



# Financing Sustainable Urban Transport

## Module 1f

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

## OVERVIEW OF THE SOURCEBOOK

### Sustainable Transport:

### A Sourcebook for Policy-Makers in Developing Cities

#### What is the Sourcebook?

This *Sourcebook* on Sustainable Urban Transport addresses the key areas of a sustainable transport policy framework for a developing city. The *Sourcebook* consists of more than 28 modules mentioned on the following pages. It is also complemented by a series of training documents and other material available from <http://www.sutp.org> (and <http://www.sutp.cn> for Chinese users).

#### 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. The academic sector (e.g. universities) has also benefited from this material.

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

The *Sourcebook* can be used in a number of ways. If printed, 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 has and is still further elaborating training packages for selected modules, all available since October 2004 from <http://www.sutp.org> or <http://www.sutp.cn>.

#### 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 experiences in developing cities.
- Contributors are leading experts in their fields.
- An attractive and easy-to-read, colour layout.
- Non-technical language (to the extent possible), with technical terms explained.
- Updates via the Internet.

#### How do I get a copy?

Electronic versions (pdf) of the modules are available at <http://www.sutp.org> or <http://www.sutp.cn>. Due to the updating of all modules print versions of the English language edition are no longer available. A print version of the first 20 modules in Chinese language is sold throughout China by Communication Press and a compilation of selected modules is being sold by McMillan, India, in South Asia. Any questions regarding the use of the modules can be directed to [sutp@sutp.org](mailto:sutp@sutp.org) or [transport@gtz.de](mailto:transport@gtz.de).

#### Comments or feedback?

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

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#### Further modules and resources

Further modules are under preparation in the areas of *Parking Management* and *Urban Freight in Developing Cities*.

Additional resources are being developed, and Urban Transport Photo CD-ROMs and DVD are available (some photos have been uploaded in <http://www.sutp.org> – photo section). You will also find relevant links, bibliographical references and more than 400 documents and presentations under <http://www.sutp.org>, (<http://www.sutp.cn> for Chinese users).

## Modules and contributors

- (i) *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 Zегras, MIT)  
1d. *Economic Instruments* (Manfred Breithaupt, GTZ)  
1e. *Raising Public Awareness about Sustainable Urban Transport* (Karl Fjellstrom, Carlos F. Pardo, GTZ)  
1f. *Financing Sustainable Urban Transport* (Ko Sakamoto, TRL)

### 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, ITDP; Karl Fjellstrom, GTZ)  
3b. *Bus Rapid Transit* (Lloyd Wright, ITDP)  
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, ITDP)

### Vehicles and fuels

- 4a. *Cleaner Fuels and Vehicle Technologies* (Michael Walsh; Reinhard Kolke, Umweltbundesamt – UBA)  
4b. *Inspection & Maintenance and Roadworthiness* (Reinhard Kolke, UBA)  
4c. *Two- and Three-Wheelers* (Jitendra Shah, World Bank; N.V. Iyer, Bajaj Auto)  
4d. *Natural Gas Vehicles* (MVV InnoTec)  
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 Organization)  
5b. *Urban Road Safety* (Jacqueline Lacroix, DVR; David Silcock, GRSP)  
5c. *Noise and its Abatement* (Civic Exchange Hong Kong; GTZ; UBA)  
5d. *The CDM in the Transport Sector* (Jürg M. Grütter)  
5e. *Transport and Climate Change* (Holger Dalkmann; Charlotte Brannigan, C4S)  
5f. *Adapting Urban Transport to Climate Change* (Urda Eichhorst, Wuppertal Institute)

### Resources

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

### Social and cross-cutting issues on urban transport

- 7a. *Gender and Urban Transport: Smart and Affordable* (Mika Kunieda; Aimée Gauthier)

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This module builds upon earlier work by **Dr Gerhard P. Metschies** and by **Michael Fink** to whom the authors are grateful for making their earlier drafts available.

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## Module 1f

# Financing Sustainable Urban Transport

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## Abbreviations

ADB	Asian Development Bank	JICA	Japan International Cooperation Agency
ALS	Area Licensing Scheme	JNNURM	Jawaharlal Nehru National Urban Renewal Mission (India)
BOST	Bulk Oil Storage and Transportation	JPY	Japanese Yen
BOT	Build-Operate-Transfer	LRT	Light Rail Transit
BRT	Bus Rapid Transit	LTA	Land Transport Authority Singapore
CBD	Central Business District	MRT	Mass Rapid Transit
CDM	Clean Development Mechanism	MVUC	Motor Vehicle User's Charge (The Philippines)
CDP	City Development Plan	NAMA	Nationally Appropriate Mitigation Action
CEFPF	Clean Energy Financing Partnership Facility	NGO	Non Governmental Organisation
CIF	Climate Investment Funds	NIS	Israeli New Shekel
CIP	Capital Improvement Plan	NPA	National Petroleum Authority (Ghana)
CNBL	Center for National Budget Legislation (The Philippines)	ODA	Official Development Aid
CNG	Clean Natural Gas	OECD	Organisation for Economic Co-operation and Development
COE	Certificate of Entitlement	OMC	Oil Marketing Company
COP15	United Nations Climate Change Conference 2009 in Copenhagen	OSMOSE	Open Source for Mobile and Sustainable city
CTF	Clean Technology Fund	PBC	Performance Based Contract
EBRD	European Bank for Reconstruction and Development	PFI	Private Finance Initiative
ECMT	European Conference of Ministers of Transport	PoA	Programme of Activities
EEA	European Environment Agency	PPIAF	Public-Private Infrastructure Advisory Facility
EIA	Energy Information Administration (US)	PPP	Public Private Partnership
ELTIS	European Local Transport Information Service	PTEG	Passenger Transport Executive Group
ERP	Electronic Road Pricing	PTV	PTV Planung Transport Verkehr AG
EUR	Euro	PwC	PricewaterhouseCoopers
GBP	Great Britain Pound	PWLB	Public Works Loan Board
GEF	Global Environment Facility	TfL	Transport for London
GTKP	Global Transport Knowledge Partnership	TRL	Transport Research Laboratory (UK)
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) GmbH	UK	United Kingdom
HGV	Heavy Goods Vehicle	UMTA	Unified Metropolitan Transport Authority (India)
ICI	International Climate Initiative (Germany)	UNEP	United Nations Environment Programme
INR	Indian Rupee	UNFCCC	United Nations Convention on Climate Change
ITDP	Institute for Transportation and Development Studies	UPPF	Unified Petroleum Price Fund
ITS	Intelligent Transport Systems	US	United States
JAMA	Japan Automobile Manufacturers Association	USD	US Dollar
		VQS	Vehicle Quota System (Singapore)
		VT	Versement Transport
		VTG	Vision Transportation Group
		WB	World Bank

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# 1. The importance of finance in sustainable urban transport

## 1.1 Why is financing important?

Cities and towns around the world face a major gap between meeting the needs of the local population for an efficient, equitable and environmentally friendly urban transport system, and the financial resources available to meet these demands. Infrastructure for public transport, footways and bicycle paths are often unfunded. Public transport services are informal, inadequate and often dangerous due to lack of investments in formal services. Resources for the operation and maintenance of transport facilities and services also fall under financial pressures, leading to the erosion of assets and putting to waste billions of dollars worth of capital investments.

*“Many cities are paying themselves into a deadlock.”*

On the other hand, large amounts of resources are spent on costly options such as flyovers, ring roads and urban highways, which makes driving more attractive and hence create extra traffic. This in turn increases the pressure to build even



more infrastructure to accommodate this new demand. The rapid increase in motorised traffic increases congestion, air pollution and accidents, whose costs fall back to the city and its citizens in terms of lower productivity, fuel costs and health/hospitalisation costs. This situation may be likened to buying an expensive phone on one’s credit card, not only to find the phone outdated in 6 months time, but also an increase in the monthly phone bill.

**Figure 1**  
*Abandoned construction of a monorail in Jakarta Indonesia partly due to financial constraints.*

Photo by Ko Sakamoto, 2009

**Private car-oriented investment**

**Poor provision for pedestrians**

**Lack of resources for vehicle and road maintenance**



**Bangkok**

Photo by Karl Fjellstrom, 2002



**Madras**

Photo by Santhosh Kodukula, 2008



**Jakarta**

Photo by Ko Sakamoto, 2009



**Seoul**

Photo by Soul Development Institute



**Bangkok**

Photo by Carlosfelipe Pardo, 2005



**Nanded**

Photo by Jeroen Buis, 2007

**Figure 2**  
*Signs of poor funding practice and low priority given to sustainable modes.*

In cities across the world, the inadequate and inappropriate urban transport financial arrangements are largely responsible for the worsening urban transport situation, as shown in Figure 2.

To help meet these challenges, this *Sourcebook* module explores the sources of current problems, highlights the main barriers that need to be overcome, and outlines practical suggestions that can help build effective financing<sup>[1]</sup> arrangements. These are illustrated by case studies from around the world.

The module is structured as follows:

- **Chapter 1** introduces the topic of financing, and discusses its importance in the pursuit of sustainable urban transport.
- **Chapter 2** outlines the main challenges faced by policy makers worldwide, in financing a sustainable transport system.
- **Chapter 3** presents the main approaches and specific instruments that can be used to allow a move towards a fully sustainable

<sup>[1]</sup> In this *Sourcebook*, the terms financing and funding are used interchangeably. According to the Oxford English Language Dictionary, funding refers to “providing with money for a particular purpose”, whereby financing is to “provide funding for (a person or enterprise).” Colloquially, funding often implies that the money is already there to dispense, whereas financing includes the act of raising (or paying back) that money.

### Box 1: Other GTZ *Sourcebook* modules with particular relevance to financing

There are currently 28 GTZ *Sourcebook* modules covering a wide range of topics relevant to sustainable urban transport, many of which relate to the issues described in this module. In particular, the reader may wish to consult the following modules for further information:

- 1a: The Role of Transport in Urban Development Policy
- 1b: Urban Transport Institutions
- 1c: Private Sector Participation in Urban Transport Infrastructure Provision
- 1d: Economic Instruments
- 3c: Bus Regulation and Planning
- 5d: The CDM in the Transport Sector
- 5e: Transport and Climate Change

All *Sourcebook* modules are available for download at <http://www.sutp.org>.

transport system, as well as ways in which they can be effectively combined.

Note is taken that every city and region is faced with their unique challenges, and that workable policies must take these into account. It is important that the points raised within this document are always tailored to local conditions.

## 1.2 Who is involved in financing urban transport?

*“Financing urban transport involves various actors, all who play different but important roles.”*

The major actors include:

- **City administrations** – who are responsible for raising local financial resources, coordinating funding, implementing policies and in many countries operating public transport systems directly.
- **National and regional governments** – who raise resources at a national/regional level, and set rules for the allocation and redistribution of resources between national and local levels.
- **Citizens** – who use urban transport systems, pay taxes, charges and fees, as well as take ultimate responsibility of public policy as voters.
- **Donors/International organisations** – who provide financing (through Official Development Assistance – ODA), technology and knowledge, as well as promote good governance.
- **Private sector** – who operate public transport, manufacture vehicles, and provide infrastructure. Some of these services are provided informally, as shown in Box 2.

The scope and nature of the roles of these actors differ by local context. In some countries, the national government has historically played a dominant role in raising and allocating the sources of transport funding (particularly for large infrastructure projects), whereas in other countries, cities are given more autonomy over their funding decisions.

In any case, it is important that the needs of all stakeholders are taken into account when



## Box 2: Counting the invisible: The role of informal actors

In many developing cities, particularly those in Asia, transport services (e.g. cycle rickshaws and motorcycle taxis) are provided by those whose activities are not regulated by the government. On one hand, they play a central role in providing mobility to citizens which otherwise may be more expensive or non-existent, and also provide a source of employment for many of the urban poor.



Figures 3a, b

*Cycle rickshaws in Dhaka, Bangladesh (left).*

Photos by Karl Fjellstrom, 2004

*Motorcycle taxis in Lahore, Pakistan (right).*

Photo by Manfred Breithaupt, 2008

See:

- Cervero, R (2000) Informal Transport in the Developing World <http://www.unhabitat.org/pmss/getElectronicVersion.aspx?nr=1534&alt=1>
- For more information on informal public transport, please see reading list from GTZ [http://www.sutp.org/index.php?option=com\\_docman&task=cat\\_view&gid=31&Itemid=54&lang=](http://www.sutp.org/index.php?option=com_docman&task=cat_view&gid=31&Itemid=54&lang=)

developing an effective financing framework for urban transport. Given the limits to what the public sector can finance directly (via general taxes), it is important to consider in particular:

- **Engaging the private sector** to build, operate, and finance urban transport infrastructure and services (including public transport), coupled with strong regulatory/contractual frameworks that effectively manage the activities of the private sector.
- **A move towards receiving direct support** from transport users, especially private vehicle users, for the costs of the facilities and services being provided to them at public expense, as well as the external costs they create to society.

These aspects will be detailed further in later sections of this *Sourcebook* module.

### 1.3 What is the scale of resources involved?

The various actors identified previously all contribute to the financing of urban transport in important ways.

Beginning with **public spending**, it is commonly known that many cities in developing countries invest as much as 15–25 % of annual expenditure on transport. Again, figures will vary depending on the historical context and model of financing. However they indicate the high importance of the sector placed within the city's budget, and the implications of its usage in supporting a sustainable transport system.

From the angle of the **citizen**, transport constitutes a significant part of the household budget, especially in poorer households. For instance in

**Table 1: Expenditure on travel to work in Buenos Aires in 2002**

Income range	Average household income per week (\$)	Average family expenditure on travel to work per week (\$)	Percentage of income on travel to work
Bottom quintile	211.2	66.8	31.6 %
Fourth quintile	449.2	107.8	24.0 %
Third quintile	564.1	86.4	15.3 %
Second quintile	902.4	96.5	10.7 %
Top quintile	1748.7	149.0	8.5 %
<b>Average</b>	<b>833.5</b>	<b>106.5</b>	<b>12.8 %</b>

Source: World Bank, 2005

**Table 2: Urban transport projects by the World Bank between 1995 and 2005**

	1995–2000	2001–2006	1995–2006
<b>Total number of urban projects</b>	<b>41</b>	<b>37</b>	<b>78</b>
<b>Components</b>	<b>78</b>	<b>77</b>	<b>155</b>
Urban roads	27	24	51
Traffic management and safety	10	9	19
Institutional, regulatory and planning	12	19	31
Non-motorised transport, urban poor	7	7	14
Urban environment, air quality	3	3	6
Public transport	19	15	34

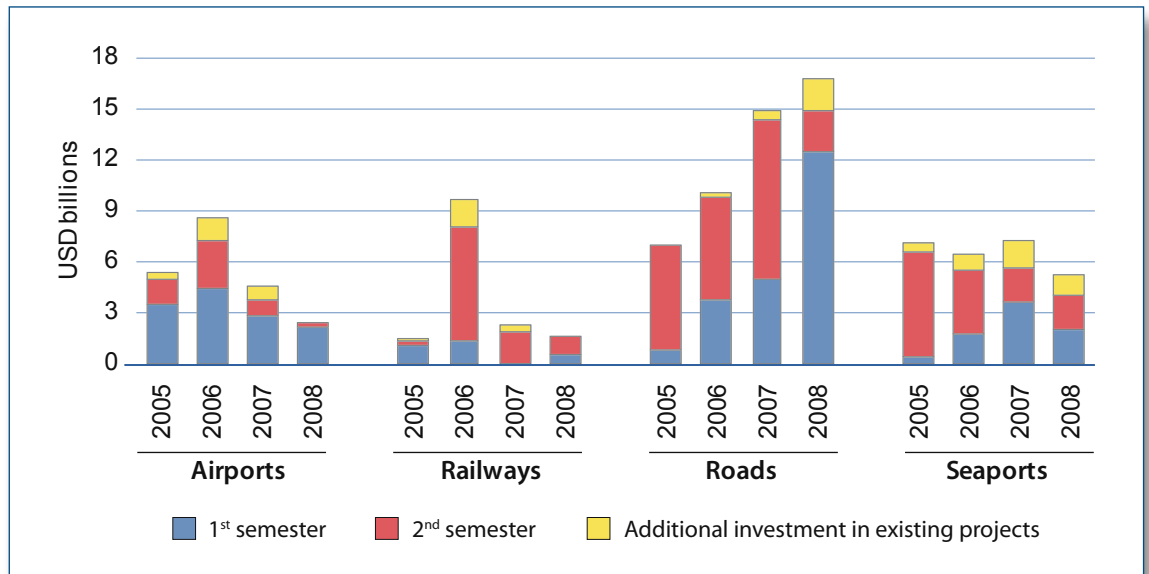
Source: World Bank, 2007

Buenos Aires, those at the bottom quintile of the income scale pay more than 30 % of their income for travel to work (see Table 1).

Commitments by *international institutions* (through grants and concessional loans) are also significant, and span a multitude of components including urban roads, traffic management, institutions and public transport. However,

relative to intercity roads and highways, urban transport has historically been underrepresented in the portfolio of the major development banks. For example, urban transport projects (detailed in Table 2) only made up 5–8 % of the transport portfolio of the World Bank between 1995 and 2006, although transport as a whole received nearly one fifth of the Bank's commitments (World Bank, 2007).

*Private sector* contributions in urban transport take various forms, including capital investments in infrastructure using various mechanisms such as 'build, operate, transfer' (BOT) and others, public transport operations under contract or franchise, the plethora of informal transport as well as vehicle manufacturing and development. Whilst these are difficult to fully quantify, it is nevertheless important to recognise their large role in urban transport financing. According to the World Bank and Public-Private Infrastructure Advisory Facility (PPIAF), private participation in transport infrastructure



**Figure 4**  
Transport investment commitments with private participation reaching closure in developing countries, by subsector, 2005–2008.

Source: World Bank and PPIAF, 2009a

### Box 3: Private bus operators in developing countries

Public transport in developing countries is often provided by private companies, many of whom are not regulated and exist in informal ways. For example in India, 71.3% of the total number of buses in the country is provided by the private sector with only 28.7% provided by the public sector (Kulkarni, S 1997).

Whilst these services can be seen as compensating for the lack of public services, there are a number of associated problems which include the following:

- The bus service across a city is poorly coordinated, as there are usually a large number of private individuals or smaller companies which are very scarcely distributed and perform independently.
- Passenger safety is poor as private operators can only make a livelihood by adopting aggressive forms of competitive behaviour on the road and by operating poor quality, poorly maintained vehicles.
- As the system is not formalised private entrepreneurs are only willing to invest their own resources in assets which are highly flexible and respond quickly to market demand. In addition under these circumstances neither vehicle manufacturers nor banks will lend or lease for the operation of large vehicles.
- Most informal operators have little financial credibility or training and therefore pose a considerable risk to vehicle manufacturers and banks.

- Fare box revenues are often not recorded and therefore it is difficult to estimate tax or other local commercial dues.

There are a number of barriers to implementing reforms to improve the quality of service provision and the safety of passengers including a lack of commitment to fully fledged reform, protection of vested interests, and inadequate or inappropriate attention to detail (Gwilliam, 2005). It is very difficult if not impossible for local government to introduce any form of regulation or integration, even in terms of ticketing as there is no interest in a cohesive system, passenger information is poor or non-existent and the planning and use of infrastructure is not optimal or efficient.

To address these issues bus services operated by the private sector in developing countries need to be formalised, finding a way to mobilise and discipline the organization of informal sector operators within a market based process.

See:

- GTZ Sourcebook Module 3c: *Bus Regulation and Planning* <http://www.sutp.org>
- Kulkarni, S (1997) Funding of public passenger transport in developing countries – a case of India [http://www.thredbo.itls.usyd.edu.au/downloads/thredbo6\\_papers/Thredbo6-theme2-Kulkarni.pdf](http://www.thredbo.itls.usyd.edu.au/downloads/thredbo6_papers/Thredbo6-theme2-Kulkarni.pdf)
- Gwilliam, K (2005) Bus Franchising in Developing Countries: Some Recent World Bank Experience [http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/bus\\_franch\\_gwilliam.pdf](http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/bus_franch_gwilliam.pdf)



Figures 5a, b

*Private bus operators in Bangkok, Thailand, 2008 (left); in Lima, Peru, 2007 (right).*

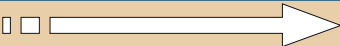
Photos by Carlosfelipe Pardo

provision topped USD 30 billion in 2006 globally. These activities are generally focused towards large developing and transitional countries such as India, Brazil, China, Mexico and Turkey. A vast majority of private finance is spent on roads, seaports and airports (Figure 4).

In addition to infrastructure, a great majority of urban public transport services is provided by the private sector in many developing countries (see Box 3).

**Box 4: Questions and actions from Chapter 1:  
Understanding the importance of financing**

Based on the discussions from this chapter, the importance of financing in the local context may be better understood by seeking answers to the following questions, and then following the actions specified. This initial brainstorming exercise may help highlight the uniqueness of the city under consideration, and lead to a realistic understanding of the necessary reforms.

Questions 	Actions
<ul style="list-style-type: none"> <li>■ What are the main problems in transport faced in your city?</li> <li>■ Which of these are attributable (either in full or in part) due to inadequate or improper financing practices?</li> </ul>	<ul style="list-style-type: none"> <li>■ Develop a list or mind-map of the larger problems and barriers (e.g. political, institutional) and note how they are related to inadequacies in financing.</li> </ul>
<ul style="list-style-type: none"> <li>■ Who are the major actors involved in urban transport in your area?</li> <li>■ Who is in charge of the major components of urban transport and their budgets?</li> <li>■ How much communication takes place between these actors?</li> </ul>	<ul style="list-style-type: none"> <li>■ Establish and strengthen channels of joint-working between the relevant organisations, including discussion groups, joint meetings, and if applicable staff exchanges between e.g. the transport and finance departments of local authorities.</li> <li>■ Clearly communicate the existing problems and initiate a joint dialogue.</li> </ul>
<ul style="list-style-type: none"> <li>■ To what extent is the private sector involved in the provision of transport services?</li> </ul>	<ul style="list-style-type: none"> <li>■ Seek areas where more participation from the private sector can be beneficial. Conversely, identify areas where the private sector is undermining service quality.</li> </ul>
<ul style="list-style-type: none"> <li>■ How much do local citizens spend on transport? Is the picture different between different income groups?</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the real concerns of the users of urban transport, in particular the poor who have less access to high-quality transport services and take appropriate actions (e.g. the introduction of social tariffs).</li> </ul>



## 2. The double challenge: financing sustainable urban transport, sustainably

As a first step towards solving the problems around financing, this chapter sets out with a set of goals to achieve, and the main barriers that need to be overcome to achieve these goals.

Reflecting on the situation described in Chapter 1, the current challenge facing policy-makers in terms of financing can be described as twofold:

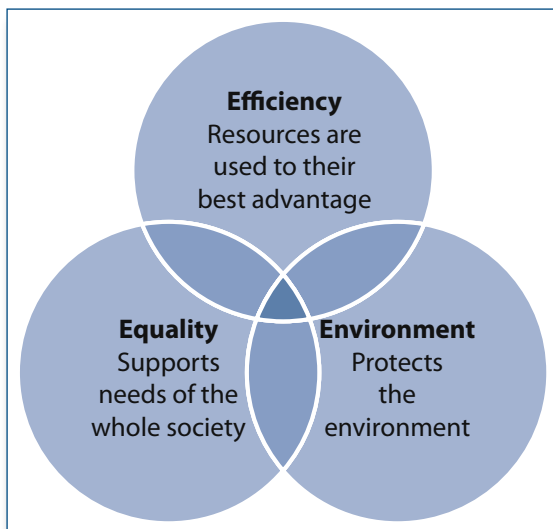
- To finance a sustainable urban transport system; and
- To finance it sustainably.

In other words, it must first be made clear what kind of transport system is being desired; consideration must then be taken in how best to finance the desired system in a way that is financially sustainable. Below we describe these two aspects in turn, before turning to the major barriers currently in place which hinder this challenge to be met.

### 2.1 What is a sustainable urban transport system?

Using the same definition from *Sourcebook Module 5e: Transport and Climate Change*, a sustainable transportation system is one that:

- Allows individuals, companies and societies to meet their basic mobility needs in a way that preserves human and ecosystem health,



**Figure 6**  
*The three pillars of sustainable transport.*

and promotes equity within and between successive generations;

- Is affordable, efficient, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development; and
- Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimising the impact on the use of land and the generation of noise (ECMT, 2004).

*“In short, a sustainable transport system is one that uses resources efficiently to carry people and goods, supports equality of access to support the needs of the whole society, and protects the natural environment.”*

### Box 5: Sustainable urban transport in practice

As described in *Sourcebook Module 5e: Transport and Climate Change*, efficient, equitable and environmentally friendly transport is generally considered to be realised through three approaches:

- Avoiding or reducing trips through e.g. the integration of land use and transportation planning;
- Shifting to more environmentally friendly modes such as public transport and non-motorised transport, or preserving the current modal share of latter modes, particularly in developing countries;
- Improving vehicle and fuel technology of all modes of transport to improve the environmental efficiency from each kilometre travelled.

Many policy makers around the world are already engaging in efforts to realise these approaches, as shown in the pictures below.



**Figure 7**  
*Bus Rapid Transit (BRT) in Jakarta Indonesia, supporting a shift to public transport.*

Photo by Ko Sakamoto, 2009



**Figure 8**  
*Fleet of modern buses in Beijing, China.*

Photo by Manfred Breithaupt, 2006

## 2.2 How can urban transport be financed in a sustainable way?

*“The pursuit of the above sustainable urban transport objectives must be conducted in a manner that is also financially sustainable and economically sound.”*

At a very crude level, financial sustainability is met when revenues are balanced with expenditures, in other words when total intake/income is equal to or exceeds spending.

Maintaining this balance needs to be considered at all levels of decision making, namely:

- Policy level, when deciding on the urban transport budget for the whole city;
- Programme level, in developing a group of projects to support e.g. the rollout of a new network of Bus Rapid Transit;

- Project level, i.e. in executing individual projects under various programmes (e.g. construction of separated bus lanes, purchase of buses).

It is not uncommon for the balance to be temporarily unmet – as is the case when money is borrowed to finance projects and programmes today. However, it is clear that over a longer course of time, the balance needs to be restored in one way or the other.

The funding of infrastructure often becomes financially unsustainable when shortfalls in revenue (e.g. through the under-pricing of infrastructure use and lack of a stable income source) is combined with excesses in expenditure (e.g. through poorly controlled costs, political changes and/or corruption). Investments require up-front funding but it is essential that over the longer term the revenue covers the financing, operating and maintenance costs.

