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Financing Sustainable Urban Transport

International Review of National Urban Transport Policies and Programmes

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Project Context

The Sino-German Climate Change Programme aims at supporting climate change mitigation and adaptation efforts in China. The four-year Programme is composed of three components:

1. Capacity building for Chinese officials and experts;
2. Development of mitigation strategies for the transport sector;
3. Development of mitigation strategies for the power sector.

The Programme is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

Within the field of Low Carbon Transport Development, the Programme aims to support national institutions in developing a climate protection strategy in the transport sector and to implement measures and incentive structures with a special focus on urban transportation. Assessing current and future GHG emissions lies at the core of designing a coherent and effective climate strategy. The Low Carbon Transport Development component therefore supports the development of tools to quantify and monitor GHG emissions in the Chinese transport sector both at the national and urban level.

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Introduction

Sustainable urban transport (SUT) systems are urgently needed in developing and emerging economies world-wide. Fast rates of motorisation, especially increases in private car ownership and travel have already turned congestion, air pollution and noise into common problems in many emerging and developing cities. Due to lost time and higher transport costs, road congestion is estimated to cost Asian economies 2–5% of GDP per year already (ADB, 2013). Asian cities also suffer from the highest air pollution levels in the world with transport being one of its largest contributors. In China alone, air pollution is estimated to have caused about 1.2 million premature deaths in 2010 (The Lancet, 2012). Road accidents further increase the toll of growing motorised mobility.

As the number and size of cities is growing, cities are increasingly facing challenges to develop high-quality infrastructure and operation for all modes, especially sustainable modes such as walking, cycling and public transport. Urban mobility is not merely a local concern; it is of national interest. National urban transport policies and programmes are an opportunity for central governments to help cities cope with the related challenges while achieving national economic, environmental and social objectives.

This report is written to inform decision-makers in China, but is also relevant for other countries facing similar challenges. It presents an analysis of a variety of financing and planning practices world-wide in order to help decision-makers identify suitable elements for their local context.

The study assesses international experiences regarding national policies and programmes^[1] to support sustainable urban transport. It presents insights into urban transport arrangements in eight countries: Brazil, Colombia, France, Germany, India, Mexico, the United Kingdom and the United States of America. The choice of countries provides a spectrum of promising solutions, shows a broad range of different approaches from various continents and contexts and includes both developed and emerging economy countries.

^[1] National Framework is used throughout this study as a generic term for National Policies and Programmes.

Chapter 1 analyses the challenges for urban transport development in China, and the different policies already implemented at the national level to face them, emphasizing financial and institutional aspects. Chapter 2 gives an overview of the national programmes for financing SUT systems in the eight selected countries. Chapter 3 briefly describes the two major models of urban transport financing arrangements identified after the analysis of the eight selected countries: Centralised Funding Programmes (CFP) and Decentralised Financing Policies (DFP). Chapter 4 then provides a comparative analysis of both models regarding their institutional, planning and financing frameworks, as well as the way they approach capacity building at the local level. Finally, Chapter 5 draws conclusions.

Further reading

This study is based on considerations and findings of the following two publications:

1. The Workshop Summary Report “*Financing Sustainable Transport Prospects for National-Level Programmes and Funds for Sustainable Urban Transport in China*” by GIZ, EMBARQ and SloCat (2012) available at <http://sustainabletransport.org/final-workshop-summary-report-on-financing-sustainable-urban-transport>.
2. Country fact sheets on National Urban Transport Policies and Programmes of 8 Countries by GIZ and EMBARQ, available online at <http://climatepolicy.cn/en/downloads/9> under 1-Nov-2012 Workshop on Financing Sustainable Urban Transport.

1 Challenges for urban transport development in China

Due to rapid urbanisation and motorisation in China there is a need for huge investment in the development of transport infrastructure and services. There is also a need to create continued sources of funding for their operation and maintenance. Advancing and keeping mobility infrastructure and services is a joint challenge for national and local governments. Some big cities in China have already started implementing sustainable transport infrastructure programmes as well as sustainable transport related policies and measures. Also, most of the larger cities in China are increasingly engaged in researching and implementing good practices on sustainable transport financing and policy-making. However, other (mostly smaller) cities still lack the capacity and financial resources to improve their sustainable transport systems and policies. But these cities, which are mostly at early stages of motorisation, have great opportunities to avoid being trapped in car-oriented urban development by adopting sustainable transport strategies that also increase their quality of life.

