experience, and was signed in July 1998. The main positive lessons from the two experiences include the simplicity and transparency of the bidding process which was managed by the Rio Stock Exchange. Among the issues that remain to be resolved are the ongoing problems with redundancy, the challenge of modal integration, risk of predatory pricing by competitors, and the effectiveness of the regulatory agency (Rebelo, 1999a; 1999b).

2.2.3 Santiago de Chile

Recently, Santiago has attempted to apply its aggressive roadway infrastructure concessions approach (discussed above) to public transportation infrastructure, notably elements of its bus priority system as part of the Transantiago plan. The Transantiago Plan utilizes various private participation elements, including for the bus operators (as is typical to Latin America), but also for the financial administrator of the system (including integrated fare operations, smart card technology, remuneration to operators). In terms of bus priority infrastructure, Transantiago has concessioned out the construction and maintenance (over 14 years) of one of the segregated corridors, approximately 11 kilometres of a total of 25 kilometres of planned segregated corridors/lanes as part of Transantiago. The estimated investment cost for the corridor was

US\$80 million (Transantiago, 2006). The concession was awarded based on the least present value of payments requested from the concessionaire. In fact, the concession contract operates under the least present value of revenue (LPVR) model (detailed in Section 3.3), with a semi-flexible concession term; the maximum concession term is 14 years from when the corridor enters into service, but the contract otherwise will end in the month when the present value of revenues received by the concessionaire is equal to or greater than the total income originally proposed in the winning bid. The concessionaire is responsible for payments to the government for administration and enforcement costs and, furthermore, had to reimburse the government for approximately US\$25 million in expropriation costs (*Diario Oficial*, 2006). Note that the concessionaire is responsible only for the infrastructure, not operations of the vehicles, so that the concessionaire is isolated from any demand risk on the corridor (or the system more generally). However, the payments to the concessionaire will come from the Transantiago financial administrator, meaning that system users will ultimately be fully bearing the burden of the infrastructure financing. Other corridors in the Transantiago network are not being developed via concession; further information on the decision to concession this corridor versus the others was not available.

Transantiago is also using the concession instrument for the development of 24 transfer stations as part of the bus priority system. These stations were also bid out according to the lowest total payment requested by the concessionaire. Under the agreement, the concessionaire is responsible for constructing, maintaining, and operating the 24 transfer stations (see Figure 5) that it will build; furthermore, it will assume maintenance responsibility for an additional 11 transfer stations to be built by the government (and which the concessionaire must purchase from the government) (*Diario Oficial*, 2006). The concessionaire is responsible for lighting, signage for users, equipment and other elements within the associated areas. Similar to the corridor concession discussed above, in this case the transfer station concessionaire is responsible for compensating the government for studies, enforcement, and

expropriations. And, again, the concessionaire ultimately does not assume any demand risk, as fixed payments are agreed upon in the contract. From the concessionaire's perspective, they do assume some risk (over which they have little, if any, control) from acquiring the maintenance responsibilities of the government-built transfer stations. It is not entirely clear what the use of the concession instrument is actually "buying" in this case—in terms of improved efficiencies, etc.—nor, why only certain stations were determined appropriate for concession.

2.2.4 Buenos Aires

Along with its aggressive highway infrastructure concessions discussed in the previous section, Buenos Aires also embarked on public transport infrastructure concession process that included upgrading the subway and about 840 km of suburban railways in the metropolitan region, as part of packages that included some US\$1.37 billion in investments.

Since the 1950s, the suburban railways had been run by Ferrocarriles Argentinos (FA), the state-owned national railway which by the end of the 1980s was the single largest drain on the national treasury, consuming an estimated US\$800 million to US\$1.4 billion annually. Almost 20% of this amount went towards covering the operating deficit for Buenos Aires suburban rail services. In addition, the subway required an estimated US\$40 million per year in operating subsidies (FIEL, 1999). This financial and service crisis precipitated a sharp decline in patronage; both subway and suburban

rail use decreased throughout the 1980s and early 1990s leading to privatisation in 1993–94.

Ridership levels were impacted yet again as the Argentine financial crisis began to take shape in 1999 and dropped even more dramatically once the government devalued the Argentine peso in January 2002. Rising costs and shrinking revenue streams jeopardized concessionaires' ability to provide subway and rail operations throughout the Buenos Aires metropolitan area.

Concessioning process

As a response, the government decided to concession Buenos Aires' rail services for renewable 10-year periods, except for the subway and Urquiza line which were given a 20-year term. To facilitate the concessioning, the government grouped the suburban railway services into seven different vertically integrated networks, based on those that had existed before their consolidation in the 1950s. Although the areas directly linked to service operations (platforms, ticket booths, etc.) were to be transferred to the concessionaires, all other real estate—including non-operational areas of terminal stations—were to remain with the government for a separate sale or concession.

The government accepted from the start that public financing would be required to operate passenger rail services and undertake the investments needed to rehabilitate the system. For each corridor the government set both maximum fares and minimum service frequencies. The latter were defined in terms of rail cars per hour for each 24-hour service cycle and for each day of the week. In addition, service quality standards were defined for each corridor, including percentage of on-time trains and percentage of canceled trains. By reaching or surpassing these service standards, concessionaires would be entitled to increased fares beyond authorised levels (an automatic US inflation-adjusted fare increase was also allowed), as a performance incentive. The bid documents also included expectations regarding service aspects such as station cleanliness, maintenance, and personnel behaviour.

The government was to maintain ownership of the rolling stock and infrastructure, all of which would be assigned to the concessionaire. The concessionaire was given full responsibility for all operations activities, ranging from

Fig. 5
Schematic of Transfer Station in Transantiago Plan.
source: <http://www.transantiago.cl>



marketing to maintenance of rolling stock and infrastructure. A key design feature in the concessions was that monthly payments (for both operating subsidies and infrastructure investment funds) were to be made to each concessionaire over the entire term of the concession contracts, whereby the concessionaire had to assume all risks related to both demand levels and construction costs.

The bidding process used a “two envelope” approach: the first envelope contained information on the concessionaire (financial, business and technical capacity); the second envelope contained a business proposal and a financial proposal (amount of operating subsidy/payment and costs of investments). (There was also the option to submit an ‘optional offer’ envelope two, outlining a concessionaire-proposed alternative investment plan, though no bidder exercised this option; FIEL, 1999.) Although the investments to be carried out were specified by the state, the bidders identified the schedule of investments to be made (except in the case of the subway, for which the investment schedule was also specified), with the constraint that no more than 12.5% of total proposed investments could be undertaken in a given year. Bidders also included their own demand forecasts, projected revenues (including from publicity and renting locales), and costs of operation. Winning bids were chosen according to the lowest present value of the sum of the monthly payments required of the government.

Eight different consortia presented bids. Seven of them made bids for more than one line, and four consortia eventually won the seven concessions. Interestingly, bus companies form part of each rail consortium. The government had pre-established that there could not be only one operator for the entire system and that consortia needed to include foreign operating companies to prequalify. In the end the selected concessionaires included the following companies as minority partners: Burlington Northern (US); Transurb Consult (Belgium); Japan Railways Technical Services; and Bay Area Rapid Transit District (San Francisco, US). The contracts left open the possibility for minor modifications to achieve notable service improvements, taking account of equipment conditions and changes in demand.