Public transport services often become financially unsustainable due to a combination of

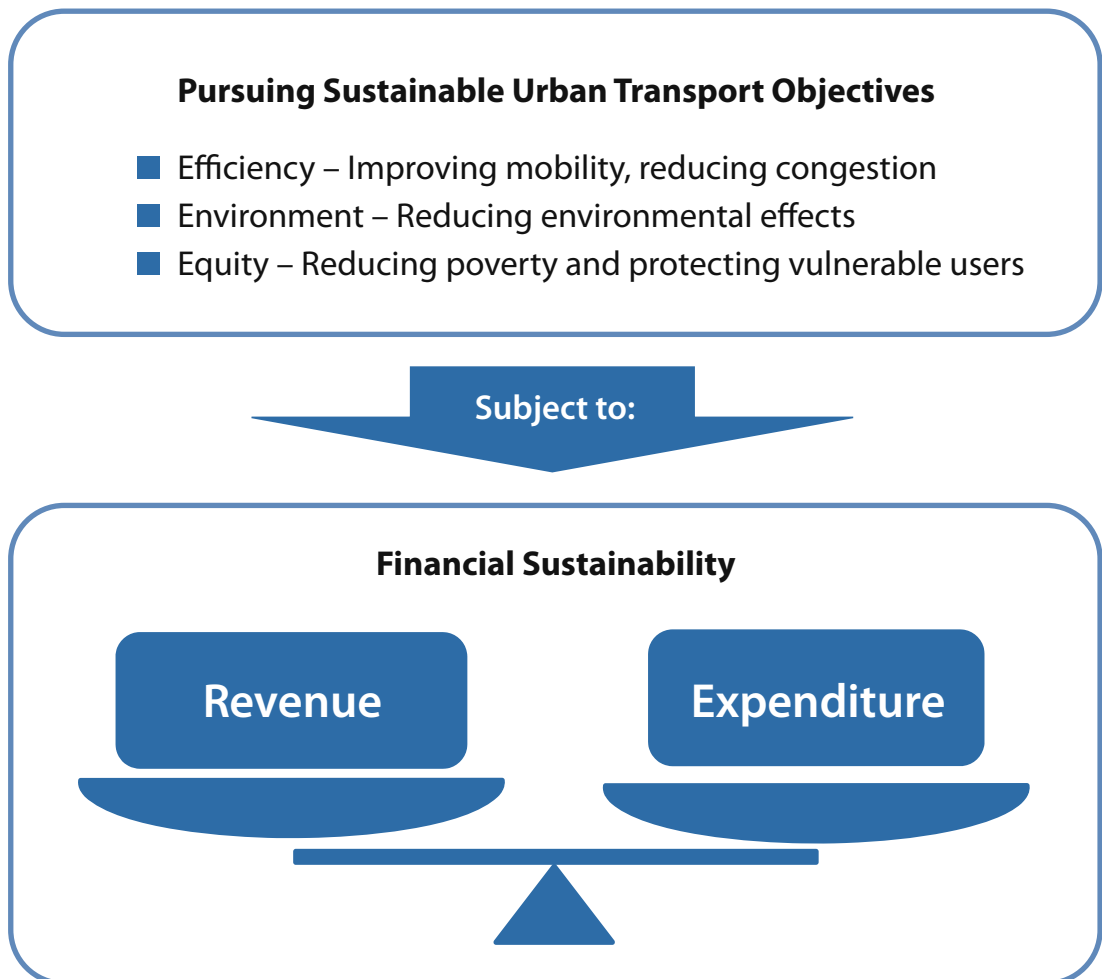


Figure 9  
The challenge of financing urban transport: Financing sustainable urban transport, sustainably.

poorly structured subsidies, improper fare controls, inefficient operations and poor financial management.

In no way is financial sustainability the single condition to ensure that the objectives set out for the city are met – however, it is a necessary condition that enables the pursuit of urban transport objectives described in Chapter 2.1.

Problems with funding are often interlinked and represent/share a larger, underlying problem. This provides the case for a wider and deeper

analysis of the current problems, which may involve consultations and joint working with various stakeholders, including citizens, other government bodies and the private sector. Box 6 provides a number of questions to help assess the financial sustainability of urban transport.

**Box 6: Financial health checker: how sustainable are your transport finances?**

The following questions are designed to help assess the current financial health of the urban transport system, and to point out where efforts may be required to improve financial sustainability of the urban transport system.

Question	Yes	No
<b>Examining the revenues:</b>		
✓ Is there generally enough revenue to cover all expenditures?		
✓ Is the revenue stream stable and predictable, and not prone to frequent fluctuations?		
✓ Are most revenue sources domestic? Is reliance on foreign assistance (ODA, etc.) kept under control, or are there plans to phase out foreign assistance?		
✓ Are there adequate resources to cover both capital investment (infrastructure assets) and revenue funding (to cover maintenance and operations)?		
✓ Can any new sources of revenue be expected in the future, to help bridge any gaps?		
<b>Examining the expenditures:</b>		
✓ Is total spending normally kept within the budget?		
✓ Is there sufficient knowledge of all (potential) costs of the project or programme, including operating, maintenance and procurement costs?		
✓ Is it practice to rank and prioritise spending items, based on a cost-benefit analysis or other type of financial analysis?		
✓ Are financial resources secured before the implementation of a project or programme, to cover the entire duration of the project/programme?		
✓ Are administrative costs kept to a minimum?		
✓ Are (independent) audits in place to check the performance of spent resources?		
✓ Are private contractor costs and performance managed via competitive bidding and performance-based contracts?		
✓ Are there measures to avoid corruption?		

For further information, see: ADB (2010) Financial Sustainability  
[http://www.adb.org/documents/guidelines/eco\\_analysis/financial\\_sustainability.asp](http://www.adb.org/documents/guidelines/eco_analysis/financial_sustainability.asp)

### 2.3 What needs to be financed?

The financing of urban transport requires at a very crude level the coverage of two main aspects, namely:

- **Capital investments for infrastructure** – which are normally expensive, fixed assets such as railways, busways, cycle paths, tram-lines, stations, roads and bridges. This also includes investments in new *technologies*, such as the purchase of vehicles, as well as system-wide technologies such as Intelligent Transport Systems (ITS). Such investments normally require large levels of financial resources, and are often not met solely from local sources. Therefore, the role of national governments and international donors (through the provision of loans and grants, as well as leveraging private capital) become important.
- **Recurrent expenditures** – which require a continuous stream of financial resources long after the capital investments take place. This includes the *operation* of public transport, paratransit and other transport services, the *maintenance* of infrastructure<sup>[2]</sup>, *administrative costs* for city administrations, police, and other public functions, support for *policies*

*and programmes* – such as legislation, regulation and traffic rules, air quality management programmes, safety campaigns, and *traffic management* – including signalling, bus lanes, priority at crossings, etc. Such expenditures should generally be met by users of the transport system (e.g. via road tolls, public transport fares).

These elements must all be supported, in order to enable a sustainable urban transport system and maximise its efficiency. Addressing the current challenges require much more than investing in additional transport infrastructure projects, but rather the re-examination of urban transport as a whole system, and building a financing framework to maximise its potential.

### 2.4 What are the barriers that need to be acknowledged?

The issue of transport finance does not exist in isolation from a wider set of issues that determine the ability for cities to meet the aforementioned goals of developing a sustainable transport system. In reality, the effective financing of a sustainable urban transport system is undermined by various other factors, which need to be fully understood and appropriately managed. These include:

- Trends in economic development;
- Systemic bias towards funding unsustainable transport (e.g. urban highways and flyovers);
- Transport prices that do not reflect true costs;
- Governance and institutional factors;
- Public acceptance.

These are discussed in full below.

#### 2.4.1 Trends in economic development

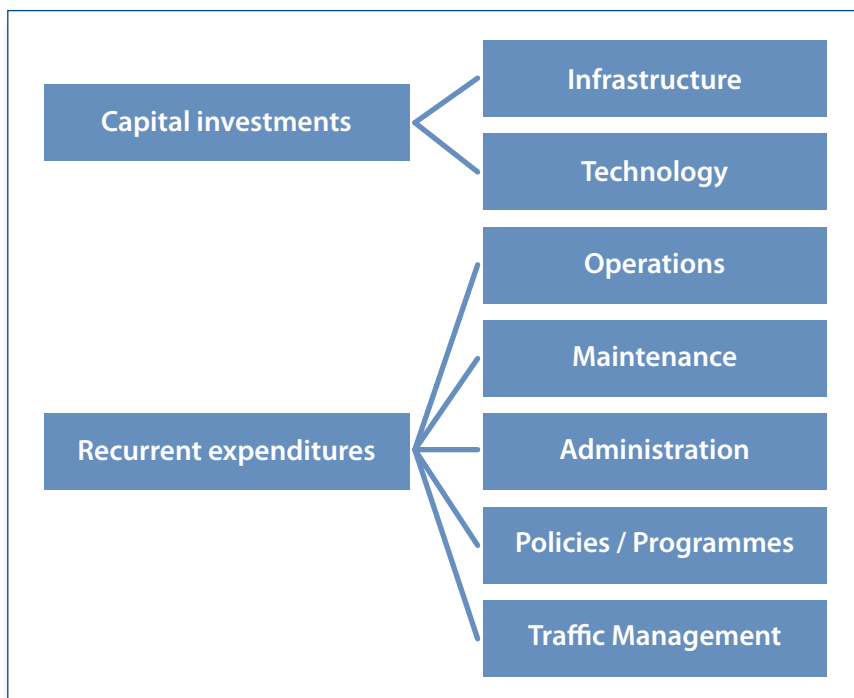
First and foremost, major challenges arise from general development trends, such as rapid income growth and rapid urbanisation<sup>[3]</sup>.

These trends are partly responsible for the shift towards motorised transport (and from

<sup>[2]</sup> This includes rolling stock and vehicles for e.g. public transport.

<sup>[3]</sup> In many countries, there are inadequate planning procedures in place to manage the rapid increase in the urban population. Land use/urban planning is limited or misguided towards encouraging developments (e.g. shopping malls and residential districts) outside of city centres, thereby limiting options for compact, transit oriented development.

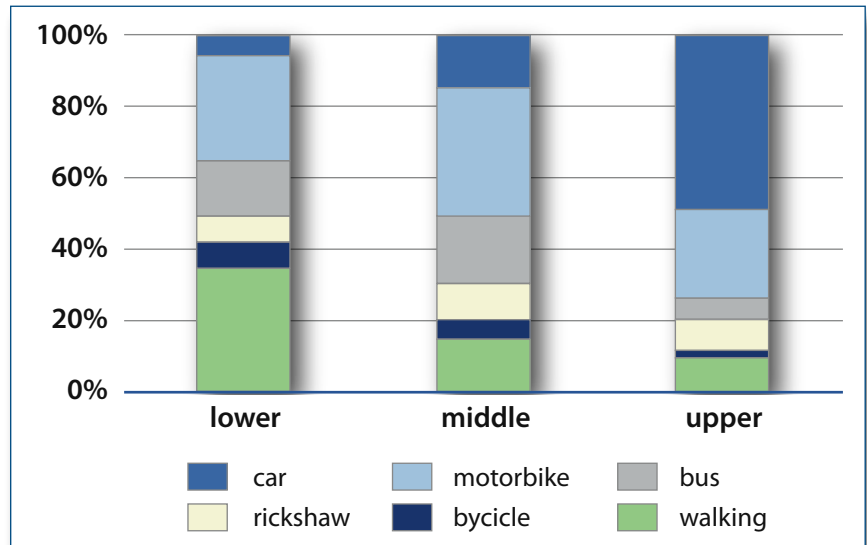
**Figure 10**  
Aspects of urban transport that require financing.



two-wheelers to four wheelers) as well as increases in average trip lengths, with obvious implications on the sustainability of the transport system.

In developing countries, it is not uncommon for vehicle ownership rates to grow by 15–20% per annum. Conversely, the share of public transport is in constant decline.

For example, Figure 11 displays the use of transport modes of lower, middle and higher income classes in Surabaya, Indonesia, showing a strong correlation between income and choice of transport mode<sup>[4]</sup>.



<sup>[4]</sup> In Asia rickshaws for public use are traditionally registered and taxed as taxi cabs, but it is common practice that walkers and cyclists are not subjected to transport taxation. The graph shows that the bulk of the population which may (and must) contribute to urban road financing, are motorised commuters, using buses, motorbikes or cars. The ongoing taxation of these groups will be essential to solve the urban transport problem on a self-supporting and sustainable basis (Metschies, 2005).

This example of Surabaya, as well as those from China (Box 7) shows a story (repeated elsewhere in the world) of growing incomes encouraging a large shift towards private motorised four-wheelers. This means a significant increase in traffic, as well as rising revenues from transport related taxes, fares and charges.

**Figure 11**  
*Modal split by income group in Surabaya, Indonesia.*

Source: GTZ, 2002

### Box 7: Urban transport trends in China

Large cities in China such as Beijing and Shanghai are experiencing rapid economic growth and increases in their urban populations simultaneously (due to endogenous growth and in-migration from rural areas). This is leading to substantial increases not only in average income but also in transport demand and motor vehicle ownership. Most developing cities are not ready yet to provide an efficient urban transport system to cope with this growth in demand and motorisation. This often results in car-dependent suburban sprawl, permanent congestion, air pollution, parking shortages and a lack of mobility for the poor.

Increased investment in recent years has not solved these problems and cities in China now have to consider how to mitigate the negative social and environmental costs of increased motor vehicle use. These costs must be factored into restrictions on car use and car user charges. A shift in emphasis to improving public transport, cycling and walking facilities, new traffic regulations, coordinating land use and transport planning and setting environmental and energy efficiency standards need to be put in place.

In Shanghai, a group of policies aimed at managing transport demand have been put into place,

including public transport prioritisation, limiting and publically auctioning license plates for cars, increasing parking charges in the city centre and controlling motorcycle traffic (bans in certain areas).

Beijing has also started to move towards managing private car use. Beijing's car owners are prohibited from driving one day each week based on the last digit of their license plates. Since traffic jams are still one of the city's most serious problems, the municipal government is planning to extend this restriction until April 2012.

See:

- Pucher, J *et al.*, (2007) Urban Transport Trends and Policies in China and India: Impacts of rapid economic growth [http://policy.rutgers.edu/faculty/pucher/PUCHER\\_China%20India\\_Urban%20Transport.pdf](http://policy.rutgers.edu/faculty/pucher/PUCHER_China%20India_Urban%20Transport.pdf)
- China Daily (3 April 2010) Beijing to extend restriction on car use [http://www.chinadaily.com.cn/china/2010-04/03/content\\_9684096.htm](http://www.chinadaily.com.cn/china/2010-04/03/content_9684096.htm)
- Haixiao, P *et al.*, (2008) Mobility for Development – Shanghai, China (Case Study) [http://www.wbcsd.org/DocRoot/NoTMGIsWnZq9IdUPa564/Shanghai\\_M4D\\_report\\_April08.pdf](http://www.wbcsd.org/DocRoot/NoTMGIsWnZq9IdUPa564/Shanghai_M4D_report_April08.pdf)



### 2.4.2 Systemic bias towards unsustainable modes

The response by governments and donors to the growing demand for transport in developing cities is often to opt for the supply of infrastructure that caters for the growth in motorised modes. This is evidenced in financial, physical and political terms including:

- Investments in large infrastructure projects which are usually road based (*e.g.* urban expressways and flyovers);
- The prioritisation of road space for motorised transport, at the expense of lower or no investments in pedestrian and cyclist facilities;
- Political glorification of mega-infrastructure projects<sup>[6]</sup>;
- Loans and grants from national governments and foreign donors with limited provision for

alternative modes such as public transport and non-motorised transport<sup>[6]</sup>.

This conventional pattern of continuously catering to the ever-increasing demand for private motorised transport is known to exacerbate the problem further, as the availability of roads mean more incentives to drive. Experience has shown that there is no way to increase road-space to match vehicle growth.

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*“Trying to solve traffic problems by building more, bigger roads is like trying to put out a fire with gasoline.”<sup>[7]</sup>*

Enrique Peñalosa, former mayor of Bogotá

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<sup>[6]</sup> This occurs in both developed and developing countries, for example “the Big Dig”, a large urban tunnel scheme in Boston, USA, and large airports such as Suvarnabhumi Airport in Bangkok.

<sup>[6]</sup> This also reflects the fact that requests to *e.g.* foreign donors are made by national governments, whose priorities are often on heavy road infrastructure.

<sup>[7]</sup> See GTZ Sourcebook Module 1a: *The Role of Transport in Urban Development Policy*, p.6 <http://www.sutp.org>.



Figure 12  
*Urban highways  
financed by foreign  
aid in Beijing, China.*  
Photo by Carlos Felipe Pardo, 2006



**2.4.3 Prices that do not reflect the real costs of transport activities**

*“Prices for transport services are currently set without reflection of their full costs, thereby permitting car users to travel without being fully aware of the costs of his/her travel activity.”*

For example, roads are often paid through general taxation, and are to a large extent free at the point of use. Furthermore, the external costs of motorised transport to society, including congestion, accidents, infrastructure wear and tear, air pollution, noise and climate change, are not accounted for.

Fuel prices are not set sufficiently to reflect their effects on the environment. Conversely, they are often subject to low levels of tax or subsidisation. Such practices have sent the wrong signals to

the market and have made motorised transport artificially cheap<sup>[8]</sup>.

Vehicle taxes and charges<sup>[9]</sup> (where they do exist) are also not clearly linked to the external costs of that vehicle. Studies show that the external costs of transport can reach levels of up to 10 % of a city’s gross domestic product, as in the case of Bangkok (World Bank, 2002).

*“International experience shows that efficiency and financial sustainability is best reconciled when the user pays principle is respected.”*

This is whereby the users of transport services bear the associated costs that they create, including those imposed on others. As a general

<sup>[8]</sup> As road based transport so far relies almost entirely on fossil fuels, governments and citizens need to rebalance this by moving towards a more sustainable system which is less dependent on fossil fuels.

<sup>[9]</sup> Developing a vehicle registration and inspection regime is a first step towards effective taxation of vehicles.

**Box 8: The user-pays principle**

The user-pays principle is based on the idea that the cost to provide and maintain necessary infrastructure must be recovered from those who use and benefit most from the service. For transport, this means that the costs of both permanent and recurrent maintenance as well as expansion projects, *i.e.* capital costs, should be financed by charging the users of the infrastructure, in proportion to their use.

Under this approach, users are also required to pay for the costs they impose on others in society, also known as “external costs”. The categories of costs to be covered through this approach are shown in Table 3.

**Table 3: What costs are imposed by the motorist?**

Own costs	External costs
<ul style="list-style-type: none"> <li>■ Time costs</li> <li>■ Vehicle operating costs (e.g. fuel, vehicle tax, insurance, wear and tear)</li> <li>■ Own accident costs</li> </ul>	<ul style="list-style-type: none"> <li>■ Congestion</li> <li>■ Accidents</li> <li>■ Infrastructure wear and tear</li> <li>■ Air pollution and associated health costs</li> <li>■ Noise and vibration</li> <li>■ Climate change</li> </ul>

In practice, there are important instances in which deviation from a strict interpretation of the user pays principle is justified. For example:

- When private car users do not pay for all of their external costs, public transport services may receive compensation (as subsidies) to “level” the playing field.
- Discounts and subsidies may be required for vulnerable members of society, including the poor, elderly and mobility impaired.

For more information on how to implement the user pays principle in practice, see: GTZ Sourcebook Module 1d: *Economic Instruments* <http://www.sutp.org>.

rule, transport users must pay for the services they receive, just as a person would pay a restaurant for the catering he/she receives (see Box 8).

#### 2.4.4 Governance and institutional factors

Furthermore, some barriers are attributable to the way in which urban transport institutions

are currently set up and governed. In many developing cities, there is generally a lack of institutional capacity to raise and manage funding at a local level, and administer transport services adequately. City administrations are often cash strapped, and responsibilities between transport-related agencies blurred. Corruption is also evident in many parts of the system.

The weaknesses in institutions and governance translate into the fragmentation of urban transport as a system. World Bank (2002) and others note the following main issues which are evident in developing cities:

#### Box 9: Lack of institutional coordination in Bangkok, Thailand

Bangkok is an example of a city that has not managed to organize urban transport in a way that provides the level of mobility required by a city of its size and status. Historically the Government has been too closely involved in the provision of transport infrastructure and services through a variety of state-owned agencies. Operations were therefore excessively vulnerable to changes of political direction, the imposition of ill-defined and incompatible objectives, and bureaucratic and budgetary constraints.

In 1999, at least 27 government departments, agencies and state owned-enterprises exercised responsibilities related to urban transport. Under such arrangements, an urban transport policy initiative, developed by one level of government or agency, is therefore frequently blocked by another level of government (or agency) with overlapping or related authority, leading to institutional gridlock. This example shows the relevance of a coordinated and well structured institutional body.

See: GTZ Sourcebook Module 1b: *Urban Transport Institutions* <http://www.sutp.org>



**Figure 13**  
*Serious traffic problems in Bangkok, Thailand.*

Photo by Armin Wagner, 2008

#### Box 10: The costs of corruption

According to the World Bank, the cost of corruption (across all sectors) is estimated at USD 80 billion worldwide.

In road transport projects, resource losses due to corruption are thought to reach 3–15 % at the point of awarding contracts, and a further 10 to 20 % on allocations within contracts. On average, a total of around 35 % of the contract value of a road project may be lost in this way.

Peterson, G (2005) notes that a comprehensive agenda is required to reduce corruption, including:

1. Understanding corruption risks (Mapping)
2. Changing institutional incentives
3. Providing effective institutional tools
4. Improving transactions & implementation
5. Empowering civil society & recipients
6. Improving oversight: by government, civil society, Bank
7. Defining & announcing remedies

See:

- World Bank (2009) *Deterring Corruption and Improving Governance in Road Construction and Maintenance* [http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1229359963828/TP-27\\_Governance\\_Sourcebook.pdf](http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1229359963828/TP-27_Governance_Sourcebook.pdf)
- Campos, J and Pradhan, S (2007) *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level* [http://www.u4.no/pdf/?file=/document/literature/publications\\_adb\\_manyfacesof-corruption.pdf](http://www.u4.no/pdf/?file=/document/literature/publications_adb_manyfacesof-corruption.pdf)

- Separation of infrastructure and operations – whereby infrastructure provision takes little account of how it may support transport services. This makes it difficult for the city to encourage the growth of public transport, *e.g.* the development of high-speed bus routes.
- Fragmented responsibilities for (poor integration of) different modes – whereby for example institutions responsible for road transport are detached from rail and other modes of transport, leading to poor integration and conflicts in priorities.
- Separation of infrastructure provision and pricing – whereby the institutions that build infrastructure are incapable of setting the prices of using that infrastructure (*e.g.* in the form of user charges). This makes investment decisions ad-hoc and poorly coordinated.

#### 2.4.5 Public acceptance of financing instruments

Social and political acceptance of the different financing instruments is of central importance to generate revenues sustainably. If poorly planned, the implementation of these instruments can be foiled through public resistance.

New charges are always unpopular, and most voters tend to be more aware of the disadvantages than benefits of a particular policy. Information and transparency are the most important tools to dispel public mistrust in “another tax raise”.

Experience has shown that public acceptance of financing instruments such as pricing schemes can be substantially enhanced by:

- Earmarking the funds that are collected explicitly for additional urban transport improvements – for example, the introduction of a vehicle licence fee may be combined with measures to improve the frequency of bus services and other forms of public transport.
- Ensuring that schemes are fair to the public – if there are impressions that some groups are favoured, resistance can be expected. Impacts on vulnerable members of society must be taken into account. Low income groups may suffer if prices for transport are determined entirely based on market

competition. Transparent subsidies for public transport are required, as well as other forms of income-dependent transport charging, for example calculating vehicle taxes according to their market value.

- Clear communication – for example the user-pays principle, where the users of transport services carry the associated costs (explained in detail in Section 2.4.3) is likely to be the fairest solution to collect funds to finance transport, as there are no distortions and the system is fairer than all alternatives that charge all taxpayers or only specific user groups. Clear communication via public relation campaigns should be used to highlight that the cost of road construction and maintenance must ultimately be paid by someone and that otherwise, other tax burdens would increase or levels of service would decrease.

General Information and many best practices on the design and implementation of public awareness campaigns and consensus-building methods for a civil society stakeholder dialogue can be found in:

- GTZ Sourcebook Module 1e: *Raising Public Awareness about Sustainable Urban Transport* <http://www.sutp.org>

#### Box 11: Checklist of issues to increase political acceptability

- ✓ Thoroughly consider the redistributive consequences of changes in pricing;
- ✓ Ensure a high level of transparency and communication to the public to build trust;
- ✓ Communicate the fairness of the user-pays principle, and ensure the public understands the hidden cost of regressive and inefficient subsidies;
- ✓ Consider earmarking revenue from taxes and charges for a specific purpose, so that the payers directly perceive the benefits;
- ✓ Learn from public relation campaigns (*e.g.* those which accompanied the introduction of Road Funds);
- ✓ Make incremental changes in price levels, *e.g.* for fuel, (only 3–10 % at a time) and repeat this frequently (for example every six months) until a sustainable price level is reached.

**Box 12:**  
**Overcoming political unacceptability – case of fuel subsidy reform in Ghana**

Ghana is one country which has managed to eliminate its fuel subsidies in recent years.

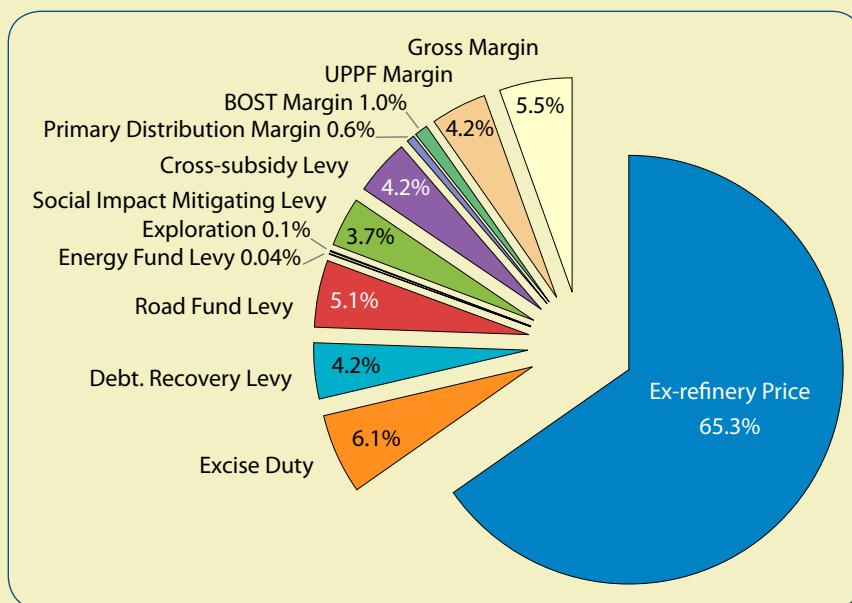
Prior to 2003, fuel prices were heavily regulated and subsidised (at the refinery stage), in an attempt to keep pump prices low. The increasing costs of imported fuel nearly forced into bankruptcy the state-owned company responsible for refining imported crude oil and selling them on to Oil Marketing Companies (OMCs) for distribution and retail.

In 2003, Ghana began a programme of deregulating the petroleum sector, including the abolishment of all subsidies on fuel, and increasing competition at

the importation and refinement stages. As a result, the price of gasoline (at the pump) increased by more than 600% between 2000 and 2008.

To partially offset the negative impacts on consumers, the government also enacted a number of measures including subsidies for bus transport, capitation grants, a school feeding programme, and an affordable housing scheme. Such programmes are financed by a levy placed on the fuel, known as the Social Impact Mitigation Levy. This constitutes approximately 3.7% of the price of gasoline at the pump.

Various other levies are placed on fuel, whose purposes range from cross-subsidising certain petroleum products, to providing funding for roads (see Figure 14).



**Figure 14**  
*Fuel Taxes and Margins on Premium.*

Source: NPA, 2008.

See:

- Modern Ghana (May 2008) New Fuel Prices Loom. <http://www.modernghana.com>
- Energy Information Administration (EIA) (2008) International Energy Data and

- Analysis-Ghana. [http://tonto.eia.doe.gov/country/country\\_time\\_series.cfm?fips=GH](http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=GH)
- GTZ International Fuel Prices (2009) <http://www.gtz.de/fuelprices>

**Box 13: Questions and actions from Chapter 2:  
Understanding the main challenges and barriers**

The following questions and actions may help guide the process of identifying and overcoming the main challenges and barriers faced by policy-makers.