Under the current institutional set-up in China, cities are responsible for financing the development, operation and maintenance of transport infrastructure and services within their jurisdictions. The role of national level government bodies is to formulate transport and urban development strategies, including major objectives for sustainable urban transport policies. The national level government also sets the fiscal framework and approves large infrastructure investments. In some cases (as it happens in intercity/provincial corridors) project development is also a responsibility of national agencies. These activities are distributed across multiple institutions: The Ministry of Transport (MoT), the Ministry of Housing and Urban-Rural Development (MoHURD), the National Development and Reform Commission (NDRC), and the Ministry of Public Security (MoPS).

MoT develops China's strategic transport policies and is responsible for all national transport infrastructures (road, rail, waterborne transport, aviation)^[2]. When it comes to urban transport, however, the MoT is only responsible for the supervision of public transport, while MoHURD is responsible for overseeing city and transport planning, as well as construction of urban transport infrastructure (including metro). For major infrastructure construction projects, such as metro development, investments need to be authorised by the NDRC. Finally, traffic operation and road safety lies within the responsibility of the Ministry of Public Security. This distribution of responsibilities is mirrored in departments at the local level.

Under this institutional setting, China is advancing multiple initiatives; nevertheless it seems clear that there is a need for



Fig. 1: Workshop on “Prospects for National-Level Programmes and Funds for Sustainable Urban Transport in China”: 25 international and Chinese workshop participants.

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^[2] The former Ministry of Railways was incorporated into the Ministry of Transport in March 2013.

Current challenges in China — Results from an international expert workshop

China has implemented an ambitious set of policies and programmes aimed at strengthening urban public transport and non-motorised transport over the last decade. In 2005, the country started its Public Transit Priority policy, which since then has been updated and expanded on a regular basis. In 2008, the new Ministry of Transport (MoT) took over the responsibility to oversee the operation of urban public transport in order to better channel transport funding into public transport. Before, the Ministry of Housing and Urban-Rural Development (MoHURD) had been in charge of public transport operations as part of urban planning, but only few funding sources under MoHURD could be directed to transport operations. China's 12th Five-Year-Plan (2010–2015) also gives priority to the development of urban public transport and strives for a more sustainable urban transport development. It sets goals for increasing the modal share of public transport, promotes urban rail and bus rapid transit systems (BRT), promotes non-motorised transport, and calls for an increase of transport system efficiency. A new policy encouraging cycling was released in September 2012.

There have been several projects oriented to improve urban public transport in China over the past 20 years, such as a substantial construction of metros in the larger cities.

Nonetheless, they still appear underdeveloped compared to the road system. While some cities have demonstrated their commitment to public transit by expanding their urban rail and bus networks, China's transport investment policies at large are still more inclined to facilitate smooth access of automobiles rather than to develop public transit and non-motorised facilities. Furthermore, due to the car-oriented urban expansion, non-motorised transport infrastructure like pedestrian sidewalks or bicycle lanes have often been jeopardised by road expansion programmes for automobile use; existing bicycle lanes are often blocked by parked cars.

Considering the financing aspects for sustainable urban transport systems participants in the expert workshop on *Prospects for National-Level Programmes and Funds for Sustainable Urban Transport in China* (1–3 November 2012) identified barriers in four main areas: 1) institutional framework, 2) financial framework, 3) planning framework and 4) capacity at the local level.

Institutional barriers

Institutional complexity and lack of coordination were identified as core hindrances to effective planning, design,