Operational effects

From a service level and ridership perspective, the railway concessions proved an undeniable success, until the economic crisis hit. Initial ridership increases during the first three to four months of concessions ranged from 12% (San Martín) to 102% (Belgrano Sur), owing in part to improved controls that reduced fare evasion which had reached about 35% of all trips during state operations. These initial improvements continued, providing strong evidence that new users have been attracted to the system (Figure 6). By the end of 1998 ridership increases over 1993 levels ranged from 52% (Urquiza) to 802% (Belgrano Sur). In five of the eight lines, actual ridership levels had been higher than those predicted in the concessionaires’ original bids, with the subway showing the most dramatic difference (FIEL, 1999).

Passenger-kilometres increased by 150%, while train car-kilometres increased by 50%. For suburban rail, absolute punctuality (on-time trains as a proportion of the total number of scheduled trains) was estimated at 96% in 1997 in comparison to 77% in 1993 and 83% in 1986. For the subway, average headways declined from 4 minutes 18 seconds in 1993 to 3 minutes 20 seconds in 1997 (FIEL, 1999).

By 2001, however, the Argentine economic crisis had worsened and the situation of the railways further declined. Ridership on suburban rail services dropped by 25% between 1999 and 2002 (CNRT, 2003), while subway

Fig. 6

San Juan subway station, Buenos Aires. In December 2001 fare collection on average over the 5 subway lines covered less than 80% of operating costs of the subway, a situation which in 2002 has further deteriorated.

Karl Fjellstrom, Feb. 2002

ridership declined 15% during the same period (GTZ, 2002). In October of 2002, the federal government declared a state of emergency for all railway transport, requiring that fares be frozen, that concessionaires provide a program for emergency operations including a list of indispensable capital improvement projects, and that concessionaires immediately terminate plans for any projects not already underway (Secretaría de Transporte, 2002). The state of emergency, as well as government default on concession contracts, further hampered concessionaires' ability to respond to the crisis (Litovsky, 2003).

Service quality diminished severely and, in some instances, safety was neglected. In June 2004, the government revoked the concession for the San Martín line due to both safety concerns and the concessionaire's decision to remove a large portion of its motive power from operation, greatly reducing service on the line (Roa, 2006). The Emergency Operating Railway Management Unit (UGOFE or *Unidad de Gestión Operativa Ferroviaria de Emergencia*), a consortium made up of the Transport Secretary and three other railway concessionaires, was created to operate the San Martín service. Since taking over operations on the San Martín line, UGOFE has not been able to fully correct the safety issues that precipitated dismissal of the original concession. In March 2006, for example, two passengers fell from moving commuter trains that were operating at capacity with open doors. One passenger was killed instantly, the other severely injured (Novillo, 2006).

As Argentina began to emerge from the financial crisis, ridership losses stabilized and even began to grow. At the end of 2005, ridership on suburban railways had increased 6% from their 2002 low. Subway ridership also increased 4% over the same period (CNRT, 2006).

Government subsidies

Regarding effects on government coffers, by the end of the 1990s state subsidies for operations declined to approximately one-third of their 1980s levels. In terms of subsidy per paying passenger, the rates had declined from US\$0.74 (1993) to US\$0.20 (1997). For the subway, the estimated US\$40 million annual subsidy declined steadily over the first years of operation. As outlined in the original concession,

the concessionaire was to have been paying an operating fee to the government by 1999.

In response to the economic crisis, the federal government began subsidizing public rail transport in 2001 with a petroleum tax known as the "tasa sobre el gasoil" (Secretaría de Transporte, 2001). The subsidy was meant to compensate concessionaires for increased operating costs in light of the freeze upon fares (Rebelo, 2006a) and, as of April 2006, remains in place.

In February and March 2006, the federal government announced infrastructure improvement projects for the suburban railways amounting to approximately US\$1.4 billion. Improvements include electrification of the Roca and Belgrano Sur lines, grade separation of portions of the Sarmiento line, new rolling stock for all three lines, new station construction, and new signaling equipment (Gutman, 2006; Rossi, 2006). Due to the state of emergency, which is still in effect, these infrastructure projects are being pursued outside of the original concessions.

Although Argentina has emerged from the worst of the crisis, the "tasa sobre el gasoil" subsidy and the announced infrastructure improvements demonstrate an obvious policy shift with regard to concessions within the Argentine government.

Regulation and renegotiation

For the railways, the regulatory task was initially assigned to the National Railway Restructuring Unit (UCPRF or *Unidad Coordinadora del Programa de Reestructuración Ferroviaria*). The UCPRF's duties included all aspects of regulation and enforcement related to fulfilling service levels and safety standards, meeting investment and maintenance plans, overseeing fares and fare adjustments, responding to public complaints, and ensuring that subsidy and payment schedules are met (by state and concessionaires) (FIEL, 1999). In November 1996 the National Commission for Transport Regulation (CNRT) was created, absorbing the duties of the UCPRF. Regulation to-date has been relatively ad hoc and according to FIEL (1999), enforcement has proven to be laborious and bureaucratic. Regarding fare increases, FIEL criticises the adjustment mechanism as being poorly defined and not transparent, although there have not been significant disputes.

Unsafe operating practices on the San Martín line, which have resulted in serious injury and even death, highlight the government's inability to regulate operations, which, in this case involves UGOFE, a government entity. As a result, the National Ombudsman (*Defensoría del Pueblo de la Nación*) has resorted to secretly photographing unsafe conditions on suburban railways in order to pressure the CNRT to action (Sánchez, 2006).

In the case of the railways, negotiations were formally authorised by a government decree issued in June 1997. The authorisation for the railway renegotiations grew from pressures for service expansion, changes in public expectations, the unforeseen need for infrastructure and rolling stock investments and the ensuing need for fare increases to accommodate the higher than expected passenger volumes, and concession term extension. The decree authorised the Transport Secretary (within MEySOP) to specifically renegotiate: scheduled services; investment programs; the concession term; specification of the concessionaires' "operating area" (to improve functionality of stations, entrances, exits); fare structure; state guarantees and payments; allowable financing schemes; and concessionaire membership (FIEL, 1999). In the majority of the cases, the renegotiations are aimed at extending the contracts from 10 to 30 years (with the exception of the subway/Urquiza concession, which is extended from 20 to 24 years), with the principal goal being to get the concessionaires to embark on more ambitious investment plans. This goal is facilitated by a mechanism which now allows the concessionaires to use the rolling stock (which still belongs to the government) as collateral for raising debt. The revised agreements also contemplate staggered fare increases, allowing the extra revenues to be earmarked—together with the operating fees—to investment programs, through a trust fund account. (The trust fund concept was adopted because of the positive experience gained with similar trust funds in the motorway concessioning). Despite the importance of the goals behind the renegotiations, several groups voiced criticism and pointed out that a more transparent and competitive process should have been devised either through re-bidding or by allowing the five remaining concession years to first expire (FIEL, 1999).

3. Recommendations

Concessions offer an important tool in upgrading and expanding urban transport infrastructure as well as improving the services that infrastructure provides. Concessions can improve the delivery efficiencies of both road and rail infrastructure, improve the operating efficiencies of rail systems, attract private capital for infrastructure investments, and get the private sector to absorb at least some construction and operating risks. Even so, experiences to-date indicate that these concessions confront real difficulties. In general, transport sector concessions face multiple challenges, including (UN ESCAP, 2001a):

- failure to understand risk allocation by public/private actors;
- need for new forms of public-private collaborations;
- multiple agency and regulatory hurdles (and potential conflicts of interest);
- legal barriers (including lack of legislation and ill-equipped judiciary system);
- lack of experience in identifying, evaluating and marketing commercially viable projects and in negotiating contracts; and
- lack of regulatory experience.