Questions 	Actions
<ul style="list-style-type: none"> <li>■ Is there a local transport strategy, and does it incorporate elements of sustainability, <i>i.e.</i> efficiency, equity and environment?</li> <li>■ Which aspects lack consideration at the moment?</li> </ul>	<ul style="list-style-type: none"> <li>■ Ensure that there is a local transport strategy.</li> <li>■ Review and revise the local urban transport strategy to ensure full coverage of sustainability objectives.</li> </ul>
<ul style="list-style-type: none"> <li>■ Are the financing instruments currently being used financially sustainable?</li> <li>■ Is the revenue/expenditure stream stable, and do the instruments take into account their political acceptability and administrative burden?</li> </ul>	<ul style="list-style-type: none"> <li>■ Use instruments which guarantee a stable income (see Chapter 3). Improve political acceptability through means explained in Box 11.</li> <li>■ Choose instruments that impose less administrative burden, and strengthen institutions responsible for administering funding.</li> </ul>
<ul style="list-style-type: none"> <li>■ How do external developments such as rapid urbanisation and income growth affect transport?</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand how external factors may influence the demand for transport (see EEA, 2008).</li> <li>■ Ensure developments in other sectors of the economy do not add unnecessary demand for transport, through sound urban planning (see Footnote 3).</li> <li>■ Place land-use planning at the heart of the transport strategy.</li> </ul>
<ul style="list-style-type: none"> <li>■ How much of the current transport budget is used to finance unsustainable forms of transport?</li> </ul>	<ul style="list-style-type: none"> <li>■ Review the way projects are formulated and approved (<i>e.g.</i> option generation and appraisal) so that they fully incorporate sustainability as an objective.</li> <li>■ Redirect funding towards sustainable modes such as walking and cycling fully integrated with public transport systems.</li> </ul>
<ul style="list-style-type: none"> <li>■ How are transport activities currently priced?</li> <li>■ Do users pay the full costs of their actions, including external costs?</li> </ul>	<ul style="list-style-type: none"> <li>■ Ensure that the user-pays principle is well understood and applied, using instruments such as fuel tax, vehicle tax and road pricing (see Section 3.6.1).</li> <li>■ Eliminate harmful subsidies, for example on fuel.</li> </ul>
<ul style="list-style-type: none"> <li>■ Does the current institutional setup hinder the implementation of a well integrated and sustainable urban transport system?</li> </ul>	<ul style="list-style-type: none"> <li>■ Consider combining the institutions into a unified body responsible for the planning, implementation and management of transport services.</li> </ul>

### 3. Approaches towards a sustainable system

The previous chapter outlined the main goal for financing urban transport, namely to:

- Finance a sustainable urban transport system which is efficient, equitable and environmentally friendly; and

- Finance it sustainably – ensuring that revenues and expenditures are balanced at policy, programme and project level.

This chapter provides the key steps in moving towards this goal. The approach involves three steps; understanding the financing needs for a sustainable urban transport system, understanding the various financing options/mechanisms and combining the options/mechanisms effectively.

These three steps are described further in the sections below.

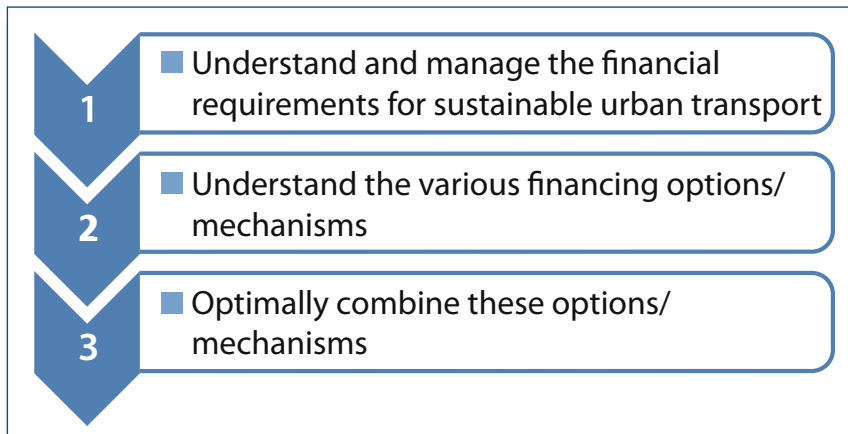


Figure 15  
*Three steps towards financing sustainable, urban transport.*

#### 3.1 Understanding and managing the financial requirements for sustainable urban transport

The first step towards reaching the aforementioned goal is to understand the financing needs – *i.e.* estimating the resources required to finance all of the key aspects of urban transport described in Chapter 2, namely:

- **Capital investments** for infrastructure and technology, as well as
- **Recurrent expenditures** to cover operations, maintenance, administrative costs, policies and programmes and traffic management.

The estimation of such requirements must be embedded within:

- A holistic decision-making process for estimating the costs and benefits of transport schemes, fully taking into account their social and environmental impacts.
- A robust framework for estimating/forecasting the potential expenditures and revenues throughout the entire lifetime of the programme or project, taking into account any risks.

- A transparent and fully accountable system of monitoring costs.<sup>[10]</sup>

The below examples of Singapore and London provide a practical idea of what the above two categories of expenditures entail.

Beginning with Singapore, a large amount of the city's transport expenditure (more than 90 %) is allocated to capital investments and land related expenditures. The real consists of operating expenditures, which includes items such as supplies, services and staff costs (see Figure 16).

In the case of London (and its transport authority Transport for London – TfL), the expenditure profile is significantly different, with only around one fourth of the annual expenditure being in capital spending. Although these two expenditure profiles are not directly comparable,

<sup>[10]</sup> A detailed account of expenditures (costs) can help identify trends and improve budget forecasts. It can also highlight cost items which need to be better managed, if they are seen to be growing disproportionately in relation to other costs.



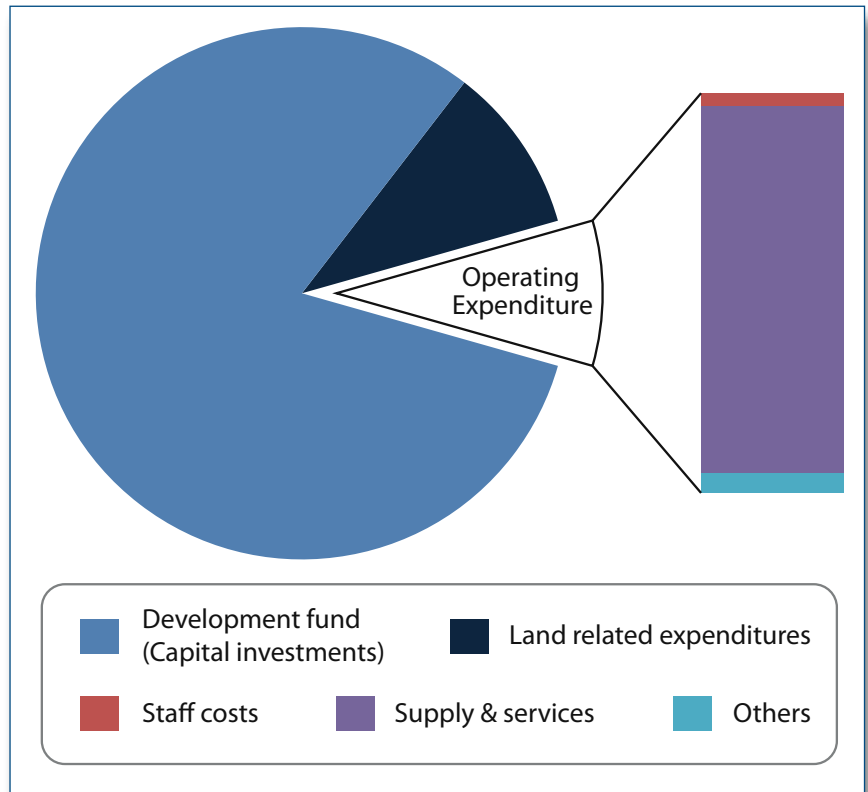
they portray the large differences that can exist between cities and regions, and the importance of fully understanding the local characteristics<sup>[11]</sup> of the expenditure portfolio, in order to prudently finance the required items (see Figure 17).

Regardless of their differences, both Singapore and London provide accurate and consistent accounting for their transport expenditures. This provides a strong basis for:

- Assessing any potential *shortfalls or gaps in funding* that may need to be addressed; and
- Identifying trends in *expenditure increases* which may jeopardise financial sustainability.

The following sections provide ideas of how these two issues can be further examined in a developing city context.

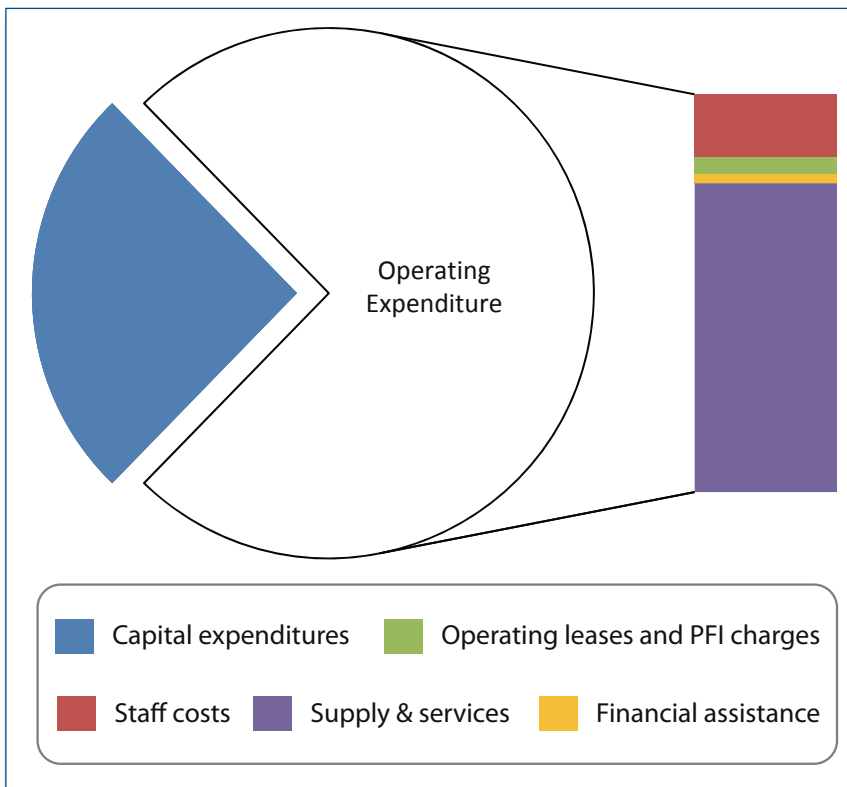
Firstly, Table 4 provides a summary checklist that could be used, in assessing the current level and appropriateness of financing for the various components of urban transport. The list can be used to diagnose areas where currently financing is lacking, either partially or completely.



**Figure 16**  
*Expenditure of Singapore's Department of Transport in 2008.*

Source: Singapore Government, 2010

<sup>[11]</sup> In the above examples of Singapore and London, the former continues to increase its network capacity, whereas in London, the focus is on operating and maintaining the existent network which is to a large extent already in place.



**Figure 17**  
*Expenditure of Transport for London for fiscal year 2008-2009.*

Source: TfL, 2010a

Table 4: Identifying financing gaps

Dimension	Key Question	Criteria	Example of good practice
Policies/ programmes	<ul style="list-style-type: none"> <li>Are there adequate resources to develop and implement policies?</li> </ul>	<ul style="list-style-type: none"> <li>Funds are set aside for formulating an urban transport strategy</li> </ul>	<ul style="list-style-type: none"> <li>Mobility strategy of Bogotá</li> </ul>
Institutions/governance	<ul style="list-style-type: none"> <li>Are there enough resources to recruiting and training professional staff?</li> <li>Are staff adequately compensated to carry out their tasks and not prone to corruption?</li> <li>Are there resources available to allow communication and joint working between the various institutions/stakeholders?</li> </ul>	<ul style="list-style-type: none"> <li>Mechanisms are in place to allow continued professional development</li> <li>Staff are rewarded on merit and at competitive rates</li> <li>Allowance is made for meetings and consultations amongst stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>The Land Transport Authority (LTA) of Singapore</li> </ul>
Traffic management	<ul style="list-style-type: none"> <li>Is there currently enough consideration for traffic management?</li> <li>Is there provision of resources for traffic management?</li> </ul>	<ul style="list-style-type: none"> <li>Traffic management and enforcement is recognised within the transport budget</li> </ul>	<ul style="list-style-type: none"> <li>Electronic road pricing in Singapore</li> <li>Congestion charge in London</li> </ul>
Infrastructure and maintenance	<ul style="list-style-type: none"> <li>Is there enough support to fund transport infrastructure, particularly those for pedestrians and cyclists?</li> <li>Is there a mechanism that ensures a stable source of revenue for maintaining the infrastructure?</li> </ul>	<ul style="list-style-type: none"> <li>Option generation and appraisal incorporate sustainability objectives</li> <li>10 US cents per litre of fuel or equivalent is set aside for maintenance as a rule of thumb</li> </ul>	<ul style="list-style-type: none"> <li>Road maintenance funds in South America and Africa</li> <li>Special local road fund in the Philippines</li> </ul>
Operations	<ul style="list-style-type: none"> <li>Are there resources to fund a high quality public transport service?</li> <li>Is the role of the private sector fully acknowledged?</li> <li>Are public transport subsidies funded by financially sustainable sources?</li> </ul>	<ul style="list-style-type: none"> <li>The correct regulatory scheme is in place</li> <li>Subsidies are targeted, not spread across the system</li> </ul>	<ul style="list-style-type: none"> <li>Bus franchising in London, Hong Kong and Singapore</li> </ul>
Technology	<ul style="list-style-type: none"> <li>Is Research and Development adequately funded?</li> <li>Is technology that enables sustainable transport affordable?</li> </ul>	<ul style="list-style-type: none"> <li>Potential of low-cost technologies are exploited (e.g. non-motorised transport)</li> </ul>	<ul style="list-style-type: none"> <li>Bicycle taxis in Kenya/Uganda</li> <li>Low floor buses made by Indian vehicle manufacturers</li> </ul>

Second, the Box 14 shows how expenditure increases can be controlled, by understanding the risks involved with transport programmes and projects, and building in incentive structures through subsidies and procurement rules to increase cost effectiveness.

### Box 14: Managing expenditures

#### Expenditure overruns are not uncommon

Overruns in expenditure have been shown to occur in a significant number of transportation investment projects. Flyvbjerg, B *et al.*, (2003) notes that substantial cost escalation is the rule rather than the exception. In the rail industry, for example, the average cost overrun is 45 %, for fixed links (tunnels and bridges) it is 34 % and for roads 20 %. Cost overruns appear to be a global trend, occurring across 20 nations on five continents. Some examples include Boston, USA Central Artery (estimated USD 6 billion, actual USD 14.6 billion = 143 % overrun); Tokyo, Japan Oedo Subway (estimate JPY 682.6 billion, actual 1,400 billion JPY = 105 % overrun); and UK-France Channel Tunnel (Estimate GBP 2.6 billion, actual GBP 4.65 billion = 79 % overrun).

#### An accurate understanding of risk is central to managing expenditures

A good starting point is to incorporate the risk of cost overruns in transportation project evaluation and decision making, *e.g.* through systematically checking and correcting for over-optimistic forecasts on project performance (*e.g.* ridership of public transport). Decision-makers and planners should always plan for delays and long implementation phases which translate into substantial cost escalations. This is particularly important for larger projects which have a larger impact on the transport budget if their expenditures are not controlled. Funding partners must understand and tolerate the existence of uncertainty and project managers should rely on sound data and evidence to make judgements.

#### Further incentives can be provided to contain costs

To manage costs further, subsidies and procurement procedures can be better designed so that payment for contractors can be linked to actual progress and performance. Performance Based Contracts (PBC), where the payment to the contractor is based on the amount of inputs (*e.g.* cubic meters of asphalt concrete, number of working hours), are gradually becoming more common across many countries. This approach can potentially achieve cost savings from 10 – 40 % and a multi-year financing of a maintenance program.

See:

- Lewis-Workman (2010) Predicted vs. Actual Costs and Ridership – Urban Transport Projects
- Flyvbjerg, B *et al.*, (2003) How common and how large are cost overruns in transport infrastructure projects? <http://www.informaworld.com/smpp/content~db=all~content=a713868295~frm=abslink>
- Berechman, J and Chen, L (2010) Incorporating Risk of Cost Overruns into Transportation Capital Projects Decision-Making <http://massetto.ingentaselect.co.uk/fstemp/0e2a5a16ece5dbdf575985a14311523d.pdf>
- Stankevich, N *et al.*, (2005) Performance-based Contracting for Preservation and Improvement of Road Assets [http://sitere-sources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1231943010251/trn-27\\_PBC\\_Eng\\_2009.pdf](http://sitere-sources.worldbank.org/INTTRANSPORT/Resources/336291-1227561426235/5611053-1231943010251/trn-27_PBC_Eng_2009.pdf)

### 3.2 Understanding the various financing options/mechanisms

Once the areas which are inadequately or improperly funded are identified, and incentives created to minimise unnecessary expenditures, an appropriate set of financing instruments must be selected to plug the gap and improve support for sustainable transport.

*“Financing instruments are available at local, regional/provincial, national and international level.”*

In the sections that follow, we provide a short introduction to the most representative instruments from each of these groups.

The majority of financial instruments that are available at local and national levels are those which have a history of use within the transport sector, whereas those at the international level include innovative instruments that have lately been conceived with the specific intention of

promoting environmental objectives, particularly climate change mitigation.

More often than not, instruments will overlap, interact, and in some cases be transferred amongst the actors involved. It is therefore vital that a common understanding of the various options is formed amongst all levels.

For each instrument discussed in the following chapters, a table such as the one below is provided which summarises all relevant information at a glance including:

- Their basic attributes (*i.e.* administrative level, amount of resources concerned, what aspects of transport it may fund);
- Its potential contribution to the three aspects of sustainable urban transport (*i.e.* efficiency, equity, environment);
- Its contribution to financial sustainability (*i.e.* stability, political acceptability and administrative ease);
- Key examples in practice;
- The main decision-makers involved;
- Main considerations for policy makers.

**Table 5: Example summary table of a financing mechanism**

Basic attributes		Support for sustainable transport	
Administrative level	National	■ Efficiency	+++
Amount	\$\$\$	■ Equity	+++
What can it fund?	Infrastructure Maintenance Public transport	■ Environment	+++
Examples		Support for financial sustainability	
Singapore		■ Stability	+++
		■ Political acceptability	+
		■ Administrative ease	+++
Main Decision-makers		Main considerations for policy makers	
Finance ministry/treasury		■ <i>Considerations for policy makers will be provided here</i>	
Transport ministry			
Environment ministry			
Mayor/city administration			
Local Transport authority			
Enforcement authority			
Private sector operators			
Businesses			
International organisations			
NGOs, media and civil society			

The relative amount of resources and level of contribution to the objectives is expressed as one, two or three dollar signs (\$) or stars (+). Note must be taken that these are provided as indicative, and that exact amounts will differ by local context.

In selecting which instruments to use, it is also important that the instruments, or set of instruments are supportive of the overall sustainable urban transport strategy, whilst also contributing to financial sustainability.

The questions listed in Table 6 act as a guide as to how the financing mechanism may help meet these goals.

See Section 3.6 for further discussion on how individual instruments should be combined, as well as Table 18 and Table 19 at the end of this document for an overview summary of these instruments.

**Table 6: Questions for seeking the appropriate financing mechanism**

Issues to consider	Main questions	Criteria	Example of good practice
<b>In supporting sustainable transport objectives</b>			
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>Does the instrument support the user-pays principle?</li> <li>Does the instrument create unnecessary distortions in the economy?</li> </ul>	<ul style="list-style-type: none"> <li>Prices reflect the full costs of travel/transport, including external costs</li> </ul>	<ul style="list-style-type: none"> <li>Road pricing with differentiated charges according to location and time of day (Singapore)</li> </ul>
<b>Equity</b>	<ul style="list-style-type: none"> <li>Are revenues collected fairly (<i>i.e.</i> those who benefit carry the costs)?</li> <li>Is the instrument progressive and supportive of the poor?</li> </ul>	<ul style="list-style-type: none"> <li>Equality impact assessments are used in decision making.</li> <li>Basic transport services are at affordable levels</li> </ul>	<ul style="list-style-type: none"> <li>Business taxes/charges earmarked for public transport provision (Brazil and France)</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Does the instrument help move towards a sustainable urban transport system?</li> </ul>	<ul style="list-style-type: none"> <li>The instrument helps internalise external costs</li> <li>Revenue is used for sustainable transport modes/strategies</li> </ul>	<ul style="list-style-type: none"> <li>Congestion charge with revenue used to improve bus service quality and increase share of public transport (London)</li> </ul>
<b>In supporting financial sustainability</b>			
<b>Stability</b>	<ul style="list-style-type: none"> <li>Is the revenue from the instrument stable across time, and therefore support long-term planning?</li> </ul>	<ul style="list-style-type: none"> <li>Revenue is robust against economic cycles, seasons and events</li> </ul>	<ul style="list-style-type: none"> <li>Fuel taxes with low levels of fluctuation in demand</li> </ul>
<b>Political acceptability</b>	<ul style="list-style-type: none"> <li>Is the instrument acceptable to the public?</li> <li>Can there be ways to improve acceptability to the public?</li> </ul>	<ul style="list-style-type: none"> <li>The public understands the intention of the instrument due to clear and transparent communication</li> <li>The public perceives the benefits of payment</li> </ul>	<ul style="list-style-type: none"> <li>Automobile-related taxes earmarked for transport use (Japan)</li> </ul>
<b>Administrative ease</b>	<ul style="list-style-type: none"> <li>How much does it cost to administer the instrument?</li> <li>Does an excessive proportion of the revenue get “swallowed” in the administration?</li> </ul>	<ul style="list-style-type: none"> <li>Administrative costs of running the scheme do not exceed a significant portion of revenue.</li> </ul>	<ul style="list-style-type: none"> <li>Fuel taxes which can be collected at very low administrative cost (valid worldwide).</li> </ul>

### 3.3 Financing instruments at local level

#### 3.3.1 Parking charges

Basic attributes		Support for sustainable transport	
Administrative level	Local	■ Efficiency	+++
Amount	\$	■ Equity	+++
What can it fund?	Maintenance Public transport Institution Traffic management	■ Environment	++
Examples		Support for financial sustainability	
Sibiu – differentiated charging rates Nottingham – Workplace levies		■ Stability	++
Main Decision-makers		■ Political acceptability	+
Finance ministry/treasury		■ Administrative ease	+
Transport ministry		Main considerations for policy makers	
Environment ministry		■ Use parking charges as a proxy to road pricing	
Mayor/city administration	X	■ Ensure engagement from private parking space owners and businesses to create a coherent approach	
Local Transport authority	X		
Enforcement authority	X		
Private sector operators			
Businesses	X		
International organisations			
NGOs, media and civil society			

*“Almost all urban areas have space for car parking, often both on- and off-street. This makes charging for their use an effective way of generating a steady revenue stream.”*

Parking charges are often used in place of direct road user charges, and their ability to be differentiated by time and place makes them an appropriate demand management measure that can be altered to internalise some of the negative externalities generated by the mode.

Not all cities charge for the use of parking facilities however, and parking is often subsidised. Even where charges are applied there is a tendency for them to be undercharged, which leads to an inefficient allocation of space in urban areas.

The ability of local government to charge for parking is limited to the parking spaces that are owned (or regulated) by the public sector, but their potential to support urban transport schemes should not be underestimated.



**Box 15: Parking management in Sibiu, Romania**

The control and restriction of private vehicular traffic in the old town centre in Sibiu was facilitated by a new traffic management system initiated by GTZ. The system provides for pedestrian zones, one-way streets and defined parking zones. Through this scheme, Sibiu maximises the potential for parking charges to act as a demand management mechanism by differentiating charging rates across the city. The charging rate for parking in the city centre is 50% higher than in peripheral areas. To maximise the impact, parking in the central area is limited to four hours. The time limit can be overridden by companies and public organisations, however, subject to a one-off payment, which further increases revenues received.



**Figure 18**  
*Parking in Sibiu, Romania.*

Photo by Manfred Breithaupt, 2007

See:

- GTZ (2003) Redevelopment of the old city in Sibiu: new car park system <http://www.gtz.de/en/themen/26302.htm>
- ELTIS (2008) Parking in the Historical Centre of Sibiu, Romania [http://www.urbantransport.eu/PDF/generate\\_pdf.php?study\\_id=1810&lan=en](http://www.urbantransport.eu/PDF/generate_pdf.php?study_id=1810&lan=en)

The cost of implementing parking charging schemes can vary greatly depending on the nature and level of provision.

*“As with road user charging, the level of flexibility afforded by the mechanism should be exploited to maximise the efficiency of the parking charges.”*

Parking charges can vary based on geographical area, day, time, duration of stay and emissions generated from each vehicle. In association with other measures increasing parking charges in city centres can, for example, reduce congestion and promote public transport use. Studies show that charges differentiated to impact commuters and to increase at peak times are likely to have the greatest impact upon travel behaviours (Toner, 2005). This highlights the fact that parking charges can be used as a demand management strategy despite the fact that demand for parking tends to be relatively inelastic.

Furthermore, on-street parking charges should if possible be higher than off-street charges as this will act as an incentive for people to park off-street, rather than look for a cheaper (as well as more convenient) on-street space.

**Figure 19**  
*On-street parking in Pune, India.*

Photo by Jeroen Buis, 2008



*“As a rule-of-thumb parking fees per hour should be higher than a single bus fare in order to encourage the use of public transport.”*

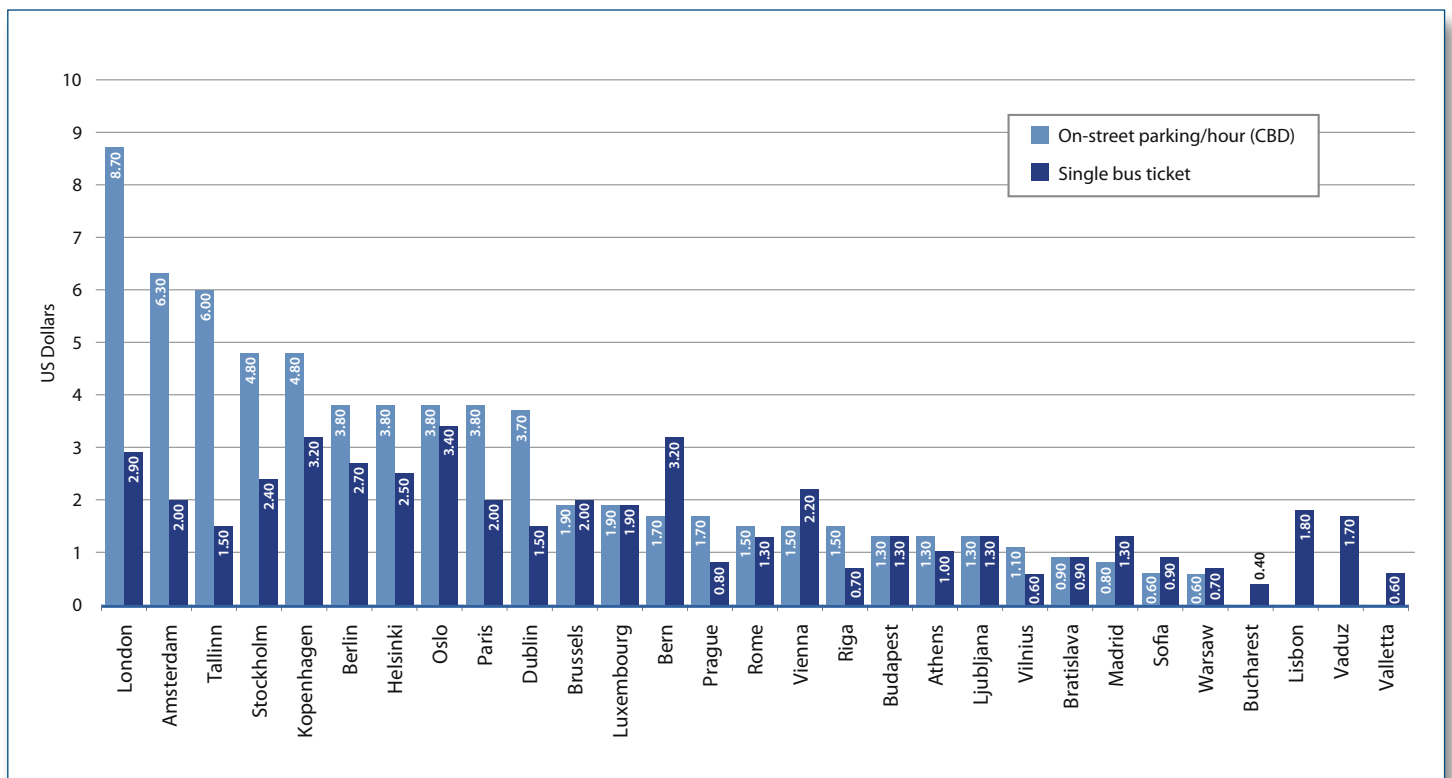
Figure 20 compares parking fees per hour in European capitals (in Central Business District, 1 hour on-street parking). Further, single bus fares are indicated as comparison.