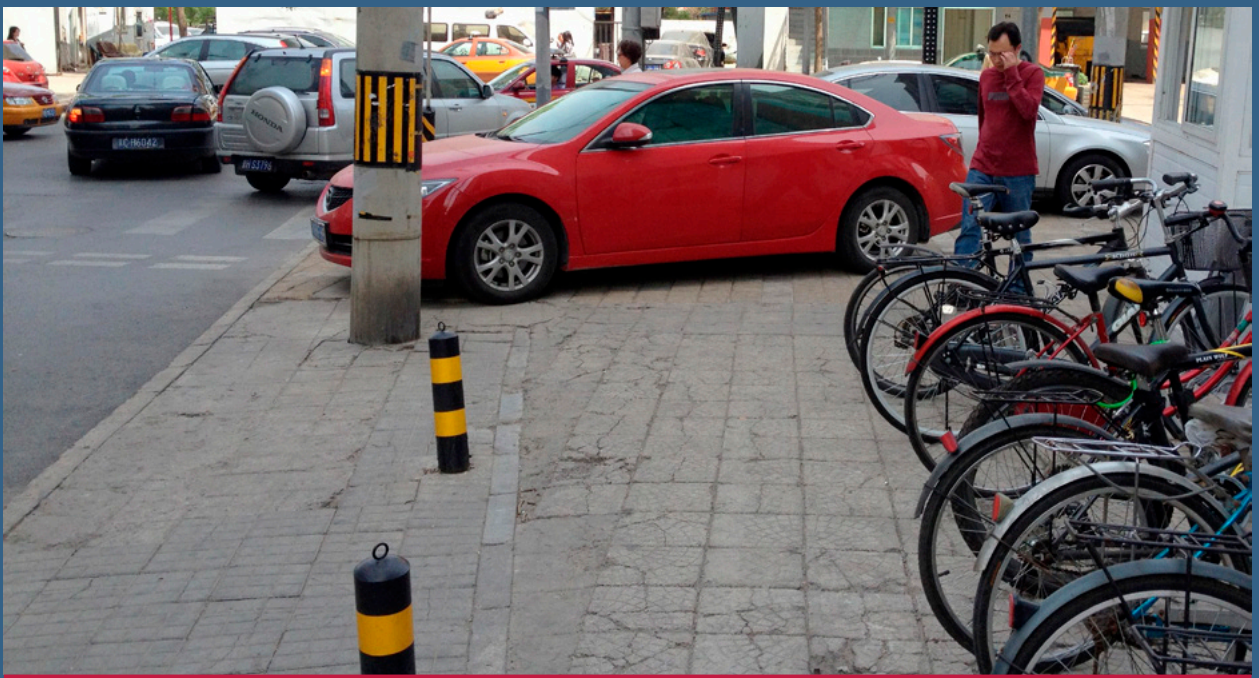


Fig. 2: Illegal parking on a sidewalk in Beijing.
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construction and maintenance of sustainable urban transport systems. At the moment, various ministries are guiding the different aspects of urban transport developments and implementation (see above). These split responsibilities are mirrored at the city level, leaving (most) local transport bureaus with little influence over major elements of a sustainable urban transport system, such as metro construction. Exceptions to this are those cities which have adopted a structure where the urban transport bureau has stronger coordinative powers, as in the case of Shenzhen, where the mandate of the transport bureau has already been expanded. More cities are beginning to adopt the Shenzhen model, but effectively integrating traffic operations and management functions with urban transport planning functions remains a challenge.

Participants identified creating a strong single authority for overseeing all SUT-related issues and improving both inter- and intra-departmental coordination as main areas for improvement:^[1]

Financial barriers

Currently there is no dedicated national fund to support urban public transport and non-motorised transport development in Chinese cities. Even though there are discussions to include public transport as part of the basic public service system, where the funds would come from still remains unresolved (the dedicated budget would also have to include operation costs, not just capital investments). At present, fuel consumption and vehicle purchase tax revenues, which are currently the main revenue source in transport are generally earmarked for highway construction, not for public transport.

Overall, central government tax transfers make up about 20–25% of local revenue, which is managed by different local government departments. So far, cities heavily rely on land concessions to generate revenue for local investments, including public transport. This has created an inconsistent system in which public transport developments are financed through an unsustainable source of income which at the same time fosters urban sprawl. Local public sector budgets are frequently topped up by credits from commercial banks that are channelled through special investment vehicles (so-called urban construction investment companies). This set up has led to significant debt accumulation in cities, and as China does not impose property taxes there

is no mechanism to capture increased land values resulting from transport improvements.

Public transport operations in most cities are constrained by highly subsidised ticket prices. Cities are faced with great uncertainty about how to cover the operation and maintenance costs of their growing public transport infrastructures and services. Furthermore, robust mechanisms to permit or encourage private/market provision of public transport services are lacking in China, despite that such services exist without proper regulation as in the case of unlicensed shuttles and taxis. Therefore, it is important that new sources of revenue are identified and tapped or that more money is directed away from highway construction to public transport developments.

Participants further identified the following areas for improvement:

- Linking funding and performance evaluation, which is missing at present;
- Analysis of alternatives for development of transport infrastructure and services;
- Multi-year budgeting, rather than the current *ad-hoc* project budgeting practice.

Planning framework

Participants discussed the lack of a strategic planning framework, covering the functional (as opposed to an administrative) urban area, which would strategically direct funding into sustainable transport. Although transport planning is a mandatory element of city master planning in China since 2009, there is little cooperation between different departments and currently no instrument to direct funding from urban development to sustainable transport. Consequently, the need to build a stronger link between transport projects and urban development policies was seen to be a key barrier.