Furthermore, urban transport concessions, specifically, also face somewhat unique problems related to the political risk regarding fares/tolls increases; challenging environmental, equity, sprawl and resettlement issues; the multiplicity of agencies with some jurisdiction in an urban area; system integration (fare, services, toll collection technology); and the lack of exclusivity (*i.e.*, competing, non-tolled alternatives). While they will likely play an important role in the future of urban transport infrastructure, concessions are not easy to implement and are certainly not a panacea to the present and future infrastructure deficit plaguing many urban areas.

In perhaps the earliest "modern" experiences in this sector, Hong Kong built four tunnels in the last three decades, projects generally considered as successful. In a review of the Hong Kong projects, Miller (2000) attributes this success to three general conditions:

1. **“Good” sponsors** – concessionaires have good knowledge of the local context, are willing to risk a substantial amount of capital early in the project, and have financial strength to overcome expected and unexpected problems.
2. **“Good” project rationale** – the project makes strategic and economic sense, has political support, and has the support of local financial institutions.
3. **“Good” returns** – the project provides financial returns to the concessionaires and the financial investors (at levels higher than more traditional investments).

Miller also highlights the form of competition which took place in Hong Kong—occurring on projects that had been defined in considerable detail (*i.e.*, 10% design stage)—as being important to overall project success.

This section provides an overview of the keys to success of private sector participation in urban transport infrastructure drawing from the recent experiences with this mechanism in the developing world (see Figure 7).

**SECTOR-LEVEL PLANNING PROCESS:
THE URBAN TRANSPORT STRATEGY**

- Identify projects, policies, measures for implementation
- Identify projects with potential for Private Sector Participation



PROJECT-LEVEL PLANNING

- Develop the business case for the concession: financial structure, nature and scope of risks, required government support, risk allocation
- Secure competitive bids: clear project scope, defined government support, simple evaluation criteria, allow proposal flexibility (to encourage innovation), ensure “value for money” (compare with public sector alternative)



PROJECT IMPLEMENTATION

- Construction enforcement
- Operations enforcement
- Ongoing process auditing (for continuous learning)

Fig. 7
Planning and implementing transport infrastructure concessions.
Based on ADB, 2000

3.1 Strategic approach

Urban transport infrastructure concessions should only be pursued as part of a coherent urban transport plan. Concessions must only be a tool for delivering infrastructure that has been proven to be in the “public interest” through a thorough strategic analysis and project evaluation. If investment decisions are devolved to market forces, then we might get the delivery of some major infrastructure (particularly motorways), but we will not get coherent urban transport programs. Project finance can only come after effective, sector-wide strategic planning, including public participation, has identified the most defensible projects. The details of such an approach extend beyond the scope of this chapter, but are contained in other sections of the Sourcebook.

3.2 Institutional, legal, and regulatory framework

The use of private sector concessions aims to reduce the role of government in the physical production and operations of infrastructure assets; nonetheless, the role of the government remains more critical than ever when the choice to employ concessions is made. The government must be a reliable and professionally competent sponsor, defining well the scope of the individual projects (including technical, political, economic, and social/environmental rationale), promoting transparent and head-to-head competition; remaining open to technological innovation; and, importantly, being capable to implement.

Among the most important tasks for the government:

- Determine the need for the infrastructure project (within a strategic plan and through appropriate project evaluation).
- Determine that private sector financing is feasible, desirable.
- Establish legal framework (property rights, contract obligations, security rights, etc.).
- Establish regulatory regime (autonomous, independent).
- Establish bidding mechanism/process (competitive).
- Possibly contribute equity/guarantees.
- Enforce concession terms during construction/operation.

- Ensure proper avenues exist for user group participation, complaints.

A proper legal and regulatory framework will help to convince all parties (the government, the concessionaire, the lenders, the users) of the viability of the concession approach. Regulation is needed to ensure that quality of service does not deteriorate (especially when little competition for the infrastructure service exists), and to make sure that the infrastructure remains well-maintained throughout the life of the contract (especially towards the end of the concession term). An independent regulatory body, free from the strong lobbying power of industry and with well-defined access to the necessary information, is essential. Transparency is of utmost importance in the bidding process, the regulatory process, and during any renegotiations.

A regulatory agency can play at least two roles: either that of simply enforcing existing contracts, or that of also modifying those contracts. In the urban context, where multi-modal concessions (bus, rail, road) are possible, it is not clear whether these should be regulated by the same agency, and whether this should occur at the national, regional, or local level. The question depends, in part, on local capacity and legal contexts. The question also depends on whether one believes that such regulatory power should be united with or separated from an over-arching metropolitan agency responsible for multi-modal transport planning.

Unfortunately, most governments never undertake the measures necessary to establish, *ex-ante*, an effective regulatory body. Engel *et al.*, (2003a) refer to this phenomenon as the “privatize now, regulate later” approach and consider it to be one of the biggest problems with current practice. Guasch (2004) notes the lack of effectively regulatory frameworks causing problems in Mexico and Chile; the Chilean highway case detailed above exemplifies this problem. In Argentina, as mentioned earlier, the regulation of unsafe operating conditions has been left to the National Ombudsman, a social justice agency within the federal government. Obviously this is not an ideal situation. The ombudsman can only investigate improprieties; it lacks the power to enforce change among the public transport concessionaires.

A major challenge to the effective implementation of concessions relates to the relationship between the concessionaire and the regulator. This challenge is linked to the bidding process used, the flexibility of contracts, and any possibilities for renegotiation, as outlined in Engel *et al.*, (undated) in their review of the Chilean transport infrastructure concessions program. As those authors point out, the bidding process should be designed to reduce the likelihood of “opportunistic renegotiations” (*i.e.*, allowing the concessionaire to take advantage of the inherent difficulty in switching suppliers), but at the same time allow for some flexibility (in case the infrastructure needs to be expanded or the fares/tolls should be changed for efficiency reasons, *i.e.*, congestion charges). When changes in the contract terms are necessary, renegotiation (with its attendant challenges) or concession cancellation with fair compensation are the basic options. Neither of these is simple to implement, but Engel *et al.*, (2001) offer a bidding mechanism that can help overcome these challenges, as outlined in the following section.

Some room for renegotiations may well be inevitable, particularly—as in the case of Buenos Aires—when exogenous economic factors come into play. Renegotiations can, in some cases, be good in terms of increasing welfare. But, they can also reduce the ostensible benefits of private concessions. In particular, when concessionaires think that renegotiations will be possible, they may low-ball their bid, under the assumption they can negotiate better terms later (this negotiation is then subject to the strength of legal and financial teams, which will likely favor the concessionaire). In this case, the concession and subsequent renegotiation will produce a net loss to society (Guasch, 2004). In an empirical analysis of renegotiations of infrastructure concessions in Latin America (spanning a range of sectors and countries), Guasch *et al.*, (2005) find *ex-ante* establishment of a regulatory agency—and this agency’s *independence* from the relevant Ministry—to have a downward influence on the chance of renegotiation, as does the quality of the government bureaucracy (as measured by Political Risk Service, International Country Risk Guide). It is important to note that there are differences in some of the apparent causes between renegotiations initiated

by the government versus those initiated by the concessionaire. In Latin America, over the period 1989–2000, approximately 45% of transportation concessions were renegotiated.