*“Additional finance can also be raised from schemes such as workplace parking levies.”*

In some countries legislation is in place which enables local authorities to charge companies

and organisations for each commuter car parking space provided in a specified work place. The revenues raised can be reinvested locally, and the flexibility to tailor the scheme specification as required means that exemptions can be made to certain types of employees or vehicles.

Workplace parking levies can be implemented relatively easily meaning that funding can be generated after a short period of time. Their acceptance is strongly linked to whether options other than using private cars are promoted (e.g. commuter passes for public transport, car sharing and arrangements to enable teleworking). Experience in places such as Nottingham in the UK has shown that opposition from businesses to these schemes can have a strong negative impact upon their implementation and therefore political will to do so is crucial.



**Figure 20**  
*Comparison of parking fees in European Cities – On-street per hour, CBD, with costs of a single bus fare.*

GTZ, 2008

**Box 16: Insufficient parking charges in Jakarta, Indonesia**

According to a global parking rate survey in central business districts, Jakarta is the second-cheapest world city in which to park. Jakarta’s average monthly parking fee is USD 27.20. Only Mumbai is cheaper with only USD 25.68.

The official parking fees in Jakarta have not been altered since the 2004 gubernatorial decree which regulates the indoor parking charges in Jakarta.

Indoor parking spaces and multi-story parking lots for cars and minibuses cost USD 0.22 for the first hour and USD 0.11 for each following hour. The tariff for buses is USD 0.22 for the first hour and USD 0.22 for each following hour, while motorcycles are charged USD 0.08.

The low current parking charges show that this instrument has not been used to address the transportation problems in the city. However there is a huge potential in raising parking fees to limit the number of private cars and reduction of congestion.



**Figure 21**  
*On-street motorcycle parking in Jakarta, Indonesia.*

Photo by Manfred Breithaupt, 2005

See:

- Jakarta Post (2009) Parking fees in Jakarta the second-lowest worldwide  
<http://www.thejakartapost.com/news/2009/07/03/parking-fees-jakarta-second-lowest-worldwide.html>
- Jakarta Post (2010) Operators reject city’s call to display official parking fees  
<http://www.thejakartapost.com/news/2010/03/09/operators-reject-city%E2%80%99s-call-display-official-parking-fees.html>
- Jakarta Post (2010) The ongoing saga of parking fees  
<http://www.thejakartapost.com/news/2010/03/11/letter-the-ongoing-saga-parking-fees.html>

**Box 17: Workplace parking levies in Nottingham, UK**

The UK Transport Act 2000 paved the way for a workplace parking levy scheme. Nottingham City Council has now confirmed its plans to introduce an annual levy per workplace parking space. This instrument will be used to develop a revenue stream from measures that manage respectively reduce traffic and encourage modal shift.

All workplace parking spaces will be registered from October 2011 but only car parks with more than 10 spaces have to pay the levy. The levy of GBP 253 (USD 385) per year will be charged from 2012. The levy will rise to around GBP 350 (USD 532) per year in 2015. Random checks will control if the number of declared parking spaces are not exceeded. In case of violating the parking scheme 50 % of the annual charge per day per breach has to be paid.

See:

- Nottingham City Council (2010) Workplace Parking Levy  
<http://www.nottinghamcity.gov.uk/index.aspx?articleid=905>



### 3.3.2 Road pricing and congestion charging

Basic attributes		Support for sustainable transport	
Administrative level	Local, National	■ Efficiency	+++
Amount	\$\$	■ Equity	+++
What can it fund?	Infrastructure Maintenance Public transport Technology Institutions Policies Traffic management	■ Environment	+++
Examples		Support for financial sustainability	
Singapore – Electronic Road Pricing London – Congestion Charge		■ Stability	++
Main Decision-makers		■ Political acceptability	+
Finance ministry/treasury		■ Administrative ease	+
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Consider road pricing as the first-best solution to implement user-pays principle	
Mayor/city administration	X	■ Consider earmarking revenue to improve transport service quality to increase public acceptability	
Local Transport authority	X		
Enforcement authority	X		
Private sector operators			
Businesses			
International organisations			
NGOs, media and civil society			

Road pricing involves directly charging road users within a defined area for their use of road space. There are many forms of road pricing, including:

- Cordon pricing – where charges are levied for access to limited geographical areas, and charges are often differentiated based on time of day;
- Time-dependent tolling – applied to individual roads or lanes they are implemented to improve traffic flows in targeted areas; and
- Electronic road pricing – which enables more stringent differentiation of charges by road, time of use and type of vehicle over a specified area.

*“The charges levied are flexible and can therefore be varied to best reflect the various negative externalities generated.”*

Charges can subsequently vary based upon geographical area, vehicle type, day, time, and (when using more advanced systems) upon levels of congestion. This flexibility is the major strength of road pricing, and provides scope to best implement the user-pays principle.

*“Congestion charging is also considered to be a relatively equitable mechanism.”*

This is largely owing to the fact that car ownership in developing countries is predominantly by those who earn relatively high-incomes, and who are likely to attach the highest value to reduced travel time and increased reliability. Providing alternatives to driving (e.g. public transport) at the same time as introducing congestion charging would reduce the additional burden to current drivers.



Road pricing is often a politically controversial scheme with relatively low levels of public acceptability. The opinion of the public and of businesses that are directly affected by the charge tends to be highly negative, and this has created political resistance to the widespread implementation of this measure. The World Bank (2002) notes that whilst road pricing schemes in Singapore (further information provided in Box 19) and Seoul have been successful, attempts to introduce road pricing schemes in other cities in developing countries, such as Bangkok, Hong Kong and Kuala Lumpur, have been less effective often due to opposition from the public. On the other hand, the congestion charging scheme in Stockholm is widely accepted by the public and citizens have called for a continuation of the pricing scheme.

***“Political acceptability can be increased by using the extra revenue to ensure the provision of high-quality public transport and non-motorised transport infrastructure.”***

Revenues can be reinvested in wider urban transport modes, such as public transport, to improve options for modal shift. It can also be used to help service capital payments and to maintain the infrastructure, so that benefits of the charge are immediately perceived by the users. The example of London in which the majority of revenues are reinvested into improving bus services is given in Box 20.

**Box 18:**  
**Road pricing in Seoul, South Korea**

Road pricing was introduced in South Korea with the scheme being based upon two tunnels linking central Seoul to the southern part of the city. Traffic flow through both of the tunnels was high, although two years after the road pricing schemes was introduced peak period passenger vehicles volumes decreased by 34 %. An impact of the charge being levied on such a specific area traffic volumes increased on alternative routes by up to 15 %, although numerous efficiency benefits were accrued in an area wider than the two tunnels subject to the charge. Vehicles carrying three or more occupants were exempt from the charge, which was levied at USD 2.20 per vehicle, and the charge was lifted on Sundays and on bank holidays. See

- World Bank (2002) Cities on the move [http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/cities\\_on\\_the\\_move.pdf](http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/cities_on_the_move.pdf)

**Figures 22a, b**  
*Electronic Road Pricing Gantry (left) and on-board system for fare collection (right) in Singapore.*

Photos: Calos Pardo (left), Thirayoot Limanond (right), 2008



### Box 19: Singapore's Electronic Road Pricing scheme

Singapore has been a pioneer in introducing electronic road pricing. The Area Licensing Scheme (ALS) began operating in 1975. Under this scheme, all vehicles had to pay a fee to enter the Central Business District (a restricted zone of 620 hectares) of the city between 7:30 to 9:30 am on weekdays. In 1989, the fee was USD 0.50 per day for motorcycles, USD 3 for company cars and USD 1.50 for private cars.

In September 1998, the Electronic Road Pricing Scheme (ERP) replaced the previous manual system

within the restricted zone. It was later extended to some key arterial roads beyond the city centre. The introduction of the electronic system had major advantages: it saved costs by replacing labour and made it possible to introduce flexible charges which are capable of regulating traffic demand. Charges are adapted to the time of the day and actual congestion levels. The more congested the roads are, the higher the fees charged from road users.

ERP-rates for passenger cars, taxis and light good vehicles from 3 May 2010 – 1 August 2010 (in Singapore-Dollars) (Source: LTA, 2010)

Monday to Friday	7.00am – 7.05am	7.05am – 7.25am	7.25am – 7.30am	7.30am – 7.35am	7.35am – 7.55am	7.55am – 8.00am	8.00am – 8.05am	8.05am – 8.25am
Expressways								
CTE between Ang Mo Kio Ave 1 and Braddell Road	\$1.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.50	...
CTE after Braddell Road, Serangoon Road and Balestier slip Road	\$0.00	\$0.00	\$0.00	\$0.80	\$1.50	\$1.50	\$2.00	...
ECP after Tanjong Rhu Flyover	\$0.00	\$0.00	\$0.00	\$1.50	\$3.00	\$3.00	\$2.50	...
Arterial Roads								
Bendemeer Road southbound after Woodsville Interchange	\$0.00	\$0.00	\$0.00	\$0.50	\$0.50	\$0.50	\$0.50	...
Thomson Road southbound after Toa Payoh Rise	\$0.00	\$0.00	\$0.00	\$0.50	\$0.50	\$0.50	\$1.30	...

See:

- Christansen, G (2006) Road Pricing in Singapore after 30 years  
<http://cato-institute.org/pubs/journal/cj26n1/cj26n1-4.pdf>
- Keong, C (2002) Road pricing Singapore's Experience  
[http://www.imprint-eu.org/public/Papers/IMPRINT3\\_chin.pdf](http://www.imprint-eu.org/public/Papers/IMPRINT3_chin.pdf)
- LTA (no date) Electronic road pricing, the

Singapore way

<http://www.comp.nus.edu.sg/~wongls/icaas-web/links/NLB/innovsymp06/eddie-erp-talk.pdf>

- ST Electronics (no date) Electronic Road Pricing For Singapore  
<http://www.stee.stengg.com/lsg-grp/capabilities/pdf/transport/road/13022006/ERP.pdf>

For more information, see:

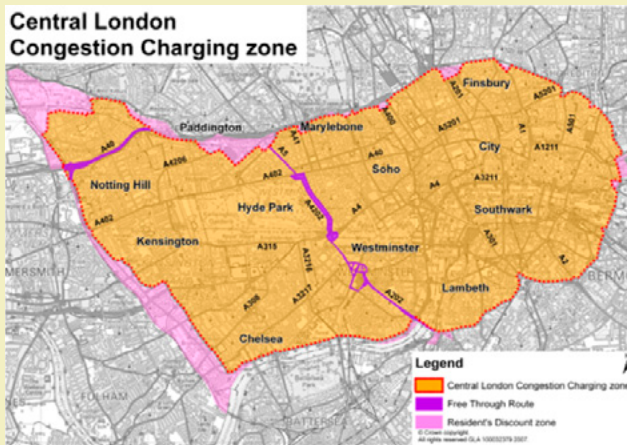
- GTZ Training Document – Transportation Demand Management <http://www.sutp.org>

**Box 20: The London Congestion Charge**

The London Congestion Charge became operational in 2003 (later extended in 2007), and was implemented to reduce congestion within the central city area and where high-quality public transport was already in existence. Drivers must pay GBP 8 (USD 12) per day to enter and travel within the charging zone. Enforced by cameras that monitor vehicular movements, the scheme is estimated to have reduced traffic volumes by 60,000 car movements per day, and fuel consumption

by 20%. It has also increased public transport patronage and non-motorised vehicle use.

The Congestion Charge raised approximately GBP 268 million (USD 406 million) in the financial year 2007/2008 (TfL, 2008). Net revenues have been largely used to improve public transport provision. Implementation and operating costs were high, involving approximately GBP 180 million (USD 273 million) for setup of the scheme. Nearly half the revenues are lost in administrative costs on a yearly basis (see Table 7).



Figures 23a, b  
 Congestion charging zone in central London (Source: TfL, 2010b)  
 and Congestion charging sign on a street in London, UK.

Photo by PTV, 2006

**Table 7: Revenues and costs for the financial year 2007–2008**

	Value (GBP million/USD million)
<b>Total Costs</b>	<b>GBP 131/USD 196</b>
Scheme operation, publicity and enforcement	GBP 91/USD 136
Other: including staff, traffic management and TfL central costs	GBP 40/USD 60
<b>Total revenues</b>	<b>GBP 268/USD 402</b>
Standard daily vehicle charges (GBP 8/USD 12)	GBP 146/USD 219
Fleet vehicle daily charges (GBP 7/USD 10.5)	GBP 37/USD 55
Resident vehicles (GBP 4 per week/USD 6)	GBP 12/USD 18
Enforcement income	GBP 73/USD 110

Source: TfL, 2008

Before the charge was introduced, London's congestion levels were amongst the highest in Europe. It was estimated that the city lost between USD 3–7 million every week due to lost time as a result of congested streets. The charge has led to a traffic volume reduction of 21% (approximately 70,000

fewer cars). All revenues are earmarked for use in transport improvements.

See:

- TfL (2009) About the Congestion Charge <http://www.tfl.gov.uk/roadusers/congestion-charging/6723.aspx>

### 3.3.3 Employer contributions

Basic attributes		Support for sustainable transport	
Administrative level	Local, National	■ Efficiency	++
Amount	\$\$	■ Equity	++
What can it fund?	Infrastructure Maintenance Public transport	■ Environment	++
Examples		Support for financial sustainability	
Brazil – Vale-Transporte France – Versement Transport		■ Stability	+++
Main Decision-makers		■ Political acceptability	++
Finance ministry/treasury	X	■ Administrative ease	++
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Ensure a legislative framework which allows business taxes to be used (earmarked) for urban transport	
Mayor/city administration	X	■ Ensure that the benefits to businesses are communicated effectively to improve political acceptability	
Local Transport authority			
Enforcement authority			
Private sector operators			
Businesses	X		
International organisations			
NGOs, media and civil society			

Employer contributions are given by businesses to support local transport. They are paid directly to the local authority as a tax, or provided as a subsidy to the employees to pay for their transport fares.

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*“Revenue raised from business taxes tends to be locally owned and controlled, and so there is the opportunity for it to be used as best befits local needs and priorities.”*

---

Employer contributions can only be imposed if there is an enabling legislative framework. With an appropriate legislative framework in place, the revenues provide reliable and long-term income.

**Box 21: The Brazilian Vale-Transporte**

In Brazilian cities, employers are required by law to buy and distribute public transport tickets to their employees.

Alternatively, employers can provide transport directly to their staff. They are also allowed to

withhold up to 6% of the basic salary to help defray the cost of purchasing the tickets. (Lima and Faria, no date)

There is anecdotal evidence to suggest however, that these tickets are often sold by the workers for cash, who then walk or find cheaper ways of getting to work.

front side of the card



back side of the card



**Figure 24**  
*Vale-Transporte Card.*  
Source: Fetranspor, 2009

See:

- Lima, M and Faria, S (no date) [http://www.thredbo.itls.usyd.edu.au/downloads/thredbo6\\_papers/Thredbo6-theme3-Lima-Faria.pdf](http://www.thredbo.itls.usyd.edu.au/downloads/thredbo6_papers/Thredbo6-theme3-Lima-Faria.pdf)

**Box 22: Versement Transport in France**

The French Versement Transport (VT) was introduced in 1971 and is a tax levied on employees' salaries to pay for improvements to public transport in the local area. In return for this, employees receive subsidised or free travel on public transport.

Organisations with more than 9 employees in a district with more than 10,000 inhabitants are legally required to pay the VT. The rate currently ranges from 0.55% to 1.72% of the total wages of each eligible company. In Île-de-France, the region of Paris, the maximum rate accounts for 2.2% of total wage. A maximum limit is set by local government. Revenues have been used to part finance small and large-scale urban transport infrastructure projects across France (OSMOSE,

2007). It has played a major part in funding the upgrading and expansion of the Paris Metro, as well as the light rail transit and metro systems seen in many French cities (Enoch, M *et al.*, 2005). The revenue raising potential for this mechanism has been estimated to be approximately GBP 100 million per annum for an urban area the size of Lyon (PTEG, 2004).

See:

- OSMOSE (2007) Urban Transport Plan for the Urban Community of Lille [http://www.osmose-os.org/documents/137/Lille%20\\_PILLOT%20good%20practice\\_.pdf](http://www.osmose-os.org/documents/137/Lille%20_PILLOT%20good%20practice_.pdf)
- PTEG (2004) We must learn from the French on tram schemes. <http://www.pteg.net/MediaCentre/NewsArchive/2004/20040610-1>

### 3.3.4 Fare box revenues

Basic attributes		Support for sustainable transport	
Administrative level	Local, Private	■ Efficiency	++
Amount	\$\$	■ Equity	++
What can it fund?	Public transport	■ Environment	++
Examples		Support for financial sustainability	
Tokyo Metro		■ Stability	++
Main Decision-makers		■ Political acceptability	++
Finance ministry/treasury		■ Administrative ease	+
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Ensure fares are coordinated between modes	
Mayor/city administration	X	■ Set fares carefully to avoid negative impact on patronage	
Local Transport authority	X	■ Recognise its importance within the wider context of public transport regulation	
Enforcement authority			
Private sector operators	X		
Businesses			
International organisations			
NGOs, media and civil society			

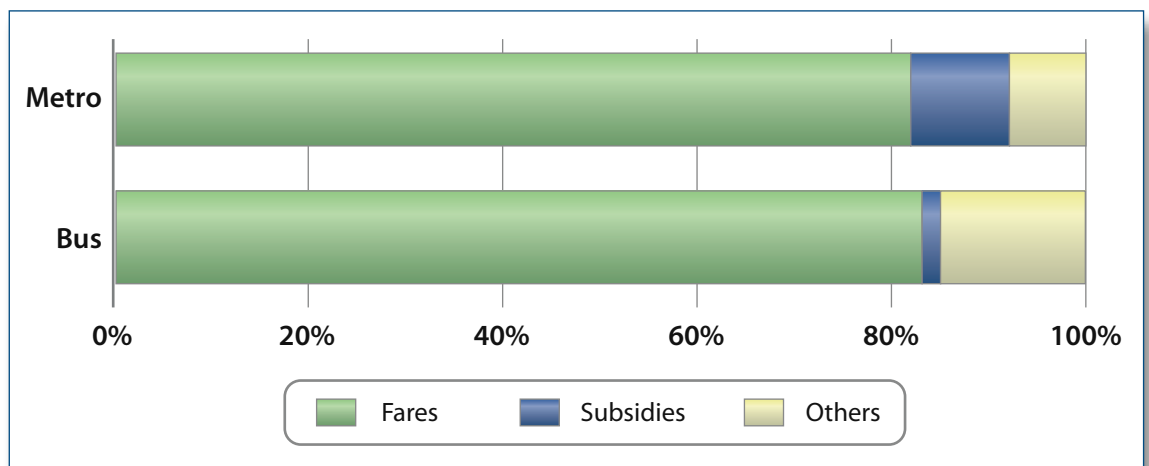
*“Fare box revenues can be a significant source of funding for public transport.”*

London raises approximately GBP 2 billion a year from the fare box, and in some large Asian and Latin American cities fare income is sufficient to fund a large proportion of the costs of public transport (see example from Tokyo below). The continuous income that they provide

constitutes a large and stable revenue base that is typically reinvested in the local transport network, either to cover part of the operational costs<sup>[12]</sup> or to support capital borrowing.

Depending on the legislative framework, local governments have direct access to fare revenues, as well as the ability to set fare revenues as

<sup>[12]</sup> Note that in many cases, fare box revenues are not sufficient on their own to cover operational costs.



**Figure 25**  
*Sources of funding for Tokyo Metropolitan Bus and Metro Services.*

Source: Bureau of Transportation, Tokyo Metropolitan Government, Japan, 2009



deemed necessary. This gives considerable control over levels of income.

Fare levels must be set carefully to avoid the negative impacts upon overall patronage (and resulting revenue loss), as well as the impacts for vulnerable users such as the urban poor who are unlikely to have alternative travel choices.

For further information on transport fares and subsidies see GTZ *Sourcebook* Module 3c: *Bus Regulation and Planning* <http://www.sutp.org>

**Box 23: Indian public transport: low fares fail to cover operational costs**

The lack of financial resources impedes necessary investments in and the maintenance of public transport in many cities around the world.

In India 23 % of the urban population is living in poverty. Public transport fees are kept extremely low which generates increasing financial problems. The extremely low fares sharply restrict revenues from public transport operation. The consequences are a lack of money for even routine maintenance and the replacement of vehicles.

One of the most unprofitable bus systems in India is located in Kolkata. It covers only 42 % of its costs through passenger fares. In contrast Delhi (72 %) and Mumbai (80 %) are more efficient at recovering costs through fares.

See:

- Pucher, J *et al.*, (2004) The crisis of public transport in India: Overwhelming Needs but limited Resources <http://131.247.19.1/jpt/pdf/JPT%207-4%20Pucher.pdf>

**3.3.5 Public transport subsidies**

<b>Basic attributes</b>		<b>Support for sustainable transport</b>	
Administrative level	Local, National	■ Efficiency	+
Amount	\$	■ Equity	++
What can it fund?	Public transport	■ Environment	+
<b>Examples</b>		<b>Support for financial sustainability</b>	
High subsidies – Lahore, Moscow		■ Stability	+
Low subsidies – London, Lagos		■ Political acceptability	+++
No subsidies – Hong Kong, many Latin American cities		■ Administrative ease	+
<b>Main Decision-makers</b>		<b>Main considerations for policy makers</b>	
Finance ministry/treasury	X	■ Ensure subsidies are provided on a financially sustainable basis	
Transport ministry	X	■ Seek to minimise the adverse effects of subsidies, learning from international best practice (see Section 3.6)	
Environment ministry			
Mayor/city administration	X		
Local Transport authority	X		
Enforcement authority			
Private sector operators	X		
Businesses			
International organisations			
NGOs, media and civil society			

Until the 1960s, most public transport systems in cities worldwide faced less competition from the private automobile. However, extensive investments in road infrastructure (and in some cases the active abolition of railways and tram-lines) led to a rise in individual private transport. As a result public transport usage dropped and public transport services now struggle to break even. Currently, self-supporting public transport systems are generally limited to cities with very high densities and low car ownership, such as Hong Kong and Singapore.

To reverse this trend, and to promote sustainable travel behaviour, public transport fares may in many cases need to be subsidised (and supplemented by other continuous revenue streams) (Enoch, M *et al.*, 2005; World Bank, 2002). However, public transport subsidies must be coupled with measures and regulation to ensure that they are used effectively and not wasted.

This is owing to the potential for subsidies to be misused or poorly managed. A preferable alternative to subsidising services is to capitalise upon different user preferences by supplying different products to different segments of the market (World Bank, 2002). ‘Premium’ public transport services (*i.e.* express or air conditioned services) could, for example, be provided at premium prices instead of using subsidies.

Subsidies can also be reduced through increasing the role of the private sector, which often increases the efficiency of operation. These processes can be used to introduce competition and lead to the lowering of fares without the need for subsidy. However, measures such as performance based contracts must be in place to mitigate the disadvantages of private sector involvement (See Section 3.3.7 on Public Private Partnerships for further information).

#### Box 24: When are subsidies justified?

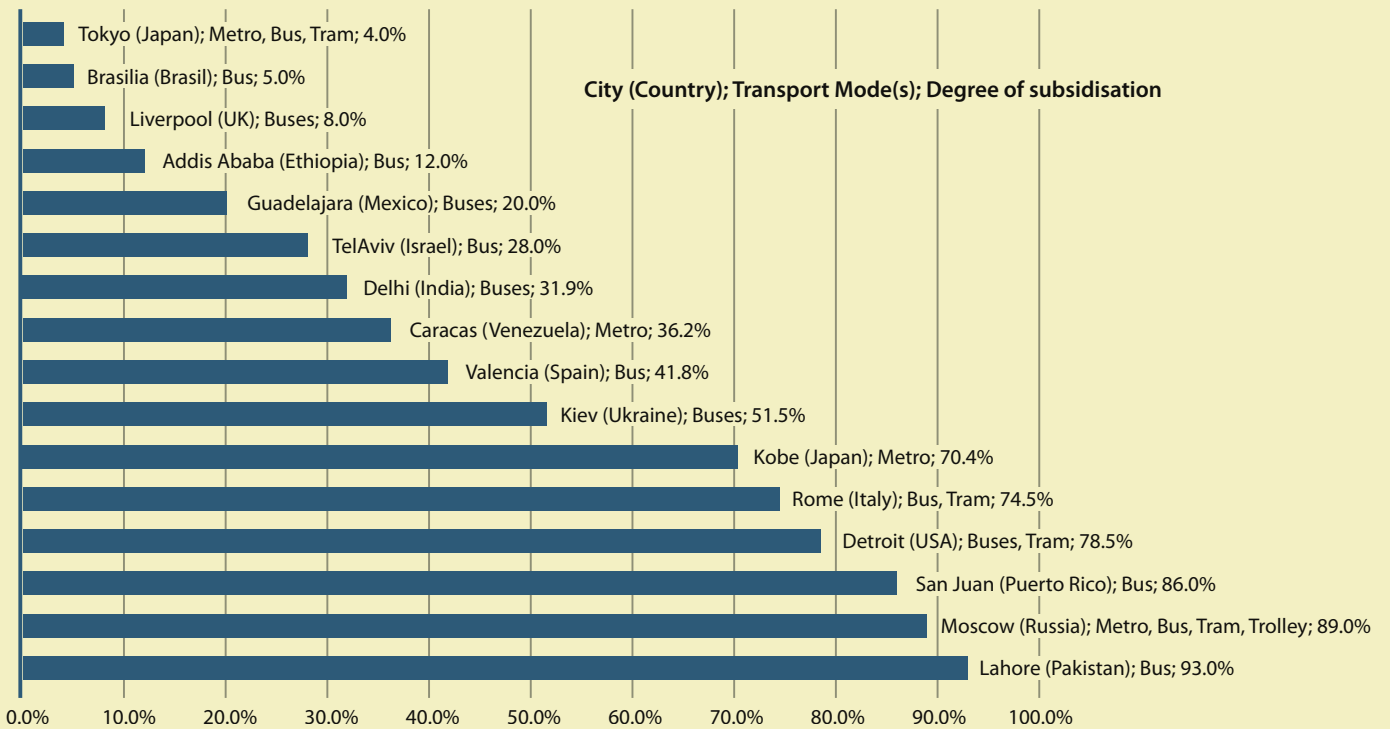
Urban public transport systems often require subsidies to become financially viable, especially with regards to covering the large initial capital investments associated with public transport infrastructure. Although this seemingly violates the user pays principle, such subsidies are justified when:

- ✓ Car users do not pay their full costs (including the pollution, congestion and accidents they cause) in which case the balance between the modes can be partially readdressed via public transport subsidies.
- ✓ Encouraging more use of public transport allows all users to benefit, as operators improve their services (e.g. increasing frequency of service).
- ✓ Private involvement in operations through public tendering has been fully exploited, runs under competitive terms but still cannot break even.

Furthermore, some believe that transport is a “public good” like education or health care. If the price for public transport is left to the market, only the better off (who can also normally afford cars) will use it. Subsidies can be seen as a contribution to the whole society to provide equal preconditions for mobility needs. See:

- Public Transport Users Association (2009) <http://www.ptua.org.au/myths/subsidy.shtml>

**Box 25: A comparison of public transport subsidies across the world**



**Figure 26**  
*Subsidies of Operating Costs for Public Transport.*

Source: Jane's Information Group, 2004

The graph above shows that operating costs for public transport are heavily subsidized in many cities. However, it is not possible to make a general statement as to whether the level of subsidization of urban transport is greater or less in either developing or developed countries. The level of subsidization strongly depends on the economic, political and social situation in a city.

To guarantee mobility for all income groups, developed countries contribute a very high percentage of the operation costs of public transport from public spending. In European cities, the operation of public transport is subsidized at an average of

50%. However, subsidization levels can be higher, for example in Detroit where subsidization of the bus and tram system is 78.5%. The same can be said to be true in a number of cities in developing countries. San Juan, for example, subsidizes its bus services by 86% and Lahore by 93%.

Some cities in both developing and developed countries have adopted a "zero-subsidy policy". Survey data show that many developed cities like London, Glasgow, and Copenhagen do not use public spending but the same is true for many developing cities, such as Dar es Salaam, Pune or Lagos. The main advantage of this approach is the fact that public savings

can be used to foster economic growth or for investments in high quality public transport systems. In contrast, however, "high-subsidy policies" contribute to lower fares and make public transport affordable for a wider range of citizens.