Furthermore, current transport planning over-emphasizes the physical features of urban transport networks (network density, per capita area of road, etc.) and lacks a user perspective and a careful assessment of the aggregate impacts on urban mobility and congestion. Under these circumstances, transport impact evaluation becomes a mere formality under the pressure of commercial development. The lack of a strategic planning framework is closely linked with the split of responsibilities in the administrative system for transport. One cannot be resolved without tackling the other.

^[1] Details of proposals of areas of improvement can be found in the workshop report mentioned above (see box on page 1).

Participants identified the following areas for improvement:

- Requiring projects to be part of master plans to be eligible;
- Mandatory mobility plans that fulfil certain criteria;
- Linking transport planning more closely to urban development.

Capacity at the local level

Last but by no means least participants identified limited capacity at the local level as a barrier to effective realisation of sustainable urban transport systems, both in terms of knowledge, as well as in terms of overall manpower. This is especially critical in less developed and smaller cities. A few major Chinese cities, such as Beijing, Shanghai, Shenzhen

or Guangzhou and some provincial capitals have relatively strong institutional capacity already, but they remain an exception. In most cities transport departments lack the resources to measure performance and evaluate cost accounting of transit companies. Furthermore, a strong need exists to improve local data availability and quality to facilitate performance measuring and to develop transparency to hold agencies and officials accountable. Improved data can enable performance-based expenditure of public funds and improve transport planning.

As an area of improvement, participants encouraged the enhancement of programmes to increase the technical capacity at the local level.

increased sustainable transport investment, as well as continued funding for its operation and maintenance. In such a scenario, four questions arise regarding the development of a national urban transport policy:

- What is the most adequate institutional arrangement in order to carry out a national policy of sustainable urban transport?
- What can the national government do to establish a financing framework to ensure a more sustainable development of transport in Chinese cities?
- What are suitable procedures and criteria for national-level funding of urban transport (construction, maintenance and operation)?
- How to develop technical capacities in transport and urban planning at the local level, considering that millions of people will move into cities that may not yet be (fully) built?

To address these questions a workshop was held in November 2012, bringing together international experts with a background in transport finance and Chinese transport experts. The results of this workshop are summarised in a report called *Prospects for National-Level Programmes and Funds for Sustainable Urban Transport in China*^[3]. During the workshop main challenges in financing sustainable urban transport in China were identified and are briefly summarised in the box on page 3.

^[3] <http://sustainabletransport.org/final-workshop-summary-report-on-financing-sustainable-urban-transport>

2 Approach to the analysis of national frameworks in countries

This study presents a comparative analysis of programmes for financing and planning SUT systems at the national level in eight selected countries: Brazil, Colombia, France, Germany, India, Mexico, the United Kingdom and the United States^[4].

Most countries assign planning and development of urban public transport and non-motorised mobility systems to local governments. Nevertheless, many countries implement financing instruments or regulatory frameworks set at the national level to support cities in improving the mobility of the urban population. These countries recognise the positive economic, social and

environmental impacts of such support, which ultimately benefits the whole society and the national economy. In addition, a substantial share of national travel, measured in terms of trips or distances, occurs within cities thus raising the importance of national involvement or oversight of urban transport decision-making.

Cities are fundamental for the national economy: 50% of the world's population lives in urban areas. By 2050 this figure is expected to increase to 80%. Half of global GDP in 2007 came from 380 cities in developed-regions, with more than 20% of global GDP coming from 190 North American cities alone. The 220 largest cities in developing-regions contributed another 10% (McKinsey Global Institute, 2011). In the near future it is expected that megacities in the developing world – especially in China and India – will significantly increase their share in the global economy. Mobility is a prerequisite for these urban areas to thrive as economic centres.

^[4] Further information on the country reviews, as well as references and data sources can be found in the fact sheets for each of the analysed countries. The country fact sheets are available online at <http://climatepolicy.cn/en/downloads/9> under 1-Nov-2012 Workshop on Financing Sustainable Urban Transport.