3.3 The evaluation process

Simplicity in the evaluation process, while not easy to achieve, can obviate future potential disagreements regarding bidding outcomes as well as project design and operations.

Of course, a lack of true competition during the bid selection process can create challenges for government. Kuala Lumpur, for example, initiated its STAR and PUTRA rail contracts with absolutely no bid process, even asking the PUTRA concessionaire to begin construction before a contract was signed (Halgrow Group, 2004). Three years into both projects, however, poor performance by both concessionaires forced the government to take over the operation of both lines.

Although the temptation to introduce many variables into the evaluation process is great, this can make the process subject to bias on the part of evaluators, reduce transparency, and, ultimately, make the resultant contracts difficult to regulate. It is beyond the scope of this Module to make recommendations about appropriate evaluation mechanisms. However, two approaches deserve mention. The first is the *minimum toll*, in which the government fixes the concession term and the concessionaire offering the lowest toll bid wins—in the case of a tie among bidders, then secondary criteria are used for the award.

The second approach, with less practical applications to date, but arguably more effective for a variety of reasons (for details, see, for example, Engel *et al.*, 2001) is the *least present value of revenue* (LPVR) bid. With LPVR, the regulator sets the user charge and the discount rate and the concession is awarded to the firm that asks for the least present value of revenues. The concession ends when the present value of user fee revenue is equal to the winning bid—in other words, the concession term is variable. For urban road concessions, LPVR offers benefits, because tolls could be varied significantly (to account for congestion changes in time, for example), without adversely impacting the

concessionaire's present value of user fee income (Engel *et al.*, 2001). The LPVR approach still presents several challenges such as the need for strong quality control by the government; in addition, bidders could still underbid projects, since contract rescission would still require an estimation of future costs, which are subject to negotiation and lobbying pressure (Nicolini, 2001). In Chile, home of the intellectual authors of the LPVR model (Engel *et al.*, 2001), only one transport infrastructure concession (an inter-city highway) has been granted with rigorous adherence to this approach (Engel *et al.*, 2003a). Some of the challenges to this approach include: bidders concerns over the complexities of preparing bids, investors reservations about the implicitly fixed rate of return (no rewards for improved operating efficiencies), and financial institutions' discomfort with providing financing mechanisms for inherently variable term concessions (Cruz *et al.*, undated).

3.4 Risks & guarantees

Transport infrastructure projects are fraught with risks throughout their life-cycle. These risks include permitting and land acquisition risks, risks of cost and time overruns during construction, risks of cost overruns during operation and management, demand and revenue risks, inflation and currency risks, among others. How these risks are allocated between the concessionaire and the government has important implications for project selection and project performance. Concessionaires will aim to mitigate these risks through, for example, requesting government guarantees. The problem with many forms of guarantees is that they end up significantly reducing the benefits that the use of concessions aims to realise. For example, the government may offer a demand guarantee, ensuring a yearly level of revenue. Such a guarantee will reduce the purpose of using concessions to filter out “white elephant” projects. The renegotiation process (as exemplified in the Buenos Aires case above) offers a similar end result (the concessionaire can negotiate out of a losing situation), but introduces further problems, such as firms purposely under-bidding with the knowledge that they can renegotiate later. For governments looking to solidify their concession programs, the pressure to accept the

renegotiation (and not risk bankrupting a major infrastructure provider) is great.

Some level of risk, such as policy environment risk, should be assumed by the government. In addition, there may be some argument for providing guarantees in the early stages of a concessioning program, due to the lessons that early concessionaires will then offer for later improvements in the overall program. However, general revenue (*i.e.*, taxpayer-financed) guarantees against risks that should be part of the concessioning process will defeat—to a large degree—the purpose of using infrastructure concessions.

The guaranteed fixed revenue stream that is a part of Manila's MRT3 contract is evidence of this fact. The government does not consider the contract a success and has been wary of concessioned infrastructure projects since.

3.5 Concessions for whom and what purpose?

When an urban transport infrastructure project creates positive externalities, then some degree of subsidy (equivalent to the external benefit) can justifiably be offered within the concession. The size of the subsidy should, generally, be just large enough to make the project attractive to the private sector, but never larger than the value of the externality itself. The government may also play a role in improving the project possibilities by, for example, participating as an equity partner to help satisfy lender requirements for debt-equity ratios. Such participation means that the government can participate on project "upsides" (earning a return), project risks might be reduced (with government as partner), capital costs might be lowered (lower regulatory and project risk premiums), and re-financing might be made easier (Estache and Strong, 1999).

“Concessions should not take on a life of their own.”

Still, while it is important to make sure that worthwhile projects are undertaken, concessions should not take on a life of their own. In other words, closing the project deal and developing more concession projects should not be the end

goal. Instead, the purpose of concessions should simply be to aid, where possible, in the delivery of necessary transport infrastructure. This point sometimes seems lost on concession promoters.

The Santiago highway concessions provide compelling evidence of this phenomenon. The powerful Ministry of Public Works, and its concessions coordinating agency, has pursued concessions aggressively, most likely at the cost of good strategic planning and policy implementation more broadly in the sector (irrespective of whether or not the concessions were “good”). In this case, the Ministry of Finance has also played an influential role, increasingly insistent that users pay for their infrastructure (even in the case of the busway projects). The principle of user pays is generally a very sound one, one that is notoriously ignored in the urban and metropolitan transportation sector. Nonetheless, private concession is not the only way to move towards beneficiaries paying for the infrastructure and services provided; and, the evidence is still out as to the ultimate effects of concession management requirements on total project costs.

3.6 Implications for major impacts

When considering the role of concessions for urban transport infrastructure delivery, one must keep in mind the numerous impacts of transport impacts in urban areas. Areas of concern include:

- **Externalities** – Transport infrastructure and its use often imply costs and benefits external to the direct providers and users. These accrue for both public and private projects, but it remains to be seen how they will be effectively incorporated into private concession schemes. For example, external effects associated with motorways can include: air and noise pollution, traffic safety, negative or positive effects on adjacent landowners, and potentially undesirable impacts on urban form. These are *influenced by long-term traffic generation* due to the expanded infrastructure supply. In Buenos Aires, for example, average daily traffic was 13% higher on affected travel corridors of the Northern Access—due primarily to increased real estate developments in the area that the highway allowed (Ghisolfo, 2001). There are indications

that improved roadway infrastructure (*i.e.*, engineering improvements, etc.) can bring about **improved traffic safety** on the facilities directly affected and for the motorised vehicles using the streets. (The overall impact of a more motorised system would require further analysis.) Again, in the case of the Buenos Aires Northern Access, the accident rate (per VKT) in 2000 was half of the 1993 number, the death and injury rate was 70% less (Ghisolfo, 2000).

In the case of urban roadways, a pervasive and notoriously high profile externality is congestion. Private sector concessions with electronic tolling offer the means for inserting economists' "holy grail" of transportation efficiency—congestion charging—clearly into the public policy realm. As soon as vehicles are equipped with electronic toll charge collection technology and drivers become accustomed to paying for use, more widespread congestion tolling—so the theory goes—should be but a step away. The early returns on this theory in practice are not yet showing promise. Political opposition to toll increases proved to be, at least in part, the undoing of some of Bangkok's original toll road concessions; more recently, the political furor over the implementation of "saturation tariffs" on Santiago's Costanera Norte further exemplifies the challenge. These challenges could well be overcome by better contract design (explicitly targeting part of the congestion fees into a broader urban transportation improvement fund, for example) and, more importantly, full integration of the concessioned projects into the broader metropolitan transportation and land use strategy from the outset.