In general, local governments should take steps to improve the financial performance of public transport systems through a combination of pricing private transport correctly (see Box 8) and securing efficient operations through e.g. performance based contracts (see Section 3.3.7).

See:

➤ Jane's Information Group (2004)

### 3.3.6 Land development/land value taxes

Basic attributes		Support for sustainable transport	
Administrative level	Local, Private	■ Efficiency	++
Amount	\$\$\$	■ Equity	++
What can it fund?	Infrastructure Public transport	■ Environment	++
Examples		Support for financial sustainability	
Copenhagen (Metro) London (Jubilee Line extension)		■ Stability	++
Main Decision-makers		■ Political acceptability	++
Finance ministry/treasury	X	■ Administrative ease	+
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Create a legal framework that allows land-based taxes to be collected for transport use	
Mayor/city administration	X	■ Ensure a consistent and transparent communication process to minimise perception of unfairness from those being taxed	
Local Transport authority	X		
Enforcement authority			
Private sector operators			
Businesses	X		
International organisations			
NGOs, media and civil society			

There are a range of different land-related fiscal measures that can be used to help finance primarily urban transport infrastructure, but also urban transport services.

*“The general idea is that the additional “service” provided by new transport infrastructure should be paid for by those who benefit from it directly, i.e. the owner of the land/properties surrounding the transport development.”*

These can typically be classified under one of the following two mechanisms:

- Capture of value enhancement through taxes and charges (commonly referred to as land value tax); or
- A partnership agreement between developers or property owners and the state (commonly referred to as developer contributions).

#### Box 26: Making best use of the value of land

Land is a vital and expensive resource needed for urban roads, public transport corridors, footpaths and cycle lanes. The ownership of land by the local authority is therefore a key factor for an effective transport strategy. German cities possess between 25 % and 45 % of all land in its boundaries, which can be sold or exchanged for other plots of land (Metschies, 2005).

In Mumbai India, the Metropolitan Regional development Authority auctioned roughly 13 acres of land it possessed at around USD 1.2 billion. This amounted to 3.5 times the total value of municipal bonds that have been issued in all of India over the past 12 years. The proceeds were targeted primarily towards transport infrastructure investment.

See:

- Peterson, G (2008) Unlocking Land Values to Finance Urban Infrastructure <http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/publication/Gridlines-40-Unlocking%20Land%20Values%20-%20GPeterson.pdf>

Both of these mechanisms are explained in the following.

**Land value tax** is a means of raising revenues from all land uses in a specified area by charging each land owner in relation to the benefit that they will receive from increases in the land value that result from enhanced transport provision in the vicinity, reflecting the potential for businesses to receive more customers, reduced transport costs and enhanced efficiency through accessibility improvements.

Land value tax collection involves periodic valuation of all property within a city. The basis for taxation is the optimum permitted use, not the current state of the site; all existing improvements are therefore ignored. This means, for example, that an empty site in a town centre with planning permission for an office block would pay the tax at the same rate as an identical adjacent site which already has a similar size office block developed. Periodic revaluations have to ensure that any rises or falls in land prices (for example due to changes or relative changes in transport infrastructure) would be reflected in the taxable value.

Each land owner is then charged a tax, calculated as a certain percentage of the current market price. Currently, tax rates differ widely in those cities or countries that already use land value taxation. As the land value rises, so does the tax collected. Such a tax is cheap to collect and impossible to avoid (one cannot relocate land to a place where no tax is imposed), and it would have an immediate incentive for landowners to bring their land into better use. Unlike taxes on buildings, there is no reduction for dilapidation or for keeping a site empty. Similarly, there is no increased tax liability for improving a building.

The tax should be levied in a way that does not cause holders of land to sell in a way that leads to market collapse. This would be counter-productive for any attempt to raise revenue for social improvements. A gradual introduction of land value tax can help to ensure that this does not occur.

**Developer contributions** are directly related to the development of land, and tend to take the form of legally binding commitments made by

### Box 27: Positive effects of land value taxation

Funding new and improved transport infrastructure from land value gains creates a positive economic cycle that provides a win-win situation for all concerned, including the landowners who provide the financial base. The following highlight a number of potential benefits:

- Government can provide new transport improvements
- Taxpayers are not penalized
- Taxes on trade are not increased (in general trade taxes are more economically destructive than taxes on land)
- Public transport users benefit from shorter travelling times and more convenient journeys
- It captures excess profits made from the monopoly on desirable sites
- Businesses near new stations can increase their trade and profits

See:

- Wetzel, D (2006) Innovative ways of financing transport <http://www.etcproceedings.org/paper/download/3238>

### Box 28: The London Jubilee Line Underground line extension

The example of the London Jubilee Underground line extension illustrates the impact that transport infrastructure can have upon land values. Riley (2002, cited in Wetzel, 2005) estimated that the land value within a 1,000 yard radius of the extension increased by USD 18.8 billion. This compares to a construction cost of USD 5 billion, which shows that had land value tax been applied, the cost of the scheme would have been covered. A study commissioned by Transport for London (TfL) into the uplift value was effective in highlighting the uncertainty that surrounds the value of the uplift. Complexities include:

- Judging and applying value to plots before the line was extended;
- Defining the area of influence of the transport improvement;
- Estimating the value attributable to the transport improvement;
- Determining the time period in which the land value increased; and
- Separating the impact of the Jubilee Line from other developments and the normal property cycle.

See:

- Wetzel, D (2006) Innovative ways of financing public transport <http://www.etcproceedings.org/paper/download/3238>



### Box 29: Infrastructure contribution charges in Germany

In Germany, communities can charge private land owners for the investment in roads constructed to provide access to new development areas. The levy can cover the purchase of real estate and the building costs for roads, walkways, bicycle lanes, illumination,

and drainage systems. Costs for bridges, ramps, subways or additional costs for building a main road are not covered.

The community has the right to charge the owners of the developed real estate (on a one-off basis) up to 90 % of the aforementioned costs. The cost sharing between municipality and private owners for the state of North Rhine Westphalia is given in the Table 8.

**Table 8:**  
Cost sharing between municipality and land owners in urban road financing in Germany

	Municipal road owner	Private land owner
<b>A. New urban roads:</b> All roads of a new development area including sidewalks, etc. (based on existing development statute acc. to Federal Building Law)	10 % of construction costs	90 % of construction costs
Subsequent maintenance of roads within new development area	100 %	0 % (Indirect contribution through land tax)
<b>B. Existing urban roads</b> (Contribution Statute according to Provincial Law)		
<b>1. Maintenance of all roads</b>		
1.1 Winter service of all urban roads	100 % for road lanes	100 % for sidewalks
1.2 Repair to initial standard	100 %	0 %
1.3 New sidewalks and street lighting for existing roads	100 %	0 %
<b>2. Rehabilitation/Upgrading</b>		
2.1 National and provincial roads	100 % by federal or provincial government	0 %
2.2 Urban main traffic roads including lighting and drains	90 %	10 % for traffic lanes (up to 8.50 m width) 50 % for sidewalks and parking lanes
2.3 Main residential development road (artery) incl. lighting and drains	70 %	30 % for traffic lanes (up to 6.50 m width) 50 % for sidewalks and parking lanes
2.4 Main industrial development roads	70 %	30 % for traffic lanes (up to 6.50 m width) 100 % for sidewalks and parking lanes
2.5 Main shopping streets	60 %	40 % for traffic lanes (up to 6.50 m width) 60 % for sidewalks and parking lanes
2.6 Residential roads	50 %	50 % for traffic lanes (up to 5.50 m width) 50 % for sidewalks and parking lanes
2.7 Traffic calming zones incl. parking and lighting	50 %	50 % for traffic lanes (up to 9.00 m width) 50 % for sidewalks and parking lanes
2.8 Commercial roads for industry	50 %	50 % for traffic lanes (up to 8.50 m width) 50 % for sidewalks and parking lanes
2.9 Sidewalks and parking lanes (independent or in combination with residential roads or shopping lanes)	40 %	60 %

Source: Federal Building Law (BauGB)/Communal concession tax law (KAG)  
Adapted from Fink, M (2005)

the landowner in conjunction with the granting of planning permission. They require developers to secure provision of, or improvement to, existing transport infrastructure to meet the needs of new development. Unlike some other forms of taxation they are impossible to avoid.

The value of developer contributions can be relatively accurately determined, as finance tends to be provided around the time of development (the revenue raised from developer contributions does, however, tend to bear little relation to the potential increase in value). Land value taxation payments can be slightly more controversial however, as there is currently no standard way of assessing increases in land value. The areas where land value tax is most viable may also not be where the transport investment is most needed, which could create, or exacerbate, regional inequalities. Concern over inequality is also related to developer contributions, as their

nature means that the payments tend to be confined to growth areas.

The process of obtaining developer contributions can be relatively slow, and can lead to delays in the planning system. It can also be a complex process, which involves a wide range of stakeholders.

The fact that developer contributions are individually negotiated does, however, enhance flexibility, which enables local government to negotiate the most beneficial package. Payments can, for example, be in-kind, financial, one-off, phased, maintenance related or continuous over an agreed period.

The existence of these complexities does not change the fact that there is the potential for large revenues to be legitimately received from the many private sector organisations that benefit from the large public sector investments.

**Box 30: Land value capturing in Copenhagen, Denmark**

In 1994 construction of the metro system started in Copenhagen, with the first part completed in 2002. The national Government handed over its share of a 600 meter wide and 5 km long stretch of undeveloped land to the City of Copenhagen to finance the construction. This area called “Orestad” is located close to the city center but was nearly

inaccessible for public use. After constructing the metro land value increased significantly. Due to the property rights the city was able to sell the real estate at a much higher price than before. Revenues from the sale of real estate contributed to around 45 % to the construction costs. The rest of the costs for the Metro system is being paid back by fares (33 %), real estate tax (16 %) and other revenues (6 %).



**Figure 27**  
*New metro in development area, Copenhagen, Denmark.*  
Photo by Axel Kuehn, 2004

See:

- OECD (2007) Infrastructure to 2030 (Volume 2): Mapping Policy for Electricity, Water and Transport  
[http://www.oecd.org/document/49/0,3343,en\\_2649\\_36240452\\_38429809\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/49/0,3343,en_2649_36240452_38429809_1_1_1_1,00.html)
- Economopoulos, V (2008) The Financing of Public Transport  
<http://www.docstoc.com/docs/24355845/MINISTRY-OF-TRANSPORT-%E2%80%93-MINISTRY-OF-INFRASTRUCTURE-WORLD>

**Box 31:**  
**Private railway companies in Japan**

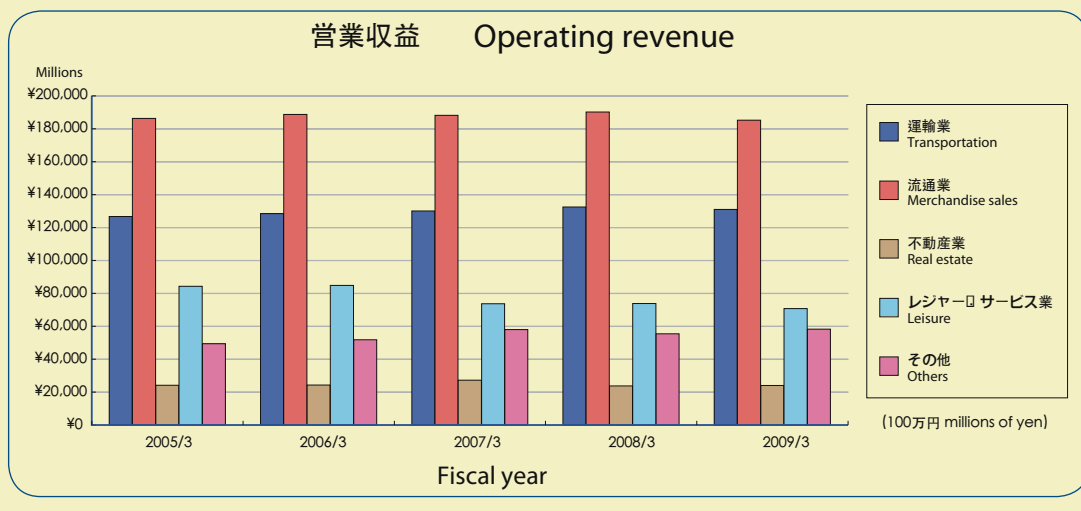
In Japan, private train companies in metropolitan areas own and manage a large part of the property surrounding the railway lines. Large department stores, shopping malls and hotels are constructed around major stations, and receive customers who travel from residential districts located around the same railway line. Revenues from such ancillary services amount to a significant proportion of a

railway company's income, as shown in Figure 28. The Japanese example shows perhaps an extreme example of how the value of land surrounding transport infrastructure can be captured, and used to finance transport. Similar examples can also be found in Hong Kong.

See:

- Keio Corporation (2010) Fact Book 2009 <http://www.keio.co.jp/english/pdf/factbook2009.pdf>

**Figure 28**  
*Operating revenues of Keio Corporation, a large private train company in Tokyo, Japan.*  
Source: Keio Corporation, 2010



**3.3.7 Public Private Partnerships**

Basic attributes		Support for sustainable transport	
Administrative level	Private	■ Efficiency	++
Amount	\$\$	■ Equity	+
What can it fund?	Infrastructure Maintenance Public transport Technology	■ Environment	+
Examples		Support for financial sustainability	
Build-Operate-Transfer of transport infrastructure (across Asia) Bogotá – Franchising of bus services		■ Stability	++
Main Decision-makers		■ Political acceptability	++
Finance ministry/treasury	X	■ Administrative ease	+
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Fully understand the benefits and risks of engaging the private sector	
Mayor/city administration	X	■ Ensure that franchising and bidding processes are robust and that their outcomes support the public objective.	
Local Transport authority	X		
Enforcement authority			
Private sector operators	X		
Businesses	X		
International organisations			
NGOs, media and civil society			

In addition to land-based taxation, financial resources from the private sector could be leveraged through Public Private Partnerships (PPP).

A PPP is a contractual agreement between a public sector agency and a private sector party to secure funding for construction, modernisation, operation and maintenance of an (infrastructure) project and delivery of a service that traditionally was provided by the public sector. It involves the sharing of risks and rewards and is a method of procurement. It leads to a greater involvement of the private sector in the design, building, finance and/or operations and maintenance of public facilities and services. They can be used to finance either the construction of transport infrastructure and/or the operation of transport services.

Indeed public-private partnerships are often regarded as an effective way for local authorities to finance transport infrastructure. This is largely owing to the fact that they combine the security and political commitment of the

government with the expertise and financing of the private sector. The private sector is also regarded as being more efficient at undertaking large-scale capital projects, and as having the expertise to more effectively manage the major risks involved in the design, building, financing and operation of the asset. (Box 32)

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*“Public-private partnerships are often arranged so that the private sector owns the transport infrastructure which it has financed, and the public sector pays for the use of the asset and associated services.”*

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This approach enables the private sector to recover the investment that it has made over the contract period. This type of partnership is often considered to be better value for money for the public sector than buying the asset and being responsible for running and maintaining

### Box 32: What are the merits and demerits of PPP?

#### Arguments for PPP are plentiful

Advocates of PPP claim that private finance can fill a gap in public resources and ensure that needed transport infrastructure and services are delivered.

PPP can also lead to improvements in the quality of public services. Performance-related penalties that are now built into most PPP contracts are often designed to ensure a continuing improvement in standards.

There are a number of other advantages of PPP including the following:

- Facilitates the utilisation of private sector know-how, expertise and human resources
- The private sector takes the life cycle cost risk but can secure economies of scale over the longer term
- Risks are allocated to the party best able to manage each particular risk
- Budgetary predictability is enhanced
- The public sector can focus on outputs and benefits from the start of a project

#### The drawbacks of PPP must be carefully managed

On the other hand, much criticism has been levied at PPP with many arguing that taxpayers will end up footing the bill. Unless the contract is very clear in its specifications and monitoring of performance is in place, the private contractor could cut corners in order to maximise profits.

Furthermore, contracts may need to be renegotiated with private companies if they fail to deliver projects within budget, for example if construction costs escalate unexpectedly. In the worst instance, the private contractor may go bankrupt, passing the whole risk back to the public sector since it effectively underwrites the investment.

Depending upon the nature of the contract, the costs of funding a PPP scheme will rise over a long period stretching into the future. However there is no guarantee that in the future the government will have the necessary funds to maintain its agreed commitments. These risks should be fully understood and managed, before pursuing PPPs as a financing instrument.

See:

- Jick, E (2007) PT funding and financing [http://chinaurbantransport.com/english/ppt/huichang\\_4/Sung%20Jick%20Eum.pdf](http://chinaurbantransport.com/english/ppt/huichang_4/Sung%20Jick%20Eum.pdf)

it. This owes in part to the fact that the public sector does not bear any of the costs involved, and nor is it required to cover additional costs generated. There are numerous types of partnership, however, which can vary from short-term management contracts to complex partnerships. A number of the most common partnership models are detailed below.

Infrastructure projects tend to be financed via **Design and Build** partnerships, whereby a construction project is put to tender and a private contractor is selected via a competitive bidding process. The infrastructure is then planned and constructed based on a fixed fee, as agreed in the bid, with the contractor taking on the risk involved in the design and construction phases.

There are also a number of ways in which services can be operated, or assets maintained, via a partnership with the private sector. The main differences between such partnerships are largely contractual. One arrangement involves operators retaining revenue collected from service users and making a previously agreed payment to the contracting authority. An alternative arrangement would see the operator and contracting authority sharing revenues generated from service users. In both instances the government maintains responsibility for the investment, although the operational risks are transferred to the operator.

Partnerships can also be formed in which the private sector both builds and operates infrastructure. A commonly used contractual arrangement is **Build-Operate-Transfer (BOT)** whereby the contractor invests in, and operates, infrastructure and associated services for a fixed period of time, after which ownership reverts back to the public sector. This has the impact of transferring risks to the private sector whilst retaining ultimate ownership, meaning that the public sector can stipulate basic requirements. This is unlike franchise arrangements, in which the private sector can specify the levels of service provision. Franchises are often used to provide urban rail and bus services.

Other commonly used forms of partnerships that combine the construction of urban transport infrastructure and services include **Build-Own-Operate (BOO)** or

**Design-Build-Finance-Operate (DPFO)**, where the private sector builds, owns and operates a facility, which it sells to its users. Another version is the Private Finance Initiative (PFI) model, the key difference being that the public sector purchases the services from the private sector through a long-term agreement.

Under a BOO contract the financing arrangement are such that a developer (1) designs and builds a complete project or facility (such as an airport, power plant, seaport) at little or no cost to the government or a joint venture partner, (2) owns and operates the facility as a business for a specified period (usually 10 to 30 years) after which (3) it transfers to the government or partner at a previously agreed-upon or market-price. BOO contracts allow public sector customers to focus on their core business while the contractor takes responsibility for the design and operation of the infrastructure. BOO contracts include guarantees on quantity, quality and cost. A revenue stream is a pre-requisite for such contracts. Often a public sector regulator will be set up to monitor performance, including pricing, to ensure that the monopoly position is not abused.

DBFO contracts aim to transfer the risk associated with major infrastructure projects to the private sector while promoting innovation both in technical matters but also in financial and commercial arrangements. By fostering the involvement of the private sector in activities once the monopoly of the public sector, DBFO contracts aim to minimise the financial contribution from taxpayers and achieve value for money. Infrastructure must be handed back to the public sector in a fit condition for service that will not require major capital maintenance immediately following the end of the contract, *i.e.* a required residual life is usually specified and detailed inspections undertaken prior to handover.

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***“Public private partnerships can also be used for the operation of public transport services.”***

---

As a rule of thumb, bus operations should ideally be done by private firms, in a well-regulated



market, under competitive terms. Surveys underline that in general private bus operations are considerably more efficient than public operators (e.g. in Frankfurt Germany, costs fell over 25 % after having tendered its entire bus operations). The PPP should involve the bus operator agreeing to increase service standards,

e.g. investing in new buses, enhancing frequency levels and undertaking driver training. The local authority, on the other hand, should agree to invest in bus priority measures, e.g. dedicated bus lanes or real-time information systems, and perhaps to restrict car access to areas where bus services are provided.

**Box 33: Further information on PPP**

Further information can be found in other GTZ Sourcebook modules including:

- 1c: Private Sector Participation in Urban Transport Infrastructure Provision
- 3c: Bus Regulation and Planning

Both of these are available at: <http://www.sutp.org>

The World Bank and the PPIAF also maintains several interactive toolkits to assist policy makers in low and middle income countries in implementing procedures to promote private sector participation and financing in the transport sector. These are available at:

- World Bank and PPIAF (2009b) Toolkit for Public-Private Partnerships in Roads & Highways  
<http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/index.html>
- World Bank and PPIAF (2007a) Port Reform Toolkit: Effective Support for Policymakers and Practitioners (2<sup>nd</sup> edition)  
<http://www.ppiaf.org/documents/toolkits/Portoolkit/toolkit.html>
- World Bank and PPIAF (2007b) Urban Bus Toolkit <http://www.ppiaf.org/UrbanBusToolkit>

**Box 34: Performance based road maintenance contracts**

Metschies (2005) asserts that almost one third of all roads in developing countries are in poor condition. A relatively common way to improve the condition of roads whilst reducing maintenance costs has been to introduce performance based contracts. In Latin America, for example, the performance is based upon criteria of established standards and takes into consideration features such as potholes, cracks, rutting, friction, drainage

systems, overall appearance and deflection.

Similar schemes have been introduced in a number of developing countries, although in some cases these contracts include partial initial concentrated efforts on the road to enhance their condition. In the case of Uruguay, this was referred to as ‘initial spot rehabilitation’, and improvements were paid for on a unit price basis. The positive impact of the scheme upon road condition is such that in Uruguay, five years after the initial inception of the scheme 50 % of the national roads were maintained through performance contracts.



Figures 29a, b

*Road Maintenance performed by a small scale enterprise in Guatemala.*

Photos: Gunter Zietlow

**Box 35: Examples of PPPs in Public Transport Worldwide**

City (country), project	Description
<p>Bangkok (Thailand) – <b>BTS Skytrain</b></p>  <p>Photo by Manfred Breithaupt, 2005</p>	<p>The plan for the Bangkok mass transit system, part of the master plan from 1995, involves the construction of five lines that will radiate out and join the Bangkok Metropolitan Area to reduce traffic congestion and the associated air pollution. The first two lines (Dark Green Line – 17 km &amp; Light Green line – 6.5 km) have been built using the BOT model (Built-Operate-Transfer). It is operated by Bangkok Mass Transit System Public Company Limited (BTSC) under a concession granted by the Bangkok Metropolitan Administration (BMA). The investor founded BTSC as a special purpose company to finance the system.</p>
<p>Astana (Kazakhstan) – <b>Light Rail Transit System</b></p>  <p>Image courtesy of by Vision Transportation Group</p>	<p>The Municipality of Astana is preparing proposals for the concession for a light rail transit (LRT) system construction and maintenance. The Investment of this Public Private Partnership Project is according to the master developer VTG (Vision Transportation Group) about USD 1.1 billion. The construction of the project is expected to include 26 km of elevated LRT and 19 elevated stations.</p>
<p>Jerusalem (Israel) – <b>Jerusalem Light Train</b></p>  <p>Photo courtesy of Wikipedia.org</p>	<p>The Red Line of the LRT (Light Rail Transit) System and the Blue Public Transport Lane together provides a backbone for the new public transport system in the city of Jerusalem. For this project a 30 year concession agreement was signed with the concessionaire. Three years of this were earmarked for construction and 27 years for operation. An investment grant of NIS 1.4 billion (USD 378.5 million) will be paid according to a set of agreed completed milestones. The JPTA (Jerusalem Public Transportation Authority) will be the Supervising Authority – a governing body including representatives from the Ministries of Finance and Transportation, and the Jerusalem Municipality. The expected date for project completion is the end of April 2011.</p>

See:

**Bangkok BTS Skytrain**

- JICA (2008) Ex-Post Evaluation  
[http://www.jica.go.jp/english/operations/evaluation/oda\\_loan/post/2008/pdf/e\\_project09\\_full.pdf](http://www.jica.go.jp/english/operations/evaluation/oda_loan/post/2008/pdf/e_project09_full.pdf)
- The Nation (2009) Skytrain green lines ready by 2012: BMA  
[http://www.nationmultimedia.com/2009/02/25/national/national\\_30096546.php](http://www.nationmultimedia.com/2009/02/25/national/national_30096546.php)

**Astana Light Rail Transit**

- VTG (no date) New Transportation System of Astana  
[http://visiontransportationgroup.com/en/VTG\\_Astana\\_NTSA.html](http://visiontransportationgroup.com/en/VTG_Astana_NTSA.html)

**Jerusalem Light Train**

- Israel Ministry Of Finance (2009) Jerusalem Light Train  
<http://ppp.mof.gov.il/Mof/PPP/MofPPPTopNavEnglish/MofPPPProjectsEnglish/PPPProjectsListEng/TashtiotTaburaEng/RRakevetJerusalem/>

### 3.3.8 Advertising

Basic attributes		Support for sustainable transport	
Administrative level	Local, Private	■ Efficiency	+
Amount	\$	■ Equity	+
What can it fund?	Maintenance Public transport	■ Environment	+
Examples		Support for financial sustainability	
<ul style="list-style-type: none"> <li>■ London – advertising on bus shelters</li> <li>■ Paris – Vélib public bicycles</li> <li>■ Japan – TV advertising in trains and on rail platforms</li> </ul>		■ Stability	+++
Main Decision-makers		■ Political acceptability	+++
Finance ministry/treasury		■ Administrative ease	++
Transport ministry		Main considerations for policy makers	
Environment ministry		<ul style="list-style-type: none"> <li>■ Consider the opportunity of using advertisement as a way to fund gaps in funding</li> <li>■ Ensure that other objectives such as safety and visual obtrusion are not severely impacted.</li> </ul>	
Mayor/city administration			
Local Transport authority	X		
Enforcement authority			
Private sector operators	X		
Businesses	X		
International organisations			
NGOs, media and civil society	X		



Figures 30a, b  
Advertising on bus stop in London, UK.  
Photos by Geraldine Holland, 2010



Figure 31

*Bus shelter used for advertising in Amman, Jordan.*

Photo by Andrea Broaddus, 2007



*“Revenue generated from advertising on infrastructure or vehicles owned by local government can be an effective way of generating a reliable source of revenue.”*

It can be used to help bridge shortfalls in financing, particularly revenue as contractual arrangements can be put in place that transfer responsibility for maintaining the infrastructure that the advertisements are placed upon.

This is a popular approach in the UK where advertising contracts are typically outsourced to reduce the financial burden on the local authority. In 2005, Transport for London (TfL) – the transport authority responsible for London – negotiated a ten year contract with the outdoor advertising specialist, Clear Channel, for advertising on bus shelters in London.

The agreement involved giving Clear Channel the rights to sell media space on half of TfL’s bus shelter portfolio in exchange for the routine maintenance and design of the street furniture advertised upon. TfL expect that the contract will result in a triplication of the annual revenue that TfL received prior to this from advertising. All of the income generated will be used to enhance London’s transport network (TfL, 2005).

Advertising revenues are also used to fund urban transport in developing countries. In Surat, India, the city hypothecates advertising fees along with vehicle taxes and parking charges for the finance of a dedicated urban transport fund. This is used to finance a range of urban transport projects, including the expansion of bus services and the modifications of three-wheelers to enable them to be powered by Clean Natural Gas (CNG) (Centre for Science and Environment, 2009).

**Box 36: Vélib rental bike scheme in France: financed by advertising**

On 15 July 2007, the city of Paris introduced a new self-service “bicycle transit system” called Vélib. The new self-service bike scheme allows a person to pick up a bike at any station (automated and self-service) in the city and drop it off at any other. There is variable pricing scheme ranging from a one-year subscription or a short-term subscription for daily or weekly usage (EUR 1 for the day, EUR 5 for 7 days and EUR 29 for a year). To help guarantee the return of the bikes short-term users, in addition to paying the subscription fee, have to pay a security deposit of EUR 150. The first 30 minutes of use is free, making the system a functional means of transportation, as this is the average length of time that it takes a Parisian commuter to get from their place of residence to work. In the first two months of operation, 92 % of the trips lasted less than 30 minutes.