Table 1: Key statistics

	Brazil	Colombia	France	Germany	India	Mexico	UK	US	China
Population (million)	197 ¹	47 ⁴	63 ⁶	82 ⁸	1 241 ¹⁰	112 ¹²	56 ¹⁴	314 ¹⁵	1 344 ¹⁷
Share of population living in urban areas (%)	85 ²	76 ²	86 ²	74 ²	32 ²	78 ²	80 ²	83 ²	52 ²
Gross domestic product per capita (current USD)	11 340 ²	7 076 ²	39 772 ²	41 514 ²	1 489 ²	9 742 ²	38 514 ²	49 965 ²	6 091 ²
Vehicle ownership per 1 000 residents	210 ³	71 ⁵	598 ⁷	510 ⁹	100 ¹¹	232 ¹³	470 ⁵	797 ¹⁶	58 ¹⁶
Administrative structure	Federal	Unitary Republic	Unitary Republic	Federal	Federal	Federal	Constitutional monarchy and parliamentary system	Federal	Unitary Republic

Sources

¹ IBGE, 2012, ² World Bank, World Database 2012, ³ DENATRAN, 2012, ⁴ DANE, 2010, ⁵ World Bank, 2009, ⁶ INSEE, 2010, ⁷ World Bank, 2010, ⁸ Statistisches Bundesamt, 2010, ⁹ Umweltbundesamt, 2010, ¹⁰ Trading Economics, 2012, ¹¹ Ministry of Road Transport & Highways, 2011, ¹² INEGI, 2010, ¹³ CTS – the World Bank, 2013, ¹⁴ Census 2011, ¹⁵ U.S. Census Bureau, 2012, ¹⁶ The World Bank, 2010, ¹⁷ Census 2012

National governments therefore have good reasons to support the development of urban mobility, but not only for economic motives. National governments can play a guiding role to direct and support cities in developing sustainable urban transport systems. This in turn aids the achievement of country objectives, such as energy savings, the reduction of greenhouse gas emissions or the provision of access to mobility services for all, to name but a few. All eight countries analysed in this paper have implemented funding policies, programmes or regulatory frameworks at the national level. However, they show significant differences in the way national policies – and central governments – address urban mobility as a national issue. This allows a fairly comprehensive picture of urban transport financing programme types and contexts (Table 1).

The analysis is based on the challenges that were identified for the Chinese situation during the expert workshop held in November 2012 (see the box on page 3):

- Institutional framework
- Financial framework
- Planning framework
- Capacity at the local level

These four categories are rather universal and therefore also applicable to countries other than China, making this analysis useful for an international audience as well.

Different types of financing required for SUT

1 Capital investments

Capital is required for transport infrastructure which includes items such as metro and light rail lines, dedicated bus routes, stations and stops, garages/depots, traffic management, fare collection and passenger information systems. These usually are owned by the local administrations. Buses and rolling stock are usually part of capital expenditures but they may be on the books of the operating entity which may or may not be public. These may be provided for by a variety of different sources, financial mechanisms and instruments (loans, grants, concessions, government guarantees, Tax Incremental Financing (TIF), Land Value Capture (LVC), bonds and so on).

2 Operations

Financing the operations of the system include the daily running costs, administration, staff salaries and fuel. How this is paid for widely varies but part of it comes from farebox recovery (the money that passengers pay when they use the services). Farebox recovery ratios vary widely. Most transit systems in the United States have farebox recovery ratios between 25 and 35%. BART in the San Francisco Bay area is an example of a relatively high farebox recovery at

almost 66%, while an entity such as the Central Oklahoma Parking and Transportation Authority of Oklahoma City comes in with less than an 11% farebox recovery. European systems also vary with cities such as Munich covering around 80% of operating costs and many French systems nearer 35%. However it should also be noted that it is not easy to untangle the different funding streams as all concessional fares (reduced fares for the over 65s, School children, disabled or other disadvantaged groups) are usually paid for by the local authority. In parts of Asia and Latin America operations are fully covered by the fare box but this requires very high levels of ridership and sometimes can only be achieved by compromising service quality and comfort levels. The setting of fares is a very sensitive issue everywhere and it is sometimes highly politicised. This often means that operators need to be supported financially as they are not in a position to set a commercial level for the fares or given the opportunity to increase revenues from other indirect sources (as is the case in Hong Kong and the MTR's Rail/Property model).

The gap between the farebox (or commercial) revenues and the operational costs need to be found and it is here that local authorities often need to step in.