- **Competing facilities and network performance** – In urban areas, competing facilities and services often either already exist or will/should be provided in the future. In many countries, competing (non-tolled) facilities must be there for an infrastructure concession to be allowed. In other cases, however, concessions are granted an exclusive right to the corridor. How to reconcile the concessionaires' interest in exclusivity with the government's responsibilities toward the public at-large needs further clarification,

particularly as more segments of urban networks are concessioned to the private sector. Engel *et al.*, (1999) suggest that toll competition may be a viable way of regulating private roads.

- **Political patronage** – Political patronage and special interest group influence over urban transport infrastructure is probably as old as the first projects in the sector. The net impact of concessions remains to be seen. On the one hand, through a process of concessioning, the sector might be de-politicised due to open competition for projects, private sector screening of "white elephants," and legal regimes regarding upholding of contracts. On the other hand, the more explicit market forces behind infrastructure delivery and operations might lead to more closed door deals, less transparency, and more interest group influence in policy decisions.
- **Private sector development** – There are several interesting possible effects on the private sector, including the potential to develop local industry and expertise, for international joint ventures and consortia to accelerate technology transfer, and for other forms of cross-fertilization. For example, British interests, which had owned many Argentine railways in the first half of this century, are now reportedly back as potential investors and advisors to the Argentine concessionaires. While a future of closer cooperation is a possibility, so is the potential for cartelization among concessionaires. Large international players are consolidating themselves in the field (*e.g.*, Macquarie, Cintra). The potential for valuable technology- and knowledge-transfer via international joint ventures involving large companies should not be ignored. Creating more space for local firms to "get into the business" of infrastructure delivery and operations should also increase local business acumen. At the same time, however, the private sector—particularly the very large multinational firms—may benefit from the asymmetries in capabilities (*e.g.*, large staffs of well-paid lawyers and financial analysts) relative to the public sector, which allow the private sector to extract rents and other benefits from renegotiations and the like.

Furthermore, due to the limited operational experiences to-date, the long-term sustainability of these initiatives is still uncertain. For example, despite the absence of official contract renegotiations, the railway concessions in Buenos Aires did not emerge from the Argentine economic crisis unaltered. By freezing fares, subsidizing operations and financing infrastructure improvements, the government has, in essence, implemented a de facto renegotiation of concessions.

Considering Kuala Lumpur's takeover of the PUTRA and STAR lines and Bangkok's interest in buying back the BTS and Blue Line concessions, evidence seems to indicate that many governments with PSP projects in public transport are not satisfied with the experience. Government takeover of concessioned projects may be inevitable. At this stage the question becomes: "was it worth it?"

- **Public transport viability** – As seen in the cases of Buenos Aires, Bangkok, Kuala Lumpur, and Manila, most public transportation concessions have involved rail transit infrastructures. Virtually all of these cases have been "partial" concessions—either the government has assumed most of the financial responsibility and risk (at least related to the infrastructure investment costs) and/or the concessions have primarily involved service *operations* as opposed to infrastructure. The Bangkok "Skytrain," involving no financial support from the government, continues to be a poor performer for its investors and its long-term financial return prospects look dim. The Kuala Lumpur systems, STAR and PUTRA, received favorable government loans and were ultimately taken over by the government. In the case of the Manila MRT3, the government will ultimately pay for most of the infrastructure costs via the lease payments. In the Buenos Aires case, the concessions were designed from the outset as "negative concessions"—in which the concessionaire wins the bid based upon the lowest subsidy requested from the government; as discussed, the subsequent national financial crisis ultimately forced a major redesign of the concessions' functioning. Busways and bus rapid transit (BRT) are often pointed to as a more cost-effective public

transport option than rail transit, due to their typically lower construction costs and greater operating flexibility. Although BRT is attractive from a financial and performance perspective—and has been proven effective in several Brazilian cities and elsewhere—concession experiences of bus infrastructure are limited and have not attracted much private sector attention. In Bogotá, efforts to concession a busway failed in 1996, due to an inability to attract financing and a lack of cooperation by existing transport providers. The government went forward with the successful "TransMilenio" project, but without using infrastructure concessions. The attempt by the Municipal Government of São Paulo to concession a network of busways failed, due primarily to lack of financing (see Section 2.2.1).

The Metra corridor in São Paulo, involving a dedicated right of way, functions basically as an operations concession, although the concessionaire does have some infrastructure maintenance responsibilities.

The most recent example of elements of the Transantiago busway infrastructure being concessioned to the private sector is interesting, if a bit confounding. In this case, a concessionaire will build and maintain one of the segregated corridors, while another concession is developing 24 of 35 planned transfer stations in the system. From the available information, the real benefit of using the concession instrument (since there are no operating revenue risks to the concessionaire) remains to be seen.

The future viability of busways as concession projects may prove critical to developing well-balanced urban transport systems.

In theory, there is no clear reason why busways should not be attractive for private sector financing, the challenge is coming up with a few successful examples from which experiences and momentum can be built.

"The potential for negatively impacting the poor is clear, if public funding ultimately is required, thus diverting resources for poverty alleviation."

- **Non-Motorised Transport (NMT)** – Walking and bicycling still account for a major share of all trips in most developing cities. The safety, security, comfort and convenience of non-motorised modes are crucial to sustained NMT participation in trip-making. There is certainly a role for infrastructure in improving NMT travel conditions and some progressive cities, such as Bogotá, have embarked on ambitious plans to expand a bike-way net-work. Whether concessions can play a role in bringing resources to bear on NMT infrastructure development remains to be seen, even though *an interesting historical precedent does exist* (see text box).
- **Poverty** – To date, there has been very little work conducted to assess the impacts of privately provided transport infrastructure on the poor (Houskamp and Tynan, 2000). In developing cities, where the poor make up a large share of the total population, economically justifiable transport infrastructure investments that improve system performance should have a beneficial impact on the poor, but this clearly depends on the type and location of the infrastructure provided. In fact, the potential for negatively impacting the poor is clear, if public funding ultimately is required, thus diverting resources for poverty alleviation (Allport, 2000). Furthermore, the job and housing relocation that often occurs due to right of way acquisition for urban transport infrastructure almost always predominantly displaces poorer groups. White (2000) suggests ways for ensuring that regulatory strategies are beneficial to the poor and regulatory agencies can respond adequately to the needs of the poor. Allport (2000) identifies several potential “pro-poor” transport infrastructure concessions—including busways, public transport terminals and transfer stations—and highlights elements of a “pro-poor” strategy: (i) do not let the concession process and private sector viability dictate transport investments; and (ii) be imaginative in applying concessions (including the use of “negative” concessions to achieve “pro-poor” objectives).