The City of Paris wasn’t able to finance a system as large as Vélib alone. The city therefore partnered with JC Decaux, an outdoor advertising and street furniture multinational. The public-private alliance assured the essential imposition of the initiative on the city.

In 2007, there were 20,700 bikes and 1,451 stations. It is estimated that there is a potential of up to 50,000 bikes with 26 million bike rentals and nearly 200,000 subscribers per year.

At large the urban and transportation improvements and traffic restraint measures have led to a decrease in private vehicle traffic by 20 % between 2001 and 2006. Over the same period, air quality has strongly improved.

See:

- Charles, N (2009) The Vélib: a bike sharing program in Paris. An option for New York City? <http://www.newyorkinfrench.net/profiles/blogs/the-velib-a-bike-sharing>



**Figure 32**  
*Vélib bike station in Paris, France.*

Photo by Matthias Gauger, GTZ, 2009



### 3.4 Financing instruments at national level

#### 3.4.1 Fuel taxes/surcharges

Basic attributes		Support for sustainable transport	
Administrative level	National	■ Efficiency	+++
Amount	\$\$\$	■ Equity	+++
What can it fund?	Infrastructure Maintenance Public transport Institutions Policies Traffic management	■ Environment	+++
Examples		Support for financial sustainability	
<ul style="list-style-type: none"> <li>■ Fuel surcharge in Bogotá and other Colombian cities</li> <li>■ Road funds in Africa</li> </ul>		■ Stability	+++
Main Decision-makers		■ Political acceptability	+
Finance ministry/treasury	X	■ Administrative ease	+++
Transport ministry	X	Main considerations for policy makers	
Environment ministry		<ul style="list-style-type: none"> <li>■ Consider fuel tax as a stable source of income and as a proxy for road pricing and environmental taxation</li> <li>■ Liaise with central ministries to seek ways in which revenue can be reallocated to local level.</li> </ul>	
Mayor/city administration	X		
Local Transport authority			
Enforcement authority	X		
Private sector operators			
Businesses			
International organisations			
NGOs, media and civil society			

Fuel taxes are a popular mechanism to raise revenue, either for the general account or for transport-specific usage. It is a relatively simple and reliable way of charging, and their implementation and enforcement are both less problematic than alternative revenue raising approaches. Furthermore, fuel taxes generate a significant portion of tax revenue, particularly in developing countries, and revenues can be earmarked for specific purposes if required.

*“On a global level between 80 to 90 % of all revenues derived from the transport sector are known to be raised from fuel taxes.”*

#### Box 37: The Environmental Trust Fund in Mexico

The Environmental Trust Fund was established in Mexico in 1992 with the aim of financing environmental transport-related projects. Funded by additional revenues generated by an increase in fuel tax of one US cent per litre, the levy raised revenues of approximately USD 70 million between 1992 and 1998, which were used to finance a range of projects including public awareness campaigns and vapour recovery systems in refuelling stations.

See:

- GTZ Sourcebook Module 1d: *Economic Instruments*  
<http://www.sutp.org>

Fuel taxes can be used as a stable source of revenue for the maintenance of, and in some cases such as in Japan the construction of road infrastructure.

---

*“Studies show that a fuel tax of around 10 US cents per litre cover at least the maintenance costs of roads.”*

---

A portion of the revenue can also be earmarked for environmental purposes, as the below example from Mexico shows.

Fuel tax can also be considered a way to implement the user-pays principle, as fuel consumption can generally be regarded as a good indication of the level of use of road infrastructure.

---

*“Fuel taxes can also help internalise the negative externalities generated by vehicles, as it is a good proxy for road use and emissions.”*

---

The main weakness of the fuel tax is that it cannot differentiate charges adequately to reflect the nature in which the vehicle is used (*e.g.* time of travel, vehicle type, axle-weight, fuel consumption, fuel type, emissions, and vehicle technology). However, unlike more sophisticated instruments such as a road pricing scheme, they are relatively easy to administer and hard to avoid. It may be considered the best alternative to implement the user-pays principle.

It is also prone to (indirect) subsidies, reflecting political pressure to keep fuel prices low. This is reflected in the level of subsidies

#### **Box 38: Fuel surcharge in Bogotá and other Colombian cities**

In Colombian cities, a 20% surcharge is collected on all gasoline sales. Half of the resources generated are used for the construction of the infrastructure required of Bogotá’s TransMilenio system. In this way, private vehicle owners (19% of the population) finance about one third of the infrastructure of the public mass transport system. The system has a 72% utilisation by low income citizens, helping to create social equilibrium in the city.

across the world, as illustrated in Box 39 and reflected in the large divergence in fuel prices internationally.

Revenues from fuel tax tend to accrue at a national rather than local level, thereby making it difficult for the instrument to be co-ordinated with urban strategies.

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*“However, there are ways in which revenue raised at the national level can be redirected for use at the local level.”*

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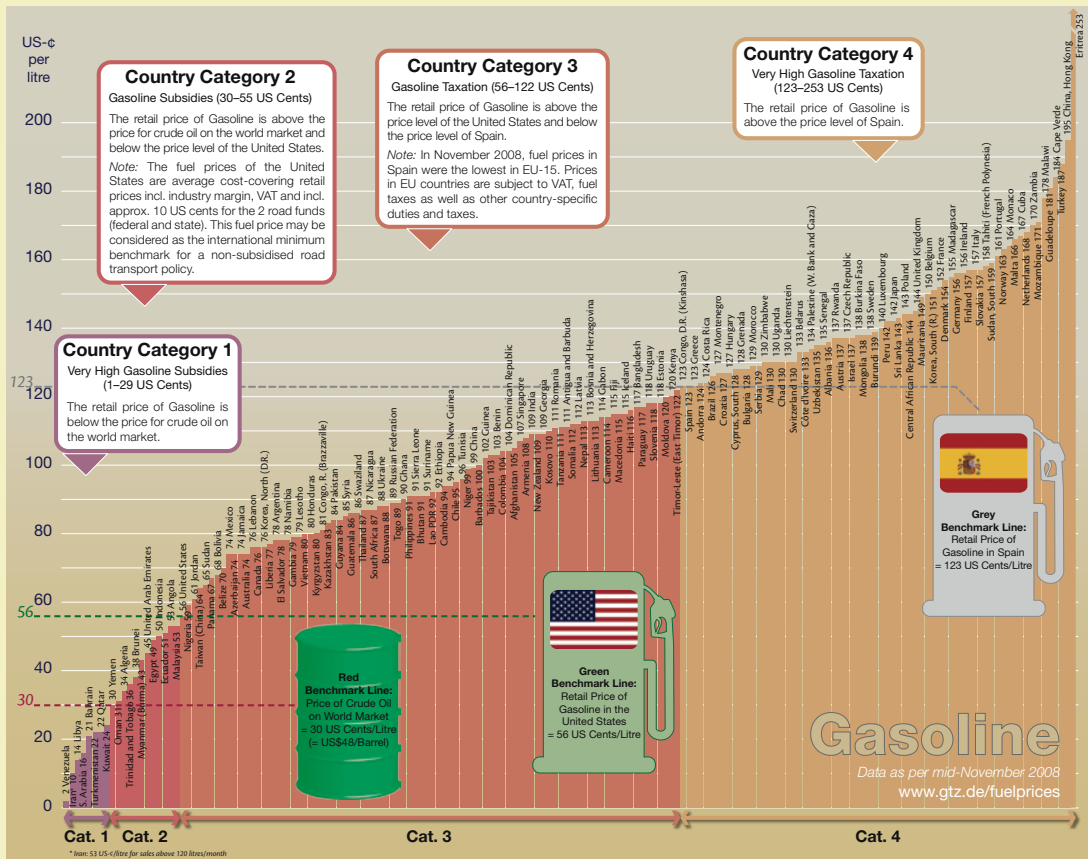
These are for example the implementation of a local fuel tax surcharge, whereby cities can levy a surcharge on the national fuel tax (an enabling legislative framework and institutional capacity and transparency are required for this approach to be effective), or redistribution, where central government gives a proportion of revenues to the local level.

### Box 39: The issue of fuel subsidies

Despite the potential of fuel taxation, many countries subsidize fuel. The GTZ Fuel Price Survey 2009 shows that countries in all regions of the world endanger their fiscal stability by actually

charging less at the fuel pump than crude oil price, processing, transport and proper transport infrastructure maintenance would require. The table below shows the countries with the highest and lowest fuel prices for each continent.

Continent	Lowest fuel price (diesel/petrol)	Highest fuel price (diesel/petrol)
Africa	Libya (12/14 US cents per litre)	Eritrea (107/253 US cents per litre)
America	Venezuela (1/2 US cents per litre)	Guadeloupe (154/181 US cents per litre)
Asia, Australia and Pacific	Iran (3/10 US cents per litre)	Hong Kong, China (116/195 US cents per litre)
Europe	Russian Federation (86/89 US cents per litre)	Turkey (163/187 US cents per litre)



**Figure 33**  
*Retail Prices of Gasoline in US cents per litre, showing a large difference in gasoline prices by country.*

Source: GTZ, 2009 based on figures from November 2008

See:

- GTZ (2009) International Fuel Prices  
<http://www.gtz.de/fuelprices>

### 3.4.2 Vehicle taxation

Basic attributes		Support for sustainable transport	
Administrative level	Local, National	■ Efficiency	++
Amount	\$\$\$	■ Equity	+++
What can it fund?	Infrastructure Maintenance Public transport Institutions Policies Traffic management	■ Environment	+++
Examples		Support for financial sustainability	
<ul style="list-style-type: none"> <li>■ Philippines – Motor Vehicle User’s Charge</li> <li>■ Singapore – Vehicle Quota System</li> </ul>		■ Stability	++
Main Decision-makers		■ Political acceptability	+
Finance ministry/treasury	<b>X</b>	■ Administrative ease	++
Transport ministry	<b>X</b>	Main considerations for policy makers	
Environment ministry		<ul style="list-style-type: none"> <li>■ Liaise with central government to set the optimal tax for the local context</li> <li>■ Consider differentiating the charge to reflect external costs</li> </ul>	
Mayor/city administration	<b>X</b>		
Local Transport authority	<b>X</b>		
Enforcement authority	<b>X</b>		
Private sector operators			
Businesses			
International organisations			
NGOs, media and civil society			

Vehicle taxation, which is also known as road taxation, is a tax on car ownership that is typically payable on an annual basis, although it is also levied on the acquisition of vehicles. It follows the principle of redistribution, meaning that more affluent groups, who are able to purchase their own vehicles, are taxed and therefore have to contribute more to infrastructure maintenance and extension than the poor.

Vehicle taxation is similar to fuel tax in that it directly falls upon those who use the infrastructure that the revenues can (if earmarked for reinvestment in the transport network) be used to support. Vehicle taxation is known to be generally the second largest source of revenue from transport, following fuel taxes.

---

*“Vehicle tax revenues tend to be allocated to the local level, despite the fact that they are often fixed nationally.”*

---

It can therefore be used to fund the maintenance of urban roads (the initial purpose of establishing road taxation), or other more sustainable forms of urban transport provision, such as public transport. Table 9 gives an example of how revenues from vehicle taxation are allocated in the Philippines.

**Table 9: Allocation of the Motor Vehicle User's Charge (MVUC) of the Philippines**

Account	Share	Exclusive Purpose
<b>Special Support Fund</b>	80.0 %	Maintenance of National Primary Roads (70 % of the 80 %) Maintenance of the National Secondary Road (30 % of the 80 %) Improvement of drainage system
<b>Special Local Road Fund</b>	5.0 %	Maintenance of Local Roads Traffic and road safety devices of city and provincial governments
<b>Special Road Safety Fund</b>	7.5 %	Installation of road safety devices throughout the country
<b>Special Vehicle Pollution Control Fund</b>	7.5 %	Programs for prevention, control and management of air pollution from mobile sources

Source: CNBL, 2008

*“The level of vehicle tax payable can be made to vary depending on a number of factors to reflect the negative externalities that they generate.”*

Vehicle tax can be varied depending upon engine size or carbon emissions. Thus, vehicle tax can be used to encourage car owners to purchase vehicles with a better environmental performance (see Box 42). Vehicle taxes can also vary based upon their likely impact upon the road network.

The US state of Oregon, for example, levies a weight-mile tax under which Heavy Goods Vehicles (HGVs) are required to pay a road tax for every mile driven in the state based upon its weight and number of axles. The level of tax payable reduces if weight decreases or if the number of axles on the vehicle increases. This is in recognition of the greater maintenance costs incurred by HGVs than for other vehicles and specifically the reduced negative impact of reduced axle loads (Cascade Policy Institute,

1995). Where an enabling legislative framework is in place, such taxation initiatives can help to ensure that HGVs are made more accountable for the maintenance costs that they incur.

The level of taxation has been found to have an impact upon demand. This has been demonstrated by acquisition taxes in Denmark and Hong Kong, which have approximately tripled the cost of cars (World Bank, 2002).

#### **Box 40: Vehicle taxation in Jakarta, Indonesia**

The city of Jakarta differentiates the level of vehicle taxation levied according to the value of the car being taxed. It does so based on the value of vehicles owned with the charge being 1.5% of the vehicle's current value. The province of Jakarta has 2 million cars and more than 7 million motorcycles, which has led to the vehicle tax revenues constituting approximately 60% of the city's total tax revenues. The nature of the differentiation makes it a more equitable tax than others as it charges more to those who in theory have a higher level of disposable income.



**Box 41: The Singapore Vehicle Quota System (VQS)**

Singapore has a unique system to directly control the growth rate of the vehicle population to manage urban congestion. The key motivation behind this system was concern that with rising affluence, existing ownership taxes were not effective in controlling the growth in vehicle population.

Under the VQS, the car buyer must obtain a license called a Certificate of Entitlement (COE). Each license allows a vehicle to be on the road for 10 years. After this period the vehicle must be de-registered or a new license has to be bought for a further 5 or 10 year period by paying a prevailing quota license premium. This system came into effect in May 1990, and every quota year beginning in May. The available quota for new motor vehicles is determined in accordance with a targeted rate of growth in vehicle population\*, and takes into

account the forecast de-registration of vehicles in the coming year. By now there are two online auctions a month on the Land Transport Authority of Singapore’s website.

The key advantage of the VQS in improving urban mobility is direct control over the vehicle population which is a key factor in urban congestion. The VQS has succeeded in controlling the growth of Singapore’s vehicle population as the annual average vehicle growth rate stayed at 3 % from 1990–2005. The system has also generated auction revenues exceeding USD 12 billion which was used to fund the Mass Rapid Transit (MRT) rail system, which has cut travel time, improved the quality of urban travel and reduced urban congestion.

\*During 2010, the maximum allowed annual vehicle growth stands at 1.5 % annually. This is regularly revised based on observed levels of congestion – once traffic speeds fall below a certain threshold, the allowed level of quota is revised.

**Box 42: Examples of Green Taxation from Europe**

Vehicle taxes can be used to offer incentives for vehicle owners to switch to low emission vehicles, as the examples for Germany, Spain and the UK, provided below illustrate.

**Germany: Tax based on CO<sub>2</sub> performance**

Germany introduced a new motor vehicle tax in July 2009. The old tax was based on engine displacement and was combined with a tax deduction for particularly ecological cars. The new tax additionally incorporates a CO<sub>2</sub> emission component. Ecologically unfriendly vehicles are subjected to a larger tax burden than environmentally friendly cars. The tax aims to:

- Lower emissions of pollutants in urban places and CO<sub>2</sub> emissions in total
- Promote further research and development in “green” vehicle technology
- Incentivize manufacturers to offer “green” cars and customers to purchase them

**France: Bonuses and Penalties based on CO<sub>2</sub> performance**

France unveiled a system of green taxes on gas-guzzling cars and bonuses for cleaner vehicles, as part of a nationwide strategy to reduce greenhouse gas emissions. From 1 January 2008, any driver who buys a new car emitting more than 160 grams of carbon dioxide per kilometre will be charged a one-off penalty. Penalties will start at EUR 200, rising to EUR 750 for emissions above 166 grams, and EUR 2,600 above 250 grams. Penalties are expected to apply to around a quarter of all new car sales, while around 30 % of buyers would qualify for a bonus based on current new car sales. The levy on polluters is used to pay out bonuses for the rest.

**Spain: CO<sub>2</sub>-tax for two-wheelers – “Impuesto de matriculación”**

Spain was one of the first European countries that taxed cars based on the CO<sub>2</sub> emission levels. This approach was extended to new motorcycles in 2009. The amount of tax paid when a buyer registers a two-wheeler is as follows:

<80 g/km of CO <sub>2</sub>	exempt from registration tax
80 – 100 g/km of CO <sub>2</sub>	4.75 % registration tax
100 – 120 g/km of CO <sub>2</sub>	9.75 % registration tax
>120 g/km of CO <sub>2</sub> or more than 100 hp	14.75 % registration tax

Motorcycles and scooters that are not environmentally friendly are therefore very expensive to run, which also encourages manufacturers to produce more environmentally friendly motorbikes.

See:

- R744.com (2008) CO<sub>2</sub> car tax in France proves success <http://www.r744.com/article.view.php?id=689>
- OECD (2008) Road Taxation Database <http://internationaltransportforum.org/statistics/taxation/index.html>
- Lehman, C *et al.*, (2003) Assessing the Impact of Graduated Vehicle Excise Duty – Quantitative Research <http://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/pgr/roads/environment/research/consumerbehaviour/assessingtheimpactofgraduate3817?page=4>

### 3.4.3 National and international loans and grants

Basic attributes		Support for sustainable transport	
Administrative level	Local, National, International	■ Efficiency	++
Amount	\$\$	■ Equity	++
What can it fund?	Infrastructure Institutions	■ Environment	++
Examples		Support for financial sustainability	
■ UK – Prudential Borrowing Mechanism		■ Stability	+++
Main Decision-makers		■ Political acceptability	+++
Finance ministry/treasury	X	■ Administrative ease	++
Transport ministry	X	Main considerations for policy makers	
Environment ministry		■ Understand the bidding process and conditions for borrowing from central sources	
Mayor/city administration	X	■ Increase ability to borrow at local level, by increasing revenue generation through stable taxes (e.g. business tax, local vehicle tax)	
Local Transport authority			
Enforcement authority			
Private sector operators			
Businesses			
International organisations			
NGOs, media and civil society			

There are often cases where raising revenue from various user charges (such as those indicated in the previous sections) are insufficient to cover all local transport expenditures.

*“Loans and grants can both be used to fund temporary shortfalls in funding at the local level.”*

They can be received from national and international sources<sup>[13]</sup>, as well as a wide range of private organisations including commercial banks.

<sup>[13]</sup> In this module, grants and loans (including those from international sources) were categorised as a “national level financing instruments” due to the fact that most cities would have access to such resources through national governments. This highlights the need for cities to liaise closely with their respective national governments to make full use of such financing opportunities.

*“Grants often need to be accessed via a competitive bidding process, and therefore tend to be allocated on the basis of a specific need or scheme.”*

They are also limited in absolute amount and may only be available on a one-off basis. The advantage of grants is that they do not require repayment in the future back to the donor. However, there may be certain conditions (e.g. purpose of use) attached to their receipt. These conditionalities should be assessed carefully, to understand any possible negative side-effects.

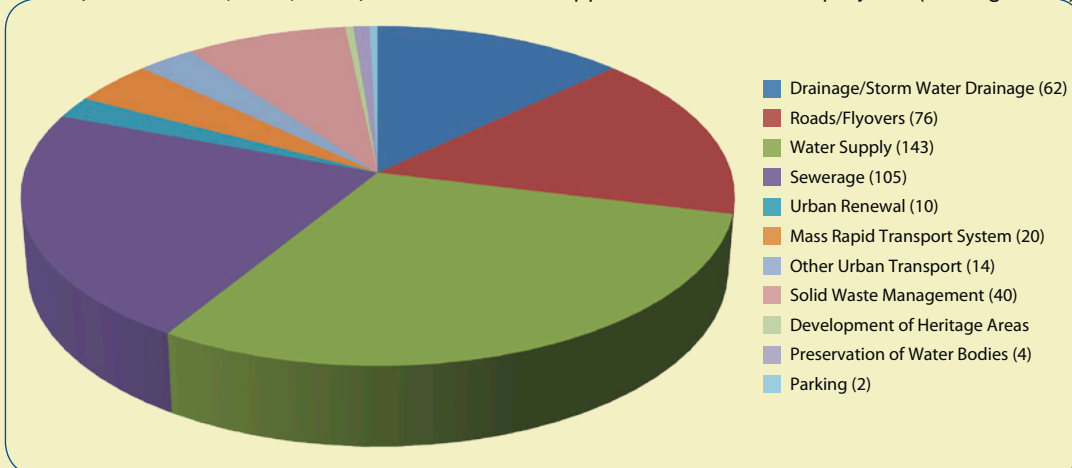
**Box 43:**  
**Grants for local authorities India:**  
**the Jawaharlal Nehru National Urban**  
**Renewal Mission**

Rapid economic growth, coupled with a fast growing urban population, and urban sprawl has resulted in increased individual housing requirements, and an ever increasing demand for mobility in Indian cities. This has exerted huge pressure on the city’s existing resources and made development patterns in the cities unsustainable. One financial instrument to improve the situation and to provide adequate infrastructure to the cities is the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). It provides a platform to coordinate significant financial support from the Central Government in urban infrastructure projects to selected cities in India, subject to the cities undertaking a set of institutional, structural, and fiscal reforms, necessary to improve their urban service delivery systems. Towards this, cities identified by the Mission are expected to formulate comprehensive City Development Plans (CDPs) for a period of 20–25

years, with 5 yearly updates, indicating policies, programmes and strategies, and financial plans. Based on the CDPs, more detailed project reports are to be developed with regard to undertakings in the sectors of land use, environment management and urban transport. Once this task is completed, the next steps are to initiate identified projects with funds from Central and State Government.

At inception of the National Urban Renewal Mission in December 2005, the total support of the Government was envisaged at INR 50,000 crores (USD 11.1 billion) with matching contribution from states and municipalities to an overall fund of around INR 100,000 crores (USD 22 billion). During 2008–2009 the commitment of the central assistance was enhanced by INR 16,500 crores (USD 3.7 billion) so that a total fund volume of INR 116,500 crores (USD 26 billion) is available.

The financial support for 112 transport and transport related projects currently amounts to USD 2 billion and constitutes a share of 23 % of all the 478 approved infrastructure projects (see Figure 34).



**Figure 34**  
*Sector wise status of approved projects of the JNNURM*

See:

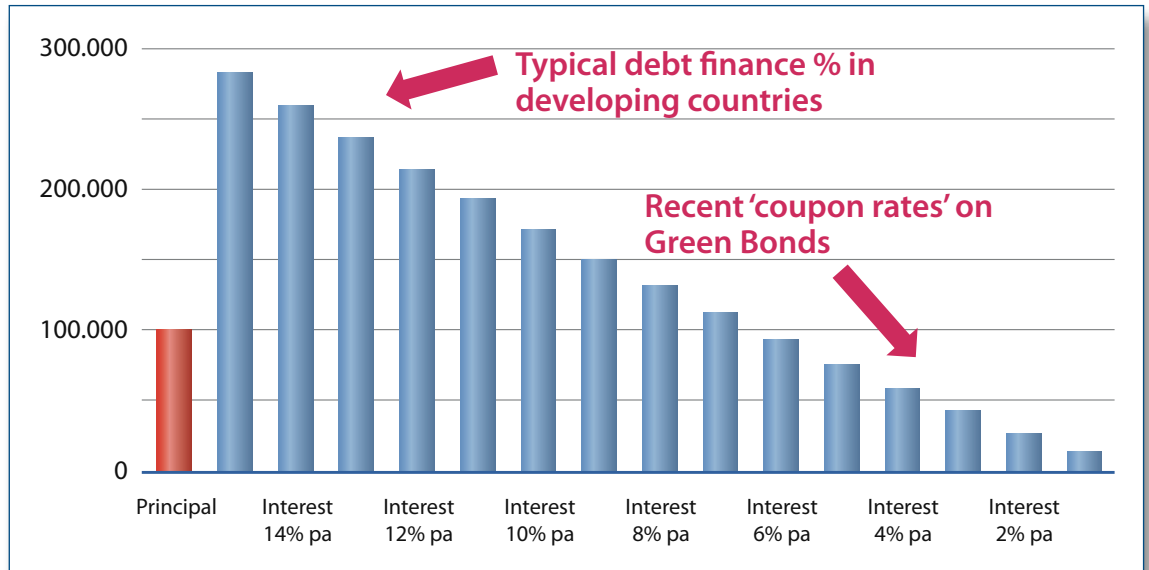
➤ Government of India (2006) <http://jnnurm.nic.in/>

*“Loans are able to provide local government with access to large amounts of capital that would not otherwise be available.”*

Loans, in particular those provided by national or international public bodies, may allow the

local authority to borrow at significantly lower interest compared to raising funding on the private market. Borrowing through such concessional loans, with a few percentage differences in the interest rate, may amount to millions of dollars of savings for the local authority over a course of the project. The Figure 35 shows that the interest payments for the same amount of principal (over a project life span of 25 years)

**Figure 35**  
*Importance of interest rates.*  
Source: Ward, 2010



**Box 44:**  
**Prudential Borrowing in the UK**

In the UK, local authorities are now allowed to borrow (from a range of sources including self-financed borrowing, government support including capital grants, capital receipts and via Health Reimbursement Investments) to invest in capital works and assets. This borrowing is allowed on the condition that the cost of borrowing is affordable and in line with principles set out in a professional Prudential Code, endorsed by the Chartered Institute of Public Finance and Accountancy – a professional body for those in public finance. Local authorities have been making use of prudential borrowing with great variation existing between authorities in the amounts invested and the purpose to which it has been put.

For example in the town of Barnet, the local council has used GBP 5 million (USD 7.4 million) of prudential borrowing each year from 2004/5 (total GBP 15 million (USD 22.3 million)) for a highway improvement programme. This programme is being carried out to meet nationally defined standards

to enhance the condition of the road network.

Prudential borrowing is also being used to fund a backlog of repairs to roads and footpaths. In 2004, this backlog was estimated at GBP 24 million (USD 35.6 million); GBP 14 million (USD 20.8million) for carriageways and GBP 10 million (USD 14.8 million) for footways. By investing in the highways through prudential borrowing, Barnet has been able to reduce its maintenance costs. This has allowed revenue budgets to be redirected to other areas of priority for the local government, specifically five initiatives designed to enhance the prospects of children and young people in the borough, support sections of the population classed as ‘vulnerable’, to improve the health and safety of the local population, and to improve the local environment.

See:

- Local Government Association (2007) Funding innovation: local authority use of prudential borrowing <http://www.lga.gov.uk/lga/publications/publication-display.do?id=22385>

would be reduced by nearly 2/3, if interest rates were to fall from a typical market rate of 12%–14% for projects in developing countries, to a concessional rate of 4%. In this case, the total cost of the project over its lifetime would be reduced by nearly 60%.

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*“It is important to liaise closely with the national government, and seek ways in which loans with more favourable conditions/interest rates can be accessed.”*

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In many developing cities, the borrowing ability for urban transport is often restricted by the availability of future revenue to support the borrowing, as well as the legal framework, which can set a limit on the amount that can be borrowed without the consent of central government. The key purpose of such limits is to ensure that borrowing is affordable, although in smaller cities this may be owing to the fact that national government needs to borrow on their behalf (World Bank, 2002).

For example, some countries have mechanisms in place that support the borrowing potential of local government. The Prudential Borrowing mechanism in the UK (see Box 44) gives transport authorities the option of borrowing either directly from the market or from the Public Works Loan Board (PWLb). The PWLB is a body that has access to funds from the UK National Loans Fund, which makes it able to offer competitive borrowing rates.

Grants and loans are also provided by foreign sources, *e.g.* in the form of official development aid (ODA). These are provided by governments of industrialised countries, either bilaterally, or through multilateral institutions such as the World Bank, providing in total billions of

dollars worth of transport investments every year. However, as noted in Chapter 2, most of the funding is channelled into road building, which does not always support the goal of sustainable urban transport.