2.1 Overview of the approaches to planning and financing SUT in the eight selected countries

As mentioned above, the eight analysed countries^[5] have developed specific programmes and regulatory frameworks for SUT at the national level. Countries were selected to represent different practices and backgrounds. India and Brazil have joined China under the BRICS^[6], and also face rapid urbanisation and motorisation rates. Colombia and Mexico are relevant examples of medium income developing countries with limited resources to fund SUT operations and development, especially at the local level. In both cases their policies

have included participation of the private sector as a means to reduce the budgetary burden and benefit from efficient management practices. The United States was selected due to its size and economic position, as well as its experience with urban transport and mobility financing arrangements. Finally, Europe has many examples of cities that have effectively addressed the challenges of urban mobility including the cases of Germany, France and the United Kingdom that provide useful experiences regarding the different institutional, legal and financial frameworks available for SUT planning and development in such advanced contexts. In these countries, a big portion of SUT financing today is related to maintenance costs, whereas in developing and emerging countries most efforts are currently focused on the development of new infrastructure. But here, too, operation and maintenance costs are already emerging as an additional challenge. The operation alone of the Beijing metro, for instance, cost the city of Beijing CNY 3.69 billion (USD 500 million) in subsidies in 2012 (Beijing News, 2013).

^[5] Please find all references of the following country reviews summarised in the Bibliography.

^[6] India and Brazil, along with Russia and China, and South Africa, have been grouped under the BRICS acronym to jointly advance an agenda as large rapidly growing economies, see <http://www.bricsforum.org/sample-page>.

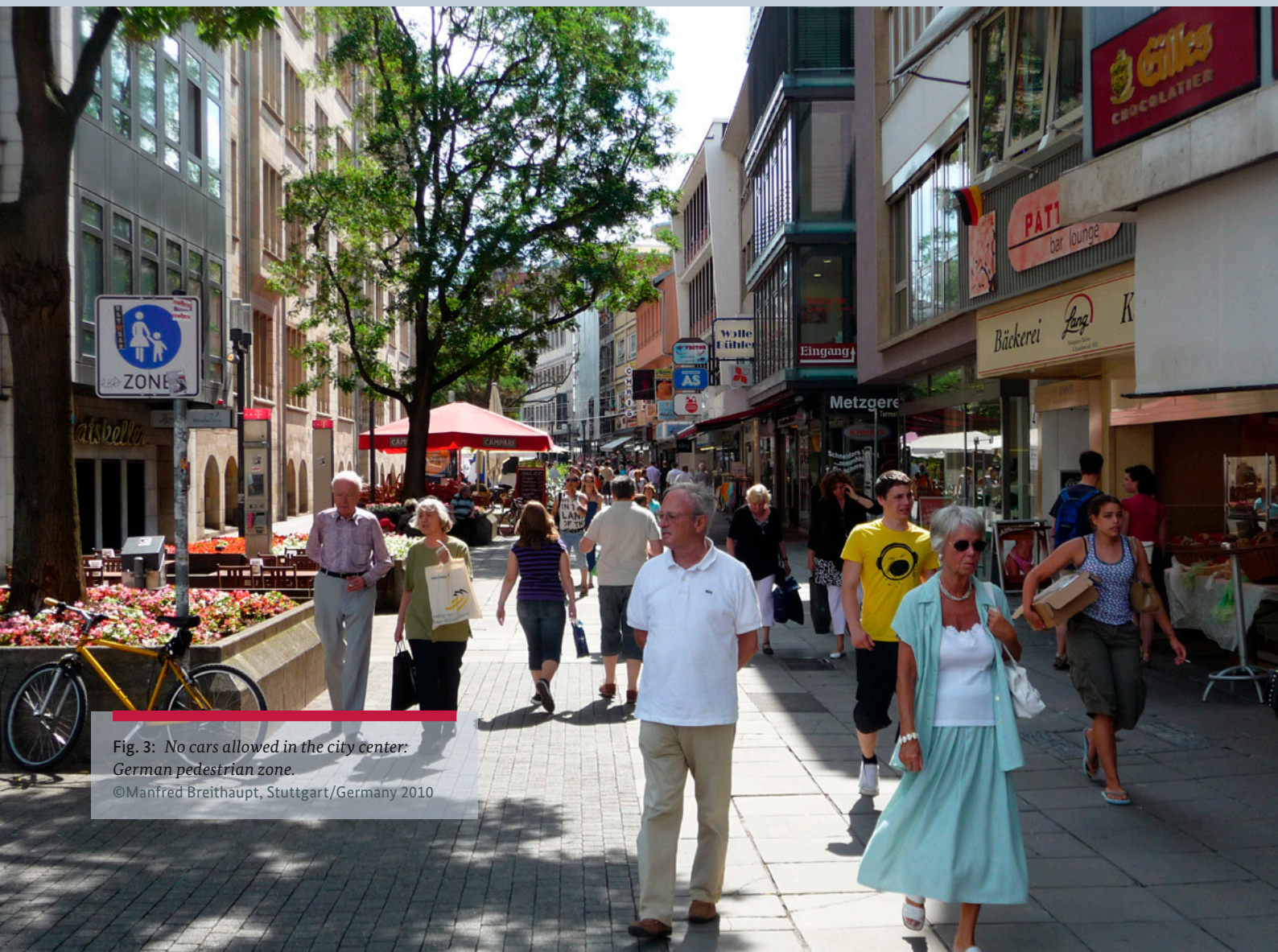


Fig. 3: No cars allowed in the city center: German pedestrian zone.