4. The role of international organizations

The multilateral and bilateral aid agencies have an important role to play in promoting and improving urban transport infrastructure concessions. Indeed, most have already put concessions on important ground in their overall infrastructure development strategies and have special assistance geared in this direction (*i.e.*, World Bank’s PPI). Beyond strengthening current activities (information dissemination, lending, providing private sector investment insurance, etc.), the international organizations can play an important role in (ADB, 2000):

1. Preparing the environment and procurement process – legal, regulatory/institutional, contractual frameworks, independent auditing of negotiations (Nicolini, 2001), dispute resolution mechanisms.
2. Broadening the understanding of the range of options for private participation – identify programs and options.
3. Assisting transport strategy formulation – integrated urban transport strategies and priority projects.
4. Investing in projects – to catalyse financing.
5. Developing local capabilities – centres of excellence, project preparation funds, access to experts, perhaps establishing a multi-sector PSP center, with cells in main-line agencies.

Of the points above, numbers 1 and 3 deserve particular emphasis. In fact, both of these are absolutely critical pre-conditions to concession deployment. Understanding the potential role of infrastructure concessions requires a well-developed, comprehensive integrated transportation, land use, and environmental strategy—fully linked with a well-designed, and sustainable system financing plan. Only then, can the “how and where” of infrastructure investment decisions be answered and, then, the proper fit of infrastructure concessions be determined. Of course, rarely do such strategies exist and investment decisions will need to be made anyway. In that case however, *a well-structured regulatory framework, fully independent of the concession promoting agency*, must be in place. Otherwise, concessions will almost certainly not live up to their purpose and will

Concessioned NMT infrastructure in ... the land of the auto?

In August, 1897, Horace Dobbins incorporated the California Cycleway Company to develop a bicycle tollway from the Green Hotel in downtown Pasadena (California) to downtown Los Angeles. An elevated wooden “bike turnpike” was erected (see Figure 8), with financing to come from charging cyclists a toll. Unfortunately, the timing of the “cycleway” coincided with the invention of the automobile and the cycleway soon fell into disuse. Ironically, this elevated, tolled cycleway (Figure 8), served as an inspiration for later toll highways and elevated highways—the cycleway created its own undoing. Recently, however, there have been calls to revive the cycleway concept along the original right of way of Horace Dobbins’ vision; the plans are for the cycleway to operate as a toll facility (see: <http://www.pasonline.com/CCC/ASB.proposal.html>). Perhaps this project, or one from another city will start a new impetus towards the concessioning of viable NMT infrastructure.



Fig. 8
The Horace Dobbins
“cycleway” circa 1900.

<http://csars.calstatela.edu/uei/cycleway.html>

most likely have a net negative impact on the sector. If international organizations are to play one role in this arena it should be in aiding the adequate design, staffing, and support of such agencies. Unfortunately, too often the international agencies seem to be too caught up in the “concession” expectation—pursuing concessions, as opposed to adequate infrastructure delivery, as the end goal.

For bilateral agencies, specifically, Lindfield (1997) offers useful recommendations, including:

- providing organization-to-organization links (*i.e.*, between organizations in the “north” with relevant experience);
- having long-term ‘in country’ staff of development institutions, to better understand institutional context;
- focusing on strengthening central agencies and improving strategic planning;
- facilitating fund accumulation earmarked for infrastructure investment within existing capital markets (such as the ADB’s Infrastructure Development Company);
- working with local financial intermediaries to help them enter the infrastructure market;
- assisting in carrying out sectoral studies, detailing financing approaches in clear and viable economic and institutional contexts.

The international agencies would also do well to focus on some of the issues highlighted in the previous section, working to, for example: develop viable bus-based public transport infrastructure concessions, understand the ideal regulatory structure for urban transport infrastructure concessions, link concession possibilities to broader sustainability issues (*i.e.*, what role, if any, might concessions play in climate change mitigation strategies for urban transport), explore the chance for bikeways and other NMT infrastructure to play the “concessions game,” and identify the “pro-poor” possibilities.

5. Outlook

When considering infrastructure concessions for urban transportation, we first must keep in mind the ultimate goal: to create

“a stable, competitive infrastructure strategy that produces better services, higher quality, and lower costs to users and taxpayers”
(Miller, 2000).

Although it may help achieve this goal, private sector participation will not be a panacea. In fact, according to the ADB (2000) BOT will continue to play a relatively small role in infrastructure provision and maintenance.

The concession road is paved with potential pitfalls and risks. If the toll road sector is any indication of the challenges facing the use of concessions then we must be wary of:

- overestimation of tolls;
- an inability to effectively manage risk;
- inadequate strategic network planning;
- contract renegotiation risk; and
- general political dislike for the costs (*i.e.*, tolls) (Silva, 2000).

“Ironically, privatisation aims to get the government out of the sector, but it actually means a stronger, more well-defined government role through the early creation of independent and accountable regulatory institutions.”

The following outlook (Estache and Strong, 1999) for road infrastructure concessions provides insights into future directions and trends:

- increased risks;
- higher costs of debt finance;
- shorter lending horizons;
- higher equity share requirements;
- changed equity structure (construction equity cannot substitute for reduced portfolio equity, meaning some government equity may be inevitable);
- a shift from Greenfield to rehabilitation/expansion projects;
- an emerging “superclass” of sponsors, bankers, investors.

Now, over half way into the first decade of the 21st Century, we still cannot offer any conclusive comments on the true utility of infrastructure concessions, *in practice*, in the developing countries. Guasch *et al.*, (2005) highlight a number of overall problems, all related to institutional-ity, including: poor attention to the political reality, government tolerance for aggressive bids, poorly designed contracts, rule changes—in short, poor regulatory structure and foresight. In their review of Latin American experiences with roadway concessions, Engel *et al.*, (2003a) note several problems including, pervasive renegotiations, lack of regulatory and supervisory structures, and poor concession design. The prevalence of guarantees and renegotiations mean that losses are almost certainly being passed on to taxpayers. An earlier version of this paper highlighted the problems related to the lack of effective regulatory structures—what Engel *et al.*, (2003a) call the “privatize now, regulate later” approach. Under such an approach, infrastructure concessions may do more harm than good.

We do not know whether cities in the developing world will learn from the experiences to date. However, for this mechanism to grow in use will require a private sector capable of responding, economic stability, and political will and consistency. Perhaps most importantly, the regulatory tools and institutional processes must be improved. Ironically, privatisation aims to get the government out of the sector, but it actually means a stronger, more well-defined government role through the early creation of independent and accountable regulatory institutions regulating fairly and effectively “at arm’s length”. As always seems to be the case in the urban transport sector, the ultimate solutions lie in institutions, not infrastructure.