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*“These conventional international funding sources can also be mobilised for more sustainable transport interventions, if such demands are communicated clearly by local and national governments.”*

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This is due to the fact that donor institutions generally are required to be “demand driven”, *i.e.* to respect the preferences of recipient countries. There is therefore a large role for developing city stakeholders to voice such demands (in many cases through national governments) to the donors, in shifting their funding towards more sustainable means of transport.

For further information on these international funding sources, refer to the following resources:

- World Bank  
<http://www.worldbank.org/transport/>
- Asian Development Bank  
<http://www.adb.org/Transport/default.asp>
- Inter-American Development Bank  
<http://www.iadb.org/topics/topic.cfm?id=TRAS&lang=en>
- African Development Bank  
<http://www.afdb.org/en/topics-sectors/sectors/transport/>
- European Bank for Reconstruction and Development (EBRD)  
<http://www.ebrd.com/pages/sector/transport.shtml>



### 3.5 Financing instruments at international level – with a focus on Climate Finance

*“International financing for sustainable urban transport can also be obtained from a growing body of new instruments which are designed to mitigate greenhouse gases in developing countries and cities.”*

Most of these have been created and are managed at a global level, by international institutions such as the United Nation Framework Convention on Climate Change as well as regional and bilateral institutions.

To help urban transport policy makers understand the nature of these instruments, this section provides a short overview of three representative instruments, namely:

- The Clean Development Mechanism (CDM)
- The Global Environment Facility (GEF)

#### 3.5.1 The Clean Development Mechanism (CDM)

Basic attributes		Support for sustainable transport	
Administrative level	Global	■ Efficiency	+
Amount	\$	■ Equity	+
What can it fund?	Public transport Technology	■ Environment	+++
Examples		Support for financial sustainability	
<ul style="list-style-type: none"> <li>■ BRT in Bogotá</li> <li>■ The Delhi Metro</li> </ul>		■ Stability	+
Main Decision-makers		■ Political acceptability	+++
Finance ministry/treasury		■ Administrative ease	+
Transport ministry	X	Main considerations for policy makers	
Environment ministry	X	<ul style="list-style-type: none"> <li>■ Understand the requirements for project eligibility under the CDM (see modules 5d and 5e)</li> <li>■ Learn from successful cases such as the BRT in Bogotá</li> <li>■ Keep up-to-date with new developments, especially following the COP15 in 2009.</li> </ul>	
Mayor/city administration	X		
Local Transport authority	X		
Enforcement authority			
Private sector operators	X		
Businesses			
International organisations	X		
NGOs, media and civil society	X		

- Multilateral and bilateral climate funds
- These instruments are similar to grants, in that they do not require the repayment of resources to the donor institution.

*“However, a key hurdle in accessing these resources is in proving (through measurement, reporting and verification) that any project or programme for which funding is received, has mitigated carbon emissions compared to a business as usual scenario. This is referred to as the ‘additionality criterion.’”*

For further information please refer to the Carbon finance relevant GTZ Sourcebook Modules <http://www.sutp.org>:

- 5d: The CDM in the Transport Sector
- 5e: Transport and Climate Change

The CDM is a market based instrument introduced under the Kyoto Protocol, allowing industrialised countries (with an international obligation to meet certain greenhouse gas reduction targets) to invest in projects that reduce emissions in developing countries, as an alternative to taking action in their own countries. As taking actions in developing countries is often cheaper, this allows industrialised countries to meet their targets at less cost. At the same time, it also supports the sustainable development of developing countries, which can benefit from the creation of better infrastructure and technology financed by developed countries.

Since entering into force in 2005, it has become one of the main instruments used for the funding of climate change mitigation projects in developing countries. As of 1 February 2010, there are 4926 CDM projects in the CDM pipeline – for each of these projects a country has submitted a proposal on their CDM project activity for validation and/or registration by the CDM Executive Board.

Due mainly to the difficulty of developing methodologies and collecting data to measure the reductions in greenhouse gas emissions from transport projects (which is the main criterion to receive funding through the CDM), the application of CDM to the sector has so far been limited, with only 2 projects in operation. These are the Bus Rapid Transit System in Bogotá, Colombia (see Box 45), and regenerative braking technology equipped on the metro in Delhi, India.

However, a number of other transport measures are expected to be supported in the future, these including biodiesels, cable cars, efficient operation of metro systems, modal shift from road to rail, electric scooters, and the scrapping of old vehicles. (see Table 10)

A process of reform of the whole CDM system is also under way, in order to increase the amount of support provided under CDM. This

**Table 10: Transport projects in the CDM pipeline (as of March, 2010)**

Transport sub-type	No. of projects/ PoAs	Emission reduction ktCO <sub>2</sub> /yr
Biodiesel from waste oil	2	487
Biodiesel for transport	1	19
Bus Rapid Transit (BRT)	9	1,358
Cable cars	1	17
Metro: efficient operation	1	16
Mode shift: road to rail	3	661
Rail: regenerative braking	2	58
Motorbikes	4	130
Scrapping old vehicles	1	3
<b>Total</b>	<b>24</b>	<b>2,749</b>

Source: UNEP Risø (2010) in Bakker, S and Huizenga, C (2010)

includes, for example, allowing the bundling of individual projects under a so-called “Programme of Activities” (PoA) to reduce the administrative burden associated with registering individual projects.

These reforms are occurring at a rapid pace, and readers are invited to watch the following information sources for up-to-date information.

- For transport project design documents, please go to UNFCCC (2010) Validation projects <http://cdm.unfccc.int/Projects/Validation/index.html> (select Transport in “Sectoral Scopes”)
- For information on the CDM transport project in Bogotá (UNFCCC Project 0672) <http://cdm.unfccc.int/Projects/DB/DNV-CUK1159192623.07/view>
- For information on the CDM transport project in India (UNFCCC Project 1351) <http://cdm.unfccc.int/Projects/DB/RWTUV1190204766.13/view>
- UNEP Risø (2010) CDM/JI Pipeline Analysis and Database <http://www.cdmpipeline.org/cdm-projects-type.htm#2>

### Box 45: TransMilenio Bus Rapid Transit in Bogotá, Colombia: Receiving additional funding from carbon credits

Bogotá's TransMilenio scheme is one of the two transport related CDM projects that have been approved, with CDM funding representing 10% of the total infrastructure costs. The scheme was launched in 2000 and consists of 84 km of dedicated busway, 515 km of feeder routes and the

construction of bus stations. The initiative also involved the replacement of buses that were 15 years or older with more efficient alternatives.

The success of the scheme can be demonstrated by its patronage, which is approximately 1,400,000 passengers a day. It is estimated that it will have saved an average of 246,563 tonnes of CO<sub>2</sub> equivalent per year during the seven year CDM crediting period. (Source: GTZ *Sourcebook* Module 5e: *Transport and Climate Change*)



Figures 36a, b  
*BRT Bus in Bogotá, Colombia.*

Photos by TransMilenio, 2007

For additional information please go to:

- Hensher, D and Golob, T (2008) Bus rapid transit systems: a comparative assessment <http://www.springerlink.com/content/3152628236116174/fulltext.pdf>
- Lindau, L *et al.*, (2007) Developing bus rapid transit systems in Brazil through public private partnerships [http://www.thredbo.itls.usyd.edu.au/downloads/thredbo10\\_papers/thredbo10-plenary-Linda-Senna-Strambi-Martins.pdf](http://www.thredbo.itls.usyd.edu.au/downloads/thredbo10_papers/thredbo10-plenary-Linda-Senna-Strambi-Martins.pdf)

### 3.5.2 The Global Environment Facility (GEF)

Basic attributes		Support for sustainable transport	
Administrative level	Global	■ Efficiency	+
Amount	\$	■ Equity	+
What can it fund?	Public transport Technology Institutions Policies (Infrastructure)	■ Environment	+++
Examples		Support for financial sustainability	
<ul style="list-style-type: none"> <li>■ Urban transport development in Hanoi</li> <li>■ Sustainable Urban Transport Project in India</li> </ul>		■ Stability	+
<b>Main Decision-makers</b>		■ Political acceptability	++
Finance ministry/treasury	<b>X</b>	■ Administrative ease	+
Transport ministry	<b>X</b>	Main considerations for policy makers	
Environment ministry	<b>X</b>	<ul style="list-style-type: none"> <li>■ Keep up to date with the most recent information surrounding transport-related funding by the GEF</li> <li>■ Talk to those who have succeeded in applying for funding through the GEF, and learn from their experience</li> </ul>	
Mayor/city administration	<b>X</b>		
Local Transport authority	<b>X</b>		
Enforcement authority			
Private sector operators	<b>(X)</b>		
Businesses			
International organisations	<b>X</b>		
NGOs, media and civil society	<b>X</b>		

The GEF was established to fund projects and programmes that contribute towards the protection of the global environment. It has been used to provide funding for piloting/demonstrating innovative technologies, removing barriers to transform markets and building capacity, although an often considerable proportion of co-funding needs to come from national governments or other donor agencies.

Since its establishment in 1991, USD 10.88 billion has been allocated under the scheme and four times this amount has been leveraged from other funding sources. This has been used to finance 663 'climate change' projects (as of November 2009) (Climate Funds Update, 2010). These projects have included 37 sustainable urban transport projects, which constitute USD 201 million and an additional USD 2.47 billion in co-financing (GEF, 2009). Many of these fall under Operational Program #11 ('Promoting Environmentally Sustainable Transport'), which the GEF Council approved in 2000 to enhance investment in the transport sector. The

GEF-4 replenishment process (2006 to 2010) also focused on six strategic programmes, one of which was 'sustainable innovative systems for urban transport.' Support provided by the GEF is not only financial, however, but can also be 'in kind' with many projects comprising both technical and investment support.

Key sustainable transport objectives are made explicit in their goals but its complex project approval process has often been noted as a barrier to uptake. This has not, however, stopped a variety of sustainable transport related projects having been funded through the GEF in numerous developing countries. Details of one such scheme is provided in Box 46.

### Box 46: Urban Transport Development in Hanoi, Vietnam

This project is being conducted in partnership with the Hanoi People’s Committee. It was designed to support the implementation of a sustainable strategy of city development and transport improvement with a focus upon the promotion of public transport.

The project seeks to achieve a more sustainable modal shift through an emphasis upon BRT, non-motorised transport, and non-technology measures, including traffic demand management and economic incentives. It also incorporated institutional and technical capacity building at the local level and an increased level of integration between transport and land use policies. This will accompany the establishment of high capacity busways on key corridors.



**Figure 37**  
*Bus in Hanoi, Vietnam.*  
Photo by Manfred Breithaupt, 2007

Source: CIF, 2010

See:

- CIF (2010) Clean Technology Fund Investment Plan for Vietnam [http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/vietnam\\_investment\\_plan\\_kd\\_120809\\_0.pdf](http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/vietnam_investment_plan_kd_120809_0.pdf)

### Box 47: GEF in figures

The GEF portfolio represents one of the largest sustainable urban transport programs in the world. It includes 37 projects in 73 cities worldwide. The Table 12 displays the regional allocation and the level of financing.

GEF has allocated approximately USD 201 million to sustainable urban transport projects with an average of USD 5.4 million per project. Additionally this funding was co-financed by more than USD 2.47 billion.

**Table 12: Level of financing in Sustainable Urban Transport (million USD)**

Period	GEF financing	Cofinancing	Total
07/1998 – 06/2002	30.6	30.4	61.0
07/2002 – 06/2006	45.0	293.4	338.4
07/2006 – 05/2009	125.9	2,149.8	2,275.7
<b>Total</b>	<b>201.5</b>	<b>2,473.6</b>	<b>2,675.1</b>

**Table 11: Regional distribution of GEF Sustainable Urban Transport Portfolio**

Asia	12
Latin America	11
Africa	7
Eastern Europe	4
Global	3
<b>Total</b>	<b>37</b>

Source: GEF (2009) Investing in Sustainable Urban Transport: The GEF Experience <http://www.thegef.org/gef/node/1541>



### 3.5.3 Multilateral and bilateral climate funds

Basic attributes		Support for sustainable transport	
Administrative level	Global	■ Efficiency	+
Amount	\$	■ Equity	+
What can it fund?	Public transport Technology Institutions Policies (Infrastructure)	■ Environment	+++
Examples		Support for financial sustainability	
■ Local public transport modernisation in Lviv, Ukraine (German International Climate Initiative)		■ Stability	+
		■ Political acceptability	++
		■ Administrative ease	++
Main Decision-makers		Main considerations for policy makers	
Finance ministry/treasury	X	■ Climate related funds are still in their development stage. Liaise with international institutions and inform them of the situation on the ground. ■ Learn from past experience from CDM and GEF projects internationally.	
Transport ministry	X		
Environment ministry	X		
Mayor/city administration	X		
Local Transport authority	X		
Enforcement authority			
Private sector operators			
Businesses			
International organisations	X		
NGOs, media and civil society	X		

Table 13: Climate funds available from agencies

Main Climate Funds	Administrator	Mitigation (M) or Adaptation (A)	Coverage of transport (including potential)
Climate Investment Fund (CIF) <i>Including:</i> The Clean Technology Fund (CTF), and The Strategic Climate Fund	World Bank	M	Technology Public transport Institutions Policy
Clean Energy Financing Partnership Facility	Asian Development Bank	M	Energy efficient transport
Cool Earth Partnership	Japan	M/A	Urban and transport planning
International Climate Initiative	Germany	M/A	Fuels and technology, modal shift

Source: UNFCCC, 2008

In recent years, various funds have been set up by multilateral and bilateral development agencies to augment the CDM and GEF mentioned earlier. These include those targeted at the mitigation of, and adaptation to, climate change. Table 13 summarises the representative funds currently available, which have direct reference to the transport sector. A brief explanation of each fund follows.

- **The Climate Investment Fund (CIF)** – is one such example and is intended as an interim measure until a new UNFCCC financing architecture comes into effect. USD 5–10 billion (total) is proposed for financing ‘transformation actions,’ which would include transport (*e.g.* clean vehicles and modal shift) as a target. Seven of the twelve country investment plans approved by the CTF, for example, include transport (see Box 49). The CIF provides financial support in the form of grants, loans, guarantees and equity.
- **The ADB Clean Energy Financing Partnership Facility (CEFPPF)** – was established to promote renewable energy and energy efficiency. The fund is substantial in size with a

target of USD 250 million. The applicability of the fund to transport is currently limited to three<sup>[14]</sup> transport projects (all in China).

- **The Japanese “Cool Earth Partnership”** – is another climate fund that has been created that has made reference to its application to the transport sector (including urban planning). The details of this climate fund, for example in terms of its scope and size are however, unclear at this stage.
- **The German International Climate Initiative (ICI)** – mobilises part of the revenue from the sale of emission permits under the European Union Emission Trading Scheme to fund sustainable energy, adaptation and biodiversity projects in developing countries. Transport-related projects already supported include the use of biogas from a municipal sewage plant for transport in Sao Paulo, and the energy-efficient extension and modernisation of local public transport in Lviv, Ukraine.

<sup>[14]</sup> Taken from ADB (2009) Clean Energy Financing Partnership Facility (Financed Projects).

#### Box 48: Using Climate Investment Funds to improve public transport in Vietnam

The Clean Technology Fund (CTF) is a multi-donor trust fund created in 2008 as one of two Climate Investment Funds (CIF) to provide scaled up financing for demonstration, deployment and transfer of low carbon technologies that have significant potential for long-term greenhouse gas emissions savings.

The Vietnamese government is proposing to use CTF financing to enhance urban rail projects in Ho Chi Minh City and Hanoi, and develop a comprehensive urban public transport system. Measures include:

- Strengthening linkages between transport modes (buses, other public transport, private transport modes) increasing the catchment areas of the new urban rail lines;
- Introduction of high efficiency buses (hybrid technology and cleaner fuels), urban rail/bus interchanges and integrated ticketing, park and ride facilities;
- Policy reform measures to discourage private vehicle usage and encourage public transport patronage.

See:

- CTF (2010) Investment Plan: Vietnam [http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/CTF\\_Vietnam3-4-10.pdf](http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/CTF_Vietnam3-4-10.pdf)

### Box 49: Climate Trust Fund in figures

Seven of the twelve country investment plans approved by the CTF cover transport, with the transport elements totalling an estimated USD 600 million out of a total USD 1.9 billion.

**Table 14: Transport elements funded by the Clean Technology Fund as of March 2010**

Country	Total Investment Cost (transport component)	Total size CTF allocation million \$	CTF Transport Allocation million \$	Transport components
Egypt	865	300	100	<ul style="list-style-type: none"> <li>■ Bus Rapid Transit</li> <li>■ Light Rail Transit and Rail Links</li> <li>■ Clean Technology Bus</li> </ul>
Morocco	800	150	30	<ul style="list-style-type: none"> <li>■ BRT/Tramway/or Light Rail</li> </ul>
Mexico	2,400	500	200	<ul style="list-style-type: none"> <li>■ Modal shift to low carbon alternatives (BRT)</li> <li>■ Promotion of low carbon bus technology</li> <li>■ Capacity building</li> </ul>
Thailand	1,267	300	70	<ul style="list-style-type: none"> <li>■ BRT Corridors</li> </ul>
Philippines	350	250	50	<ul style="list-style-type: none"> <li>■ BRT Manila – Cebu</li> <li>■ Institutional Development</li> </ul>
Vietnam	1,150	250	50	<ul style="list-style-type: none"> <li>■ Enhancement Urban Rail</li> </ul>
Colombia	2,425	150	100	<ul style="list-style-type: none"> <li>■ Implementation of integrated public transit systems</li> <li>■ Scrapping of old busses</li> <li>■ Introduction of low-carbon bus technologies in the transit systems</li> </ul>
<b>Total</b>	<b>9,257</b>	<b>1900</b>	<b>600</b>	

Source: Bakker and Huizenga, 2010

### Box 50: Links to other climate funds

Because many of the multilateral and bilateral climate funds are still in their setup stage, readers are recommended to access the following websites for most up-to-date information:

- Adaptation Fund  
<http://adaptation-fund.org/>
- Climate Investment Fund (World Bank)  
<http://www.worldbank.org/cif>
- Clean Energy Financing Partnership Facility (Asian Development Bank)  
<http://www.adb.org/Clean-Energy/CEFPF.asp>
- Cool Earth Partnership (Japan)  
[http://www.mofa.go.jp/Mofaj/Gaiko/oda/bunya/environment/cool\\_earth\\_e.html](http://www.mofa.go.jp/Mofaj/Gaiko/oda/bunya/environment/cool_earth_e.html)
- Global Climate Change Alliance (EC)  
<http://www.europarl.europa.eu/oeil/file.jsp?id=5637242>
- International Climate Initiative (Germany)  
[http://www.bmu.de/english/climate\\_protection\\_initiative/general\\_information/doc/42000.php](http://www.bmu.de/english/climate_protection_initiative/general_information/doc/42000.php)

### Box 51: Considering NAMAs in the funding process

Nationally Appropriate Mitigation Actions (NAMAs) are voluntary emission reduction measures by developing countries that are reported by national governments to the United Nations Framework Convention on Climate Change (UNFCCC). They are expected to be the main vehicle for mitigation action in developing countries under a future climate agreement, and can be policies, programs and projects implemented at national, regional, or local levels. NAMAs are a very new concept, and consequently there are opportunities for developing countries to define potential design options and shape concrete policy measures to support low carbon development and mobility.

The principles and guidelines for NAMAs are likely to be developed and negotiated by Parties of the UNFCCC until a climate agreement is formed. The Copenhagen Accord, which is the key outcome of the COP15/CMP5 in Copenhagen in 2009, does, however, provide an opportunity for developing country Parties to submit NAMAs (mitigation actions eligible for international support). As of

February 2010 25 NAMAs had been submitted, 14 of which make direct reference to the land transport sector (Dalkmann, H *et al.*, 2010), and the Copenhagen Accord stipulates that these may be added to every two years.

Financial support should be provided on an ad hoc basis to support these actions, providing immediate support to climate change mitigation projects. This could be provided bilaterally and also by the Copenhagen Green Climate Fund, which the Copenhagen Accord states will be established as an operating entity of the financial mechanism of the Convention. The Copenhagen Accord details a short-term commitment to provide resources approaching USD 30 billion for the period 2010–2012 but the mechanism for distributing these funds has not yet been set up and so steps to do so should be put into action soon. See:

- Dalkmann, H *et al.*, (2010) Formulating NAMAs in the Transport Sector [http://www.transport2012.org/bridging/ressources/files/1/615,567,Guidance\\_on\\_Transport\\_NAMA.pdf](http://www.transport2012.org/bridging/ressources/files/1/615,567,Guidance_on_Transport_NAMA.pdf)

### Box 52: The role of international non-governmental organisations (NGOs)

There are now a number of prominent international NGOs working to develop sustainable urban transport in developing cities. Their contributions range from high level policy advice, to practical, hands-on implementation of projects including for example in non-motorised transport, transport demand management, public transport systems (including Bus Rapid Transit), and parking policy to name a few.

- A shortlist of representative NGOs can be found from the link below, hosted by GTZ: <http://www.transport2012.org/transport-climate-change-links/>

### 3.6 Optimally combining the financing options

The various funding instruments identified in the previous three sections can be combined to ensure a good coverage of the various aspects of

sustainable transport, whilst achieving a high level of financial sustainability.

This chapter identifies the following as crucial points for consideration, when combining these individual financing instruments:

#### Box 53: The importance of embedding the sustainable financing instruments into policy processes

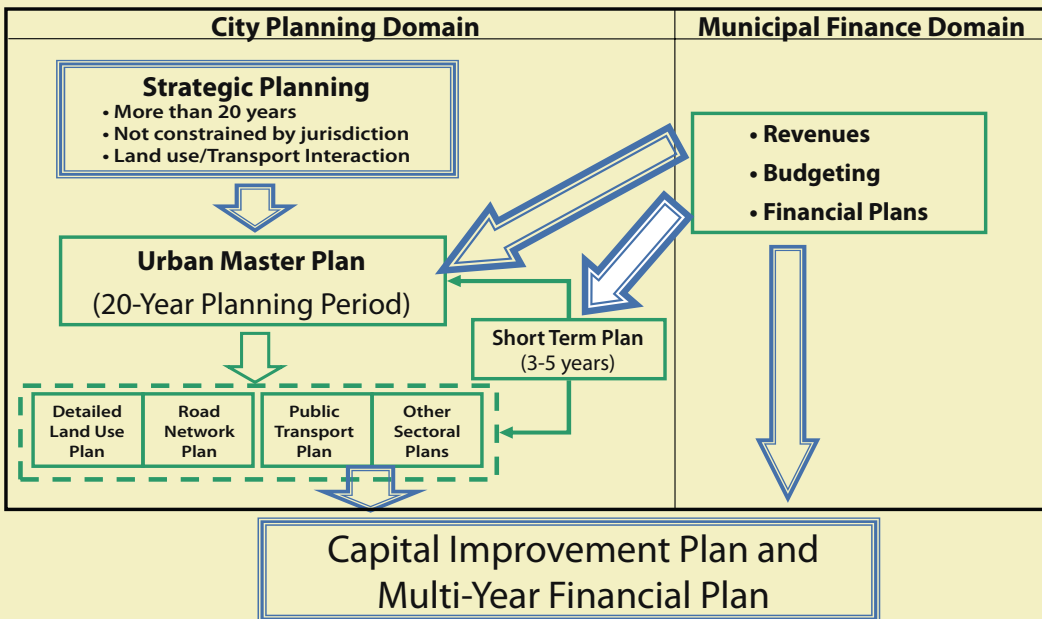
In the case of Chinese cities the lack of financial sources for transport infrastructure is not caused by revenue deficiencies but rather from the lack of integration into policy processes. There are two strategies for moving forward. The first is to “establish a link between urban transport planning and financing”, which means that cities “should adopt a planning process that establishes funding priorities and rations them in favour of the most cost-effective investments”. In this context, two effective planning tools will be necessary:

- A Capital Improvement Plan (CIP): to determine resource allocation priorities between urban transport and other sectors. The city may thus

identify the trends of development in infrastructure and set investment priorities, while maintaining the city’s fiscal integrity.

- A Multi-Year Financial Plan: to update the actual level of revenues received versus forecasted revenues and operating and capital expenditure each year. This plan aims to confirm that sufficient operating and capital revenues are available in the medium term to maintain or improve a city’s transport infrastructure.

The second strategy is to develop a sustainable and transparent financing mechanism. Transport infrastructure needs stable, predictable sources of income to improve or maintain service levels. A reasonable users-pay principle should be increasingly adopted in the city’s development policies on infrastructure.



**Figure 38**  
*A Proposed Planning and Budgeting Process.*  
Source: World Bank, 2006

See:

- World Bank (2006) China: Building Institutions for sustainable urban transport <http://www.worldbank.org/transport/transportresults/regions/eap/china-bldg-inst.pdf>

- Zhao, Z *et al.*, (2010) Funding Surface Transportation in Minnesota: Past, Present, and Prospects <http://www.cts.umn.edu/Publications/ResearchReports/pdfdownload.pl?id=1300>



- Integrate financing into a wider policy process – which includes the reform of transport prices and financial management.
- Develop a multi-tier financing system – that combines various financing approaches based on their comparative advantages, and allows both capital investments and recurrent expenditures to be fully covered.
- Consider the development of an urban transport fund – as a potential vehicle to ensure sustainable urban transport financing. Certain income sources can also be earmarked (or ringfenced) to improve the stability and predictability of resources.

These aspects are detailed below.

### 3.6.1 Integrating financing into a wider policy process including pricing reform and financial management

As highlighted in earlier sections, the issue of financing must be nested within a wider policy process, which should include pricing reform (see 2.4.3) and sound financial management (see Section 3.1). To initiate this process, it is imperative to start with a strong vision of an efficient, equitable and environmentally friendly urban transport system (see Section 2.1), and substantiate this vision with concrete policy goals against which progress can be checked. Box 53 provides an example of the challenges facing China, in incorporating financing within a larger policy process.

➤ For further information on urban transport policy and the importance of a strong policy vision, see GTZ *Sourcebook Module 1a: The Role of Transport in Urban Development Policy* <http://www.sutp.org>

*“Within this policy process, it is important to consider the strong relationship between financing instruments and efficient pricing (in pursuing the user-pays principle).”*

In other words, adopting instruments that support the user-pays principle can at the same time raise revenues which can be used to holistically finance sustainable urban transport.

*“At the same time, the issue of revenue raising must be considered in conjunction with managing expenditures.”*

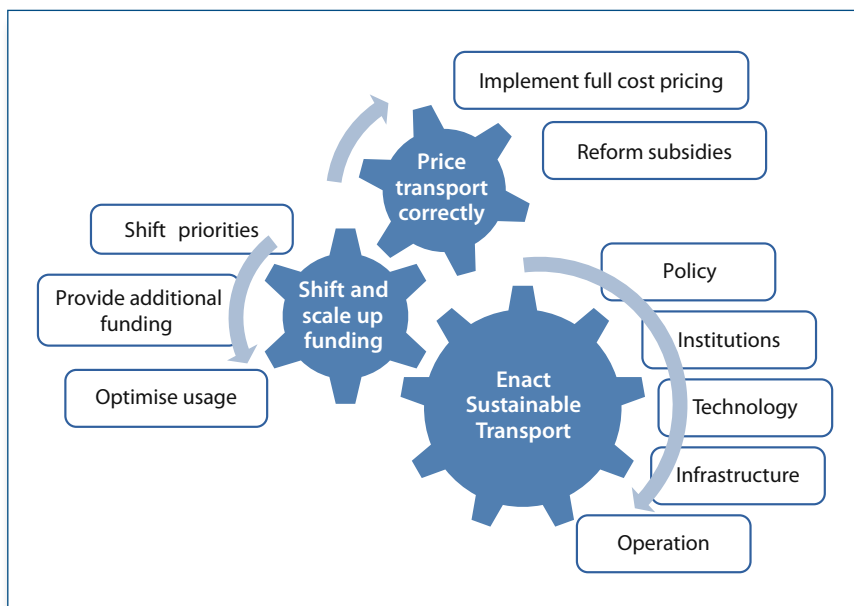
For example, phasing out subsidies (particularly on fuel) and other types of expenditures that promote unsustainable transport trends can reduce the pressures on resources.