©Manfred Breithaupt, Stuttgart/Germany 2010

2.2 Brazil

Brazil's National Policy on Urban Mobility requires every city with more than 20 000 inhabitants (1 600 cities) to



Fig. 4: BRT corridor built from local government budget as part of Rio's BRT network.

©Mariana Gil, Rio de Janeiro/Brazil

develop a mobility master plan within three years, linked to its urban development plans (Ministerio das Cidades, 2004). However there is no direct link between federal policy and what states and cities plan and implement, and no direct financing mechanism providing priority to sustainable urban transport developments.

Infrastructure funding comes from the Growth Acceleration Programme – Mobility in Large Cities. It is administered by the Ministry of Cities and funds mass transit projects, including BRT, LRT and metro in large cities. The maximum national funding share is 95%, with a minimum local participation of 5% (Hidalgo *et al.*, 2012).

Buses and operation are funded by the Brazilian Development Bank's (BNDES) Investment Maintenance Programme (BNDES PSI) – Capital Goods. This funding is to stimulate the production and acquisition of buses for urban fleets in any city of Brazil. These funds are loans, equalling 50% of the total value of the equipment for microenterprises, and up to 30% of the value for small or medium enterprises. These loans are given directly to local governments (BNDES-PSI, 2012).



Fig. 5: Bus of the Rio de Janeiro BRT System.

©Mariana Gil, Rio de Janeiro/Brazil

2.3 Colombia

In Colombia, the improvement of urban public transport systems has become a key work area for national and local governments, especially since 2000 with the development of the BRT system in Bogotá (TransMilenio). Although non-motorised transport has not been promoted very much at the national level, it has been the case for local policies within some cities.

Policy considerations within Colombia reflect the National government's intent of transforming public transport provision, traditionally characterised by loosely regulated local transport services operated by thousands of individual private suppliers. The National government provides funding to cities conditioned on the replacement of the semiformal services into integrated transport systems. These systems are to be operated by larger scale private companies (mainly formed

by the incumbent operators) under long term concession contracts with strong supervision. In addition, the transit investments need to be coordinated with the local urban development plans. The instrument to achieve this is the National Urban and Mass Transit Policy (CONPES, 2010).

Funding for infrastructure is available from the Ministry of Transport via the Urban Transport National Programme aimed at developing Integrated Mass Transit Systems (IMTS), consisting of bus rapid transit (BRT), corridors and feeder routes. In addition to infrastructure development, the programme also aims at strengthening institutional capacity. Specific objectives are defined for cities depending on their sizes. Currently, there is no national funding for operation and maintenance of SUT systems (Hidalgo *et al.*, 2012). Other policies on housing and urban services complement the national support to cities.



Fig. 6: Integration of transport systems in accordance with local urban development plans is a key point of Colombian policies. A BRT system in Pereira, Colombia, offers fast boarding.

©Carlos Felipe Pardo, Pereira/Colombia 2007

2.4 France

In France, local transport network management is a subnational prerogative whereas national transport networks are managed and largely financed by private operators (highways) or state-owned corporations (national rail networks). The National Transport Master plan is currently under revision, with the main development axes being improvement of transit quality, efficiency and sustainability, intermodality with freight and private vehicle use reduction while fostering non-motorised modes.