References

Citations

- Allport, R. 2000. *Transport Services for the Urban Poor*. Paper at “Infrastructure for Development: Private Solutions and the Poor”, 31 May–2 June, London. <http://www.ppiaf.org/conference/presentations.html>
- Asian Development Bank ADB. 2000. *Developing Best Practices for Promoting Private Sector Investment in Infrastructure: Roads*. Manila http://www.adb.org/Documents/Books/Developing_Best_Practices/Roads
- Bholsithi, W. 2005a. BMCL planning to raise the subway ticket prices on October 1. Article translated and summarized from *Manager Daily, Thairath, Dailynews*, August 23, <http://2bangkok.com/2bangkok/Subway/news023.shtml>
- Bholsithi, W. 2005b. Siemens warned of consequences if subway continues to fail. Article translated and summarized from *Channel 11*, 20 February: <http://www.angkor.com/2bangkok/2bangkok/Subway/index.shtml>
- Bholsithi, W. 2005c. Skytrain breaks 500,000 passengers in a day barrier. Article translated and summarized from *Thairath*, 14 December: <http://angkor.com/2bangkok/2bangkok/Skytrain/bts05.shtml>
- Bholsithi, W. 2006. BTS revenue sharing schemes for Taksin Extension. Article translated and summarized from *Prachachart Thurakij*, January 16-18: <http://angkor.com/2bangkok/2bangkok/Skytrain/taksin.shtml>
- Comisión Nacional de Regulación de Transporte de Argentina CNRT. 2005. *Informes de Pasajeros: Pasajeros Metropolitanos*. Available at <http://www.cnrt.gov.ar/index2.htm>
- Contraloría General de la República. 2006. *Atiende Reclamos Formulados por los Señores P. Hermán P., P. Sainz S. P. González A, y Doña M. González L. VUOPTSJ: 1.228, SJ: 19.06, REF: 60.845 / 04, 6.394 / 05, SMF / ERF, Santiago, 16 March.*
- Cruz, C. M. E. Barrientos, S. Babbar. Undated. *Toll Road Concessions: The Chilean Experience*. PFG Discussion Paper Series, No. 124, World Bank, Project Finance and Guarantees Dept. http://www.worldbank.org/html/fpd/guarantees/assets/images/Toll-Roads_0514.pdf
- *Diario Oficial de la Republica de Chile*. 2006. Decreto número 16. pp. 9-15.
- Empresa Metropolitana de Transportes Urbanos de São Paulo EMTU. 2005. *Índice de Qualidade do Transporte: Uma ferramenta na gestão do transporte na Região Metropolitana de São Paulo*. Available at: <http://www.emtu.sp.gov.br/iqt/>
- Engel, E. R. Fischer, A. Galetovic. 2003a. Privatizing Highways in Latin America: Is it Possible to Fix What Went Wrong? *Economia: The Journal of LACEA*, Vol. 4, No. 1, October, pp. 129–158, available at: <http://cowles.econ.yale.edu/~engel/research.htm>
- Engel, E. R. Fischer, A. Galetovic. 2003b. *Soft Budgets and Highway Franchising*. Working Paper, December, available at: <http://cowles.econ.yale.edu/~engel/research.htm>
- Engel, E., R. Fischer, A. Galetovic. 2001. Least-Present-Value-of-Revenue Auctions and Highway Franchising. *Journal of Political Economy*, Vol. 109, pp. 993-1020.
- Engel, E., R. Fischer, A. Galetovic. undated. *The Chilean Infrastructure Concessions Program: Evaluation, Lessons and Prospects for the Future*. http://cowles.econ.yale.edu/~engel/pubs/pub_060.pdf
- Estache, A. and J. Strong. 2000. *The Rise, the Fall and... the Emerging Recovery of Project Finance in Transport*. Policy Research Working Paper No. 2385, The World Bank, Washington, DC, July http://www.worldbank.org/wbi/regulation/pubs/2385rise_fall.htm
- Estache, Antonio. *Privatization and Regulation of Transport Infrastructure in the 1990s: Successes – and Bugs to Fix for the Next Millennium*, Antonio Estache. Washington, DC: World Bank Institute, Governance, Regulation, and Finance, [1999]. Online Access: Materials included: Abstract and full text; Access note: full text available in pdf format at same site; http://www.worldbank.org/wbi/infrafin/r_publications.html
- Franco, I. 2005. New Brazilian Public-Private Partnership Law. *World Trade Executive*.

Available at: http://www.wtexecutive.com/cms/content.jsp?id=com.tms.cms.article.Article_3a77b80b-97cba9a0-1517e5e0-3f955d0e

- Fundación de Investigaciones Económicas Latinoamericanas FIEL. 1999. *La Regulación de la Competencia y de los Servicios Públicos: Teoría y Experiencia Argentina Reciente*. Buenos Aires.
- Ghisolfo, F. 2001. "La evaluación socio-económica de concesiones de infraestructura de transporte: análisis preliminar del caso Acceso Norte a la ciudad de Buenos Aires, Argentina." *Recursos Naturales e Infraestructura, Serie 314*. National Resources and Infrastructure Division, Transport Unit, United Nations Economic Commission for Latin America and the Caribbean.
- Graham, J. 2004. A New Approach to Infrastructure Finance. Presentation available at: <http://www.iadb.org/biz/ppt/0604grahamb.ppt>.
- GTZ, *Economic Instruments*, Buenos Aires. K.J.L. Nicolini, 2000.
- GTZ, *Mission Report* Karl Fjellstrom, Buenos Aires Sustainable Urban Transport Project, 2002.
- Guasch, J.L. 2004. *Granting and Renegotiating Infrastructure Concessions: Doing it Right*. WBI Development Studies. The World Bank.
- Guasch, J.L., J.-J. Laffont, S. Straub. 2005. *Infrastructure Concessions in Latin America: Government-led Renegotiations*. World Bank Policy Research Working Paper 3749, October.
- Gutman, D. 2006. Licitan obras para mejorar las vías y los trenes del Sarmiento. *Clarín*. February 22.
- Halcrow Group Limited. 2004. *A Tale of Three Cities: Urban Rail Concessions in Bangkok, Kuala Lumpur and Manila*. Report prepared for ADB-JBIC-World Bank East Asia and Pacific Infrastructure Flagship Study.
- Houskamp, M. and N. Tynan. 2000. *Review of PPI Projects to Identify Potentially "Pro-Poor" and "Anti-Poor" Provisions*. Paper presented at Infrastructure for Development: Private Solutions and the Poor, 31 May–2 June, London. <http://www.ppiaf.org/conference/presentations.html>
- Light Rail Transit Authority of Manila. 2006. *Bidding for the LRT Line 2 System Maintenance Contract*. Bid Bulletin No. 01-06. <http://www.lрта.gov.ph/ITB/bidbulletin.htm>
- Litovsky, E. 2003. *Metrovías S.A.: Concesionario Privado de los Subterráneos de la Ciudad de Buenos Aires y la Línea Urquiza* [Metrovías S.A.: Private concessionaire of Buenos Aires subways and the Urquiza line] Microsoft PowerPoint file.
- Mass Rapid Transit Authority of Thailand MRTA. 2006. *Current Progress of Extension Projects*. <http://www.mrta.co.th/eng/index.htm>
- Menckhoff, G. and C. Zegras. 1999. *Experiences and Issues in Urban Transport Infrastructure Concessions*. World Bank Working Paper, TWU-38 http://www.worldbank.org/transport/publicat/pub_tran.htm
- Metra. 2006. Company web-site: <http://www.metra.com.br>
- Metro. 2006. Company web-site. <http://www.metro.sp.gov.br>
- Midgley, P. 1994. *Urban Transport in Asia: An Operational Agenda for the 1990s*. World Bank Technical Paper No. 224, Asia Technical Department Series, Washington, D.C. <http://www.lead.org/lead/training/international/okinawa/papers/midgley.doc>
- Miller, J.B. 2000. *Principles of Public and Private Infrastructure Delivery*. Kluwer Academic Publishers, Norwell, MA.
- Ministerio de Obras Públicas MOP. 2006. Information take from the web-site of the Coordinación General de Concesiones: http://www.concesioneschile.cl/proyectos_concesiones.htm
- Nicolini, J.L. 2001. *Toll Road Concessions in Argentina*. Presented to the Annual Meeting of the Asociación Argentina de Economía Política, June http://www.aaep.org.ar/espa/anales/resumen_01/nicolini.htm
- Novillo, P. 2006. *Denuncia oficial por trenes que parten con puertas abiertas y gente en los estribos*. *Clarín*. 10 March.