In sum, Figure 39 illustrates how appropriate pricing practices (e.g. implementation of the user pays principle, and reforming fuel subsidies) and the shifting and scaling-up of funding (in favour of projects and programmes that support sustainable transport) can work together to enact the various components of sustainable urban transport.

Furthermore, Table 15 shows how objectives related to generating revenues and controlling expenditures can be interlinked, to create synergies towards the common objective of supporting a sustainable urban transport system.

**Figure 39**  
*Interlocking pricing and financing.*

Source: Sakamoto, 2010



**Table 15: Strategies to manage revenues and expenditures**

	<b>Move towards:</b>	<b>Move away from:</b>
<b>Expenditures</b>	<ul style="list-style-type: none"> <li>■ Transparent accounting and efficient allocation of funds</li> <li>■ Financing all aspects of sustainable urban transport, covering capital investments and recurrent expenditures</li> <li>■ Providing incentives to reduce unnecessary expenditures (e.g. through performance based contracts, targeted subsidies, tendering bus operations)</li> </ul>	<ul style="list-style-type: none"> <li>■ The biased focus on financing unsustainable transport systems and their components (e.g. urban highways and flyovers)</li> <li>■ Financing projects and programmes without securing adequate and stable funding streams for maintenance and operations</li> </ul>
<b>Revenues</b>	<ul style="list-style-type: none"> <li>■ More efficient collection of fares, taxes and fees</li> <li>■ Raising revenues from appropriately pricing unsustainable transport options (e.g. via parking charges, fuel tax, vehicle tax, and road user charging)</li> </ul>	<ul style="list-style-type: none"> <li>■ Collecting revenues from vulnerable sources</li> <li>■ Taxing and charging for sustainable transport options (fees on bikes, etc.)</li> </ul>

**3.6.2 Developing a multi-tier financing framework**

Within the framework described above, there is a need to optimally combine financing instruments so that all components of sustainable urban transport can be covered holistically.

build a system that is fit for individual contexts, *i.e.* the legal/institutional framework, or level of administrative costs. It also avoids the risks associated with an over-reliance on one particular funding stream, which may be prone to large fluctuations in available volume over time.

*“A multi-tier financing system can cover the various costs of urban transport in an effective and efficient way.”*

*“The mix of financing instruments must cover both capital and revenue spending.”*

Instead of relying on one source of finance, providing a mix of financial instruments helps

Revenue funding typically refers to maintenance and operational costs, such as staff working time, whereas capital funding can be defined as a fixed investment. Almost all forms

**Table 16: Contributions of key actors to financing urban transport**

	<b>Public sector</b>	<b>Private sector</b>	<b>Transport users</b>
<b>Capital investments</b>	<ul style="list-style-type: none"> <li>■ Direct financing of infrastructure</li> <li>■ Setting up land value taxes and development charges</li> <li>■ Setting up PPP contracts</li> </ul>	<ul style="list-style-type: none"> <li>■ Financing infrastructure through PPPs</li> <li>■ Paying land value taxes and development charges</li> </ul>	<ul style="list-style-type: none"> <li>■ Paying road user charges and taxes, fuel taxes, etc.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>■ Earmarking funding for maintenance</li> <li>■ Setting up performance based contracts</li> </ul>	<ul style="list-style-type: none"> <li>■ Conducting maintenance through performance based contracts</li> </ul>	<ul style="list-style-type: none"> <li>■ Paying road user charges and taxes</li> </ul>
<b>Operation</b>	<ul style="list-style-type: none"> <li>■ Formalising public transport operations through effective regulation</li> </ul>	<ul style="list-style-type: none"> <li>■ Operating public transport systems (e.g. via a franchise scheme)</li> <li>■ Generating revenue from property development around a public transport corridor</li> </ul>	<ul style="list-style-type: none"> <li>■ Paying for public transport through fees</li> </ul>

of policy require a combination of capital and revenue funding, which reinforces the necessity for urban transport funding portfolios to be comprised of a range of economic instruments.

Focusing on three key areas of urban transport:

- **Capital investments for infrastructure and technology** could be covered by financing instruments which allow large resources to be mobilised. This may centre upon vehicle taxes, fuel taxes and loans. Infrastructure expansion could be paid for by collecting development charges or added land value taxes.
- **The maintenance** of physical assets could be financed by the users of the transport system, through *e.g.* fuel taxes and road user charges.
- **Operation** of public transport can also be covered by fare box revenue, earmarking sales and property taxes, capturing increases in land value and property development. Revenues from road user charges and parking charges can also be reinvested into improving public transport operations.

These aspects are summarised in Table 16 which shows the contributions of key actors (as described in Chapter 1) to the multi-tier financing framework, and detailed further in the sections below.

### Financing capital investments

Investments in transport infrastructure involve a large amount of financial resources (often billions of dollars), and decisions are often taken at national level. Local level policy makers must therefore fully communicate the local needs with regards to sustainable transport infrastructure with national stakeholders.

Because of the large volumes of financial resources involved, the construction of infrastructure tends to take the form of either public borrowing or private financing (or a mixture of the two), each with their associated advantages and disadvantages. These are summarised in Table 17. Key advantages of private finance include greater efficiency, transfer of risk and a reduced reliance on public borrowing. However,

**Table 17: Advantages of public and private financing**

Advantages of public financing	Advantages of private financing
<ul style="list-style-type: none"> <li>■ Lower cost of borrowing</li> <li>■ Reduced transaction costs, easier contract arrangements</li> <li>■ Profits remain in the public sector</li> </ul>	<ul style="list-style-type: none"> <li>■ Reduced need of public borrowing</li> <li>■ Operate faster and more cost-efficient</li> <li>■ Risk is transferred to private sector</li> <li>■ User-pay principle easier to justify</li> </ul>

Source: Audit office of New South Wales, 1997

international experience shows that private involvement may come at the cost of higher transaction costs – the costs incurred in the exchange with a private financier rather than a public agency. Land value taxes and development fees are another way of financing infrastructure, making use of the extra value created to the beneficiaries as a result of the provision of infrastructure.

Many lessons have been learnt in the last 20 years regarding various models of infrastructure financing. Please consult the following GTZ *Sourcebook* for an extensive discussion on this topic:

- GTZ *Sourcebook* Module 1c: *Private Sector Participation in Urban Transport Infrastructure Provision*  
<http://www.sutp.org>

### Financing maintenance

Many countries worldwide are faced with the problem of insufficient funding for the proper maintenance of infrastructure, leading to losses in road asset value and increased vehicle operating costs. It is estimated that more than USD 30 billion are being wasted every year in Latin America alone.

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***“It is crucial that financing for maintenance is adequately secured. Roughly 4 % of the asset value should be secured for maintenance annually.”***

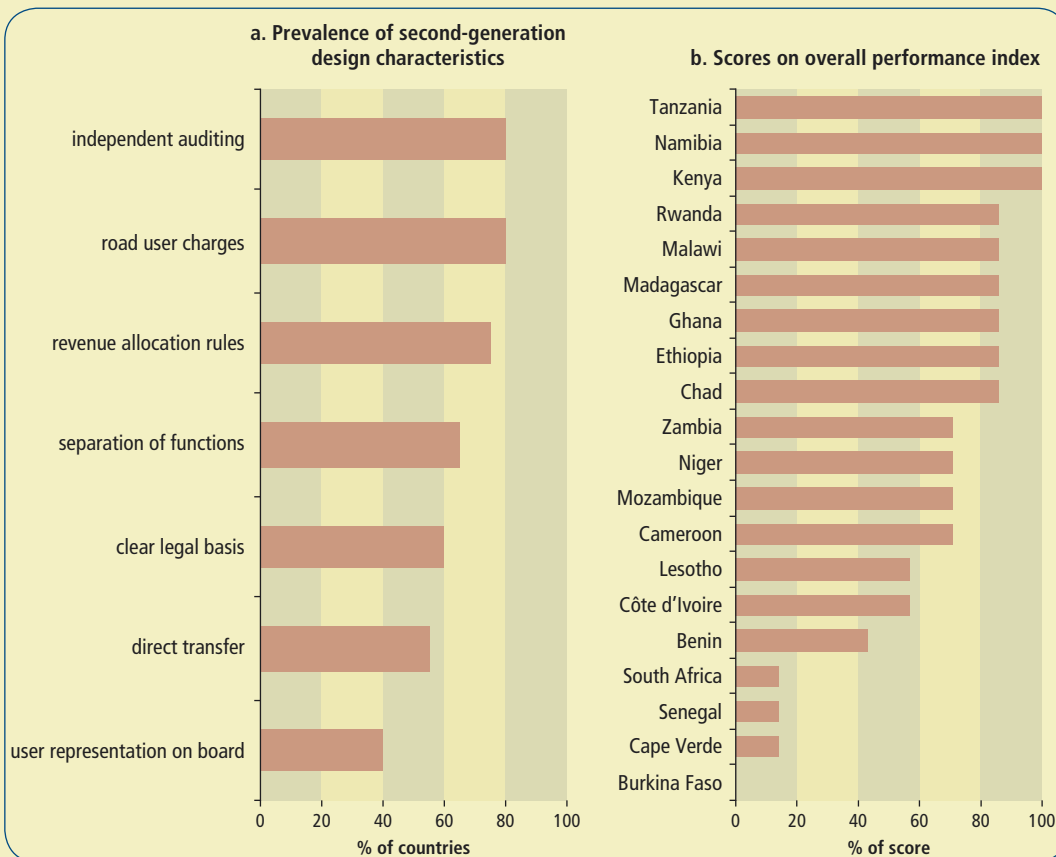
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Where financing through the general budget cannot offer a stable source of funding for maintenance, road maintenance funds have been created and have shown to be effective in securing adequate resources for this purpose, in places such as Africa (see Box 54). Here, road

**Box 54: Securing resources for revenue spending -  
Second generation road funds in Africa**

Many African countries have historically suffered from the lack of resources for the maintenance of roads, leading to substantial road asset erosion and increases in vehicle operating costs. A recent study by the World Bank shows that 1.9 billion USD of capital spending on rehabilitation could have been avoided by sound, preventative maintenance.

Since the mid-1990s, a new generation of Road Funds, replenished mainly by fuel levies and managed by independent Road Fund Administrations, have provided stable sources of financing for maintenance. As a result, many countries including Tanzania, Namibia and Kenya have drastically improved the status of their roads (see Figure 40, which shows an assessment of national road funds in selected African countries).



**Figures 40a, b**  
*Progress with Road Fund Reforms in Africa.*

Source: World Bank, 2010

See:

➤ World Bank (2010) Africa's Infrastructure – A Time for Transformation  
<https://www.infrastructureafrica.org/aicd/flagship-report>

➤ GTPK (2010) Road Funds  
<http://www.gtkp.com/uploads/20100427-011154-4099-Road%20Funds.pdf>

charges (*i.e.* fuel tax revenue) are typically channelled into an independent fund managed by a commercialised agency which implements the maintenance work.

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*“As a rule of thumb, a level of revenue equal to 10 US cents per litre of fuel is usually adequate to cover the costs of maintenance for the whole road network of a country. Mechanisms must be in place to channel such national-level resources to the local level.”*

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### Financing the operation of public transport

As previous sections have highlighted, public transport in many developing countries suffer from their informal unregulated nature.

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*“Financing the operation of an effective public transport network needs to be seen in the context of a wide-ranging reform of the regulatory environment.”*

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Experience by the development community including World Bank (2002) suggests the need to identify the right type of regulation for varying contexts (*e.g.* liberalised entry in small cities vs. franchising in larger cities) as well as ways in which reform can be made to work.

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*“The use of individual instruments such as fare box revenue, subsidies and advertising need to reflect these lessons learned.”*

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For instance, fares should be set to allow integration between modes, preferably at the local level. Subsidies should be carefully determined so as not to undermine the financial sustainability of the city budget, and thereby the collapse of the transport service as a whole. Where subsidies are to be used to support the poor, subsidies that target disadvantaged groups (*e.g.* through

### Box 55: Ten critical requirements for bus reform in developing countries

1. Political commitment to the reform is essential.
2. A proper legal foundation is necessary.
3. A strong local institutional foundation is required.
4. Design of the franchising system must realistically reflect social objectives.
5. Fares control must be consistent with financial viability of franchisees.
6. The administrative agency must be expert and trustworthy.
7. Industry restructuring must be provided for.
8. Sub-contracting should be strictly limited.
9. Vested interest of public enterprises must be confronted.
10. Good monitoring and enforcement is essential.

See:

- Gwilliam, K (2005)  
[http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/bus\\_franch\\_gwilliam.pdf](http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/bus_franch_gwilliam.pdf)

Readers are also recommended to consult the following sources for a detailed discussion.

- GTZ Sourcebook Module 3c: *Bus Regulation and Planning*  
<http://www.sutp.org>
- World Bank and PPIAF (2007b) *Urban Bus Toolkit*  
<http://www.ppiaf.org/documents/toolkits/UrbanBusToolkit/assets/home.html>

discounted travel cards) are likely to be more effective compared to subsidising the whole system across all users.

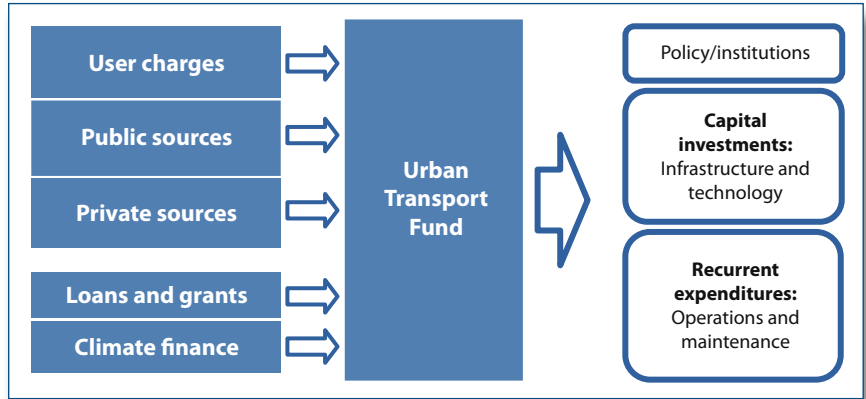
After having introduced private bus operations under competitive terms in a well-regulated market, many urban bus operators in developing cities do not require operational subsidies. This applies also to BRT systems (see Box 55).



**3.6.3 Urban transport funds: a potential way forward for cities**

*“Urban transport is a complex system in which various components must work together effectively. This calls for an integrated financing structure at the urban level.”*

One option is for all (or most of) the financial streams to be administered through an urban transport fund, which would be managed at city/municipal level, and “play host” to the multi-tier financing framework indicated in the previous section. The exact scope and scale of such a fund would need to take into account the local context – however they may be a way of collecting revenue from user fees, local taxes, transfers from central government (e.g. part of the fuel tax revenue), ODA, carbon financing mechanisms and private funding, and allocating it according to the city’s sustainable transport strategy (see Figure 41).



*“National governments and the international community can assist urban transport funds by providing institutional, financial and political support.”*

Such funds are already seen in countries such as India (see Box 56), and have the potential to support sustainable transport objectives in a way which is consistent with local priorities.

**Figure 41**  
 Concept of an urban transport fund.  
 Adapted from: Sakamoto, forthcoming

**Box 56: Urban transport funds and Unified Metropolitan Transport Authorities (UMTAs) in India**

India is a good example of where local transport funds have been set up. In the city of Surat for example, vehicle taxes, parking charges and advertisement fees are collected into an urban transport fund and used to support its urban mobility plan, which includes the expansion of bus services and modification of three-wheelers to power on CNG. In the twin-cities of Pimpri-Chinchwad, the development of a 130 km BRT network is underway, funded through an urban transport fund to which fares, revenues from monthly passes, advertisement fees and land related taxes (e.g. development rights around the BRT corridor, and property tax) are fed. (Centre for Science and Environment, 2009)

India is also active in promoting Unified Metropolitan Transport Authorities (UMTAs), which is aimed at coordinating the planning, implementing, and managing urban transport. An example of a UMTA can be found in the city of Hyderabad, where the provincial Government of Andhra Pradesh has passed legislation to allow the UMTA to make decisions on all major transport infrastructure projects and direct the various agencies that are involved in implementing transport policies. (PwC, 2008)

See:

- Centre for Science and Environment (2009)
- PwC (2008) Urban Transportation Financing [http://www.pwc.com/en\\_IN/in/assets/pdfs/urban-transportation-financing.pdf](http://www.pwc.com/en_IN/in/assets/pdfs/urban-transportation-financing.pdf)

*“Earmarking certain revenue may help improve political acceptability and the financial stability of urban transport funds.”*

As several examples throughout this *Sourcebook* module has shown, it is often desirable for revenue from one or more instruments to be earmarked, or ringfenced for a specific purpose (e.g. the London Congestion Charge for improving bus service quality, and the Mexican

Environmental Trust Fund for funding environmental transport projects). A further example is the Japanese Road Fund (or Doro-Tokutei Zaigen), which is explained in the box below.

Earmarking can ensure a steady flow of revenue, allowing long-term objectives to be pursued and met. It may also improve political acceptability

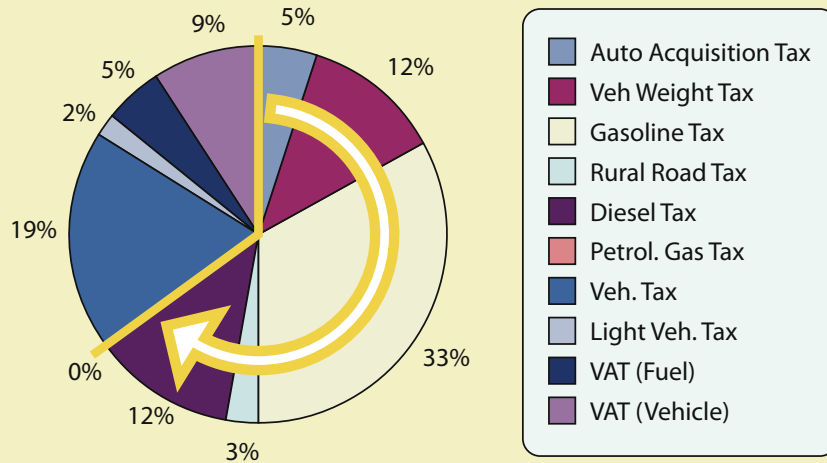
by allowing payers to directly observe and perceive the benefits.

It is important however, that the allocation of revenue be reviewed from time to time to ensure that resources are spent in the most efficient and effective way possible, and that they reflect changing priorities.

**Box 57: The Japanese Road Fund**

In Japan, dedicated funds at both national and local level draw on automobile-related taxes such as fuel tax, automobile acquisition tax and vehicle weight tax (i.e. ownership tax) to fund the construction and maintenance of road infrastructure.

Automobile related taxes account for 10 % of the national public revenue, 65 % of which is reinvested in the road sector through these funds. Taxes are raised at both national level and local level, and are earmarked to fund road-related infrastructure. Some of the tax revenue at the national level are transferred as subsidies to local schemes.



**Figure 42**  
*Split of automobile-related taxes and segment (shown by arrow) used directly for reinvestment into the road sector through road funds.*

Source: JAMA, 2005

**Box 58:**

**Questions and actions from Chapter 3: in moving towards a sustainable system**

The following questions and actions may help guide the process of moving the financing regime towards one which supports a sustainable urban transport system.

Questions 	Actions
<ul style="list-style-type: none"> <li>■ Which parts of the urban transport system are currently inadequately or improperly funded? Are there links between the missing elements, or is there an underlying problem that undermines multiple elements?</li> </ul>	<ul style="list-style-type: none"> <li>■ Allow the various stakeholders to work together to identify the main gaps in funding. Then, seek ways in which these gaps can be filled, using the instruments introduced in Section 3.3 onwards.</li> </ul>
<ul style="list-style-type: none"> <li>■ Which financing instruments are currently used to finance transport projects?</li> </ul>	<ul style="list-style-type: none"> <li>■ Review the current instruments against their ability to support a sustainable transport system, and contribute to a stable, politically acceptable and administratively viable regime.</li> </ul>
<ul style="list-style-type: none"> <li>■ To what extent are carbon financing instruments such as the GEF used in supporting a move towards sustainable transport?</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the nature of the funding opportunities available through the various climate-related funds. Learn from successful applications made in the past, e.g. for the CDM and GEF.</li> </ul>
<ul style="list-style-type: none"> <li>■ Are decisions on financing linked to those on pricing and sound management of resources?</li> </ul>	<ul style="list-style-type: none"> <li>■ Choose financing instruments which also help price transport correctly.</li> <li>■ Reduce unsustainable expenditures (e.g. on road network expansion) and subsidies (particularly on fossil fuels).</li> </ul>
<ul style="list-style-type: none"> <li>■ How are the various financing instruments currently combined to fund urban transport?</li> </ul>	<ul style="list-style-type: none"> <li>■ Ensure that the advantages of each instrument are combined in an effective way, taking into consideration the institutional and political feasibility of various combinations.</li> </ul>
<ul style="list-style-type: none"> <li>■ Are there attempts to integrate the various financing streams to ensure a well-coordinated scheme that supports urban transport as a system?</li> </ul>	<ul style="list-style-type: none"> <li>■ Plan and combine financing instruments based on an overall strategic transport plan and a supporting multi-year financial plan that provides the general direction for sustainable urban transport development for the city.</li> <li>■ Consider the setup of an Urban Transport Fund, supported by a unitary body responsible for the planning, implementation and management of urban transport.</li> <li>■ Consider earmarking certain revenues to support sustainable urban transport which may otherwise be eroded.</li> </ul>

## 4. Summary of key points and necessary actions

This *Sourcebook* module explored the role of financing in supporting and enacting a sustainable urban transport system. Here we provide a summary of the key messages and necessary actions.

The challenge facing policy-makers can be described as twofold:

- **To finance a sustainable urban transport system** – one that uses resources efficiently to carry people and goods, supports equality of access to support the needs of the whole society, and protects the natural environment – and
- **To finance it sustainably** – especially taking into consideration the stability of the revenue/expenditure stream, the political acceptability of the financing scheme, and the administrative/institutional burden of the arrangements.

Financing must cover all aspects of urban transport, including:

- **Capital investments for infrastructure** – which are normally expensive, fixed assets such as railways, busways, cycle paths, tramlines, stations, roads and bridges. This also includes investments in new *technologies*, such as the purchase of vehicles, as well as system-wide technologies such as Intelligent Transport Systems (ITS). Such investments normally require large levels of financial resources, and are often not met solely from local sources. Therefore, the role of national governments and international donors (through the provision of loans and grants, as well as leveraging private capital) become important.
- **Recurrent expenditures** – which require a continuous stream of financial resources long after the capital investments take place. This includes the *operation* of public transport, paratransit and other transport services, the *maintenance* of infrastructure<sup>[15]</sup>, *administrative costs* for city administrations, police, and other public functions, support for

*policies and programmes* – such as legislation, regulation and traffic rules, air quality management programmes, safety campaigns, and *traffic management* – including signalling, bus lanes, priority at crossings, etc. Such expenditures should generally be met by users of the transport system (e.g. via road tolls, public transport fares).

In meeting this challenge, the key existing barriers need to be understood and overcome. These include:

- Trends in economic development – which results in rapid urbanisation, income growth and developments in other sectors of the economy, leading to increased demand for motorised transport.
- Bias towards unsustainable transport funding – by national and local governments, as well as donors, particularly on infrastructure for motorised private transport.
- Prices that do not reflect true costs – whereby motorists are not charged the full costs of his/her travel activity, such as those imposed on others in society through increased congestion, accidents, infrastructure wear and tear, air pollution, noise and climate change.
- Governance and institutional factors – including the lack of institutional capacity to raise and manage funding at the local level, poor coordination and fragmentation of responsibilities between the relevant (transport) authorities (*i.e.* between modes, between infrastructure and operations, and between pricing and service provision).
- Public acceptability – whereby care must be taken to minimise public resistance to the implementation of new financing instruments.

In moving forward, policy makers can begin by understanding and managing the financial requirements for sustainable urban transport. An assessment of current financing gaps can be made at this initial stage (see Table 4 in Section 3.1).

Specific financing instruments at the national, local and international level can then be examined, and ways in which their application to increase the effectiveness (in terms of support for sustainable transport) and the financial sustainability of the overall funding arrangement can be considered. These are summarised

<sup>[15]</sup> This includes rolling stock and vehicles for e.g. public transport.

in the following two tables, whereby Table 18 references the individual instruments against the main components of sustainable urban transport they may support, whereas Table 19

assesses their relative levels of support for sustainable transport objectives (efficiency, equity and environment) as well as their contribution to financial sustainability.

**Table 18: Overview of financial instruments (1)**

Level of implementation	Instrument	Amount typically involved	Main components supported						
			Infrastructure	Maintenance	Public transport	Technology	Institutions	Policies	Traffic Man.
Local	Parking charges	\$		X	X		X		X
	Road pricing/congestion charge	\$\$	X	X	X	X	X	X	X
	Employer contributions	\$\$	X	X	X				
	Fare box revenues	\$\$			X				
	Public transport subsidies	\$			X				
	Land development/land value taxes	\$\$\$	X		X				
	Public private partnerships	\$\$	X	X	X	X			
	Advertising	\$		X	X				
National	Fuel taxes/surcharges	\$\$\$	X	X	X		X	X	X
	Vehicle related taxes and charges, including auctioning of quotas	\$\$\$	X	X	X		X	X	X
	Loans and grants	\$\$	X				X		
Global	CDM	\$			X	X			
	GEF	\$	X		X	X	X	X	
	Multilateral/bilateral climate funds	\$	X		X	X	X	X	



Table 19: Overview of financial instruments (2)

Level of implementation	Instrument	Support for sustainable transport objectives			Support for financial sustainability		
		Efficiency	Equity*	Environment*	Stability	Political acceptability	Administrative ease
Local	Parking charges	+++	+++	++	++	+	+
	Road pricing/congestion charge	+++	+++	+++	++	+	+
	Employer contributions	++	++	++	+++	++	++
	Fare box revenues	++	++	++	++	++	+
	Public transport subsidies	+	++	+	+	+++	+
	Land development/land value taxes	++	++	++	++	++	+
	Public Private Partnerships	++	+	+	++	++	+
	Advertising	+	+	+	+++	+++	++
National	Fuel taxes/surcharges	+++	+++	+++	+++	+	+++
	Vehicle related taxes and charges, including auctioning of quotas	++	+++	+++	++	+	++
	Loans and grants	++	++	++	+++	+++	++
Global	CDM	+	+	+++	+	+++	+
	GEF	+	+	+++	+	++	+
	Multilateral/bilateral climate funds	+	+	+++	+	++	++

\*Note: Effects on equity and the environment vary depending on how the revenue is used. Here we only consider the first-hand effects – i.e. those which arise through the collection of the revenue and not the usage thereof.

These individual instruments can be combined in a manner that ensures a good coverage of the various aspects of a sustainable urban transport system, a high level of financial sustainability, and a large degree of political acceptability.

The exact mix of instruments is highly dependent on the local context. However, the following are crucial points for consideration, when combining these individual financing instruments:

- **Integrate financing into a wider policy process** – which includes the reform of transport prices and financial management.
- **Develop a multi-tier financing system** – that combines various financing approaches based on their comparative advantages, allows both capital investments and recurrent expenditures to be fully covered.
- **Consider the development of an urban transport fund** – as a potential vehicle to ensure sustainable urban transport financing. Certain income sources can also be

earmarked (or ringfenced) to improve the stability and predictability of resources.

The various case studies in this *Sourcebook* illustrate the need for financing to be considered in the larger context of developing a coherent urban strategy for sustainable transport and city development, as well as the importance of the institutional and regulatory environment.

Policy-makers involved in the financing of urban transport are therefore urged to:

- Develop a long-term vision and strategy for a sustainable urban transport system.
- Manage the existing transport system to enable the beneficiaries to be supportive of any new or innovative financing mechanisms.
- Work towards integrating different modes of transport, through *e.g.* integrated ticketing.
- Ensure a dialogue between institutions with a stake in urban transport financing, including national government departments, transport operators (including the private sector),

enforcement agencies, and international funding agencies.

- Combine the issues raised in this *Sourcebook* module with local expertise and knowledge, and ensure that changes are made in a way that is coherent with the local context and priorities.

## Resource Materials

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