One of the principal tools used to finance urban transport in France is the *Versement Transport*, or employers' transport tax. Set up in 1971, this transport tax is paid by all companies with more than 9 employees in cities with at least 10 000 inhabitants. It is collected to finance a large part of the budget of Urban Transport Organisation Authorities (*Autorités Organisatrices de Transports Urbains* or *AOTU* in French) and ranges between 0.5% and 2% of the payroll of the companies depending on the region and the nature of the public transport network. Employers must also reimburse 50% of the cost of monthly public transport passes for their employees, which helps to ensure dependable farebox revenues for operators. Both the "Versement Transport" and the

employer public transport pass reimbursement obligation explicitly frame a "beneficiary pays" approach to public transport finance that recognises that employers benefit from the efficient access to a wide labour market that high-quality public transport networks provide. Additionally, in 2009 the central government enacted a law named *Grenelle Act* that sets ambitious goals in many areas that affect the environment, which includes urban transport. In this context, the government launched calls for projects to support the implementation of high-level of service sustainable urban transport projects (rail-based or bus rapid transit projects), with the central government planning to invest up to EUR 2.5 billion in the programme until 2020 (CGDD, 2012). The *Grenelle II* law passed in 2010 also establishes a mechanism for value capture taxation in favour of public transport development.

Funding for operation is available from local governments at the regional level for trains, at the department level for intra-departmental buses and at the city level for urban transport. Hence, there is little central state participation in the financing of operations (the exception being some funding for school bus networks and compensation payments for "social" fares offered to the unemployed or low-income households).



Fig. 7: Pedestrians, cyclists and cafés in the city centre.
©Broaddus, Toulouse/France 2007



Fig. 8: The Federal Republic of Germany gives full responsibility for local transport to its federal states. Here: a digital display board for bus arrivals in front of the Museum Island in Berlin.

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2.5 Germany

Germany is a federal country with powerful state governments and administrations. The federal government (*Bund*) and the 16 federal states (*Länder*) share responsibilities in many sectors, including transport. The organisation of public transport and related responsibilities vary between the states, which have differing institutional structures and stakeholders. Usually the municipalities play an important role, as they are directly responsible for all matters of the local communities. Finally, regulations set by the European Union also need to be considered. For historical reasons, public rail transport (*Allgemeines Eisenbahngesetz*, AEG) and public road transport (*Personenbeförderungsgesetz*, PBefG) are regulated in separate laws. As a result of this constellation, the German public transport system and its financing is rather complex.

In Germany, the local level includes two tiers: municipalities (about 11 000) and regions (almost 300). Both develop their broader strategic land use plans (*Flächennutzungsplan*, FNP) and site specific binding land use plans (*Bebauungsplan*, B-Plan) almost independently of each other. In addition, most municipalities set up integrated transport development plans (*Verkehrsentwicklungsplan*, VEP), and most

regions prepare local public transport plans (*Nahverkehrsplan*, NVP). Against this backdrop, it is crucial to align these different plans, which often proves to be rather difficult. Larger cities address this challenge by integrating transport and urban development departments into one single authority. Nevertheless, the administrative boundaries of many cities are too small to handle planning effectively, so that urban functions are split between neighbouring cities (city clusters), requiring a joint planning approach across administrative boundaries. As a consequence, German cities established various approaches to form so-called functional urban areas. They differ in their legal capacity and range from round tables to formal public transport associations. By now public transport associations exist in most parts of Germany; they are particularly important in large metropolitan areas.

Regarding urban and regional planning, the federal government in accordance with the states, which are constitutionally responsible for the implementation of urban and regional planning – formulates guiding principles, which are supposed to be effective through virtue of persuasiveness rather than legal power. The states are also responsible for mass transit projects (except for long distance railway tracks). Many states,

however, delegate this responsibility to their district governments and municipalities, especially for urban mass transit interventions. Several legal requirements in the planning process of infrastructure projects ensure that projects achieve the desired quality. These requirements cover the involvement of relevant stakeholders and the public, Environmental Impact Assessments (EIA) and Cost-Benefit-Analyses.

The established level of German public transport services can only partly be covered by passenger fares. Federal government, federal states and local districts and municipalities contribute a large share of the needed funds.

Just as the separated legislation for rail and road transport, the financial framework for public transport also differs between rail and road. Since 1996 (so-called Regionalisation), local and regional rail bound public transport is under the general authority of the 16 states. The federal government contributes a fixed amount of EUR 7.2 billion (USD 9.3 billion) to the state budgets. The largest share is used for rail transport subsidies and is meant to increase by 1.5% per year to compensate for inflation. The states follow their responsibility through their ministries, state-owned railway companies or agencies (*Landesgesellschaften* in German), or they delegate it further to public transport associations of local authorities. The transport services are regularly tendered or directly awarded for periods of 5–10 years.

Similarly, local and regional road-bound public transport is under the general authority of the 16 states. With the exception of the three city states the responsibility is transferred by federal state law to the urban/rural districts. The districts and cities often form joint associations for fulfilling this task. Although many cities like Frankfurt tender