- Philippine Department of Transportation and Communications. 2006. *Metrostar Express Daily Ridership, December 2005*. <http://www.dotcmrt3.gov.ph/index.htm>
- Pracharat Thurakij. 2006. <http://www.2Bangkok.com>
- Quijada, R. 2006. *Crónica de una Autopista Anunciada: La Historia de la Costanera Norte 1995-2005*. Draft report.
- Rebelo, J. 2006b. *Personal communication*. 17 April.
- Rebelo, J. and P. Machado. 2000. *The São Mateus-Jabaquara Trolleybusway Concesión in Brazil*. Policy Research Working Paper 2353, World Bank, May.
- Rebelo, J. M. 2006a. *The Buenos Aires Suburban Railways and Subway Concessions: Lessons Learned*. Paper prepared for presentation at CODATU, Lyon, France.
- Rebelo, J.M. 1999a. *Reforming the Urban Transport Sector in the Rio de Janeiro Metropolitan Region: A Case Study in Concessions*, World Bank, Policy Research Working Paper 2096, April. <http://www.worldbank.org/html/dec/Publications/Workpapers/wps2000series/wbs2096/wps2096.pdf>
- Rebelo, J.M. 1999b. "Rail and Subway Concessions in Rio de Janeiro: Designing Contracts and Bidding Processes," *Viewpoint, Note No. 183*, World Bank, April. <http://www.worldbank.org/html/fpd/notes/183/183rebel.pdf>
- Rebelo, J.M. and P.P. Benvenuto. 1995. *Concessions of Busways to the Private Sector: The São Paulo Metropolitan Region Experience*, World Bank, Policy Research Working Paper 1546. November. <http://www.worldbank.org/html/dec/Publications/Workpapers/wps1546-abstract.html>
- Rebelo, J.M. and P.P. Benvenuto. 1997. "Lessons from São Paulo's Metropolitan Busway Concessions Program," World Bank, Policy Research Working Paper 1859, December. <http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1800series/wps1859/wps1859-abstract.html>
- Roa, R. 2006. Trenes fuera de control. *Clarín*. 6 March.
- Rossi, A. 2006. Licitan en abril obras para terminar de electrificar el ferrocarril Roca. *Clarín*. March 26.
- Sánchez, N. 2006. El ombudsman presentó más pruebas contra las ferroviarias. *Clarín*. March 15.
- Secretaría de Transporte de la Nación Argentina. 2001. Decreto No 802/01 as referenced in Decreto No. 976/01. <http://www.transporte.gov.ar/html/subsi.htm>
- Secretaría de Transporte de la Nación Argentina. 2002. Decreto No 2075/02. <http://www.transporte.gov.ar/html/subsi.htm>
- Silva, G. 2000. "Toll Roads: Recent Trends in Private Participation." *Public Policy for the Private Sector, Note Number 224*, World Bank Private Sector and Infrastructure Network, December. <http://www.worldbank.org/html/fpd/notes/224/224summary.html>
- Small, K. *Urban Transportation Economics*. Harwood Academic Publishers, Chur, 1992.
- Smith, W. 2000. *Regulating Infrastructure for the Poor: Perspectives on Regulatory System Design*. Paper presented at Infrastructure for Development: Private Solutions and the Poor, 31 May–2 June, London. <http://www.ppiaf.org/conference/presentations.html>
- TNA. 2005. <http://www.2Bangkok.com>
- Transantiago. 2006. Information taken from web-site: <http://www.transantiago.cl>
- United Nations Economic and Social Commission for Asia and the Pacific UN ESCAP. 2001a. *Emerging Issues in Transport, Communications and Infrastructure Development: Infrastructure Financing and Private Sector Participation*. Note by the Secretariat for the Meeting of Senior Government Officials in Preparation for the Ministerial Conference on Infrastructure, Seoul, http://www.unescap.org/tctd/seoul2001/files/SGOMCI_6.pdf
- United Nations Economic and Social Commission for Asia and the Pacific UN ESCAP. 2001b. *Sustainable Transport Pricing and Charges: Principles and Issues*. Published by UN ESCAP and the Asian Institute of Transport Development <http://www.unescap.org/tctd/pubs/pricetoc.htm>

- United Nations Economic Commission for Latin America and the Caribbean UN ECLAC. 1999. *Un Análisis del Concesionamiento de Autopistas Urbanas, con Referencia a los Casos de la Costanera Norte de Santiago de Chile y del Eje Javier Prado de Lima*. March 1999. <http://www.eclac.cl/analisis/TES69.htm>
- Webster, D. and P. Theeratham. 2004. *Policy Coordination, Planning and Infrastructure Provision: A Case Study of Thailand*. ADB-JBIC-World Bank East Asia and Pacific Infrastructure Flagship Study.
- World Bank, 2005. Implementation Completion Report on a Loan in the Amount of US\$45 Million to the State of São Paulo for the São Paulo Integrated Urban Transport Project. Finance, Private Sector and Infrastructure Department, Latin America and Caribbean Regional Office, Washington, DC, June 24.
- World Bank. 1996. *Sustainable Transport: Priorities for Policy Reform*. Washington, DC <http://www.worldbank.org/transport/publicat/twu-22/toc.htm>
- World Bank. 1999. *Bangkok Urban Transport: Options for Sustaining Mobility* draft. Transport Sector Unit, East Asia and Pacific Region.
- World Bank. 2001. *Cities on the Move: A World Bank Urban Transport Strategy Review*. Washington, DC, draft of 17 October http://www.worldbank.org/transport/publicat/pub_tran.htm
- World Business Council for Sustainable Development WBCSD. 2001. *Mobility 2001*. <http://www.wbcsdmobility.org>
- Zegras, C. 2002. *Financing Transport Infrastructure in Developing Country Cities: Evaluation of and Lessons from the Nascent Use of Impact Fees in Santiago de Chile*. Paper submitted for presentation at the 82nd Annual Meeting of the Transportation Research Board TRB, Washington, DC, January 2003.

Other references

- Asian Development Bank, 2000 BOT *Project Database*, http://www.adb.org/Documents/Books/Developing_Best_Practices/Roads
- Dailami, M. and M. Klein. *Government Support to Private Infrastructure Projects in Emerging Markets*. Paper was presented at the Conference “Managing Government Exposure to Private Infrastructure Projects: Averting a new-style debt crisis” Cartagena, Colombia, 29–30 May 1997. <http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1800series/wps1868/wps1868-abstract.html>
- <http://www.unescap.org/tctd/gt/ppp.htm#activities>
- http://www.worldbank.org/transport/publicat/pub_tran.htm
- Michel Kerf, *et al.*, 1998, “*Concessions for Infrastructure: A Guide to Their Design and Award*,” World Bank Technical Paper No. 399, the World Bank, Washington, DC. <http://rru.worldbank.org/Toolkits/concessions/>
- *Toolkit for Public-Private Partnership in Highways*. http://www.ppiaf.org/toolkits/pphighways/5_imple/54/54_.htm
- World Bank PPI Database: <http://www.worldbank.org/html/fpd/privatesector/PPIDBweb/intro.htm>



Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

Dag-Hammarskjöld-Weg 1-5
P. O. Box 5180
65726 ESCHBORN / GERMANY
Phone +49-6196-79-1357
Telefax +49-6196-79-7194
Internet <http://www.gtz.de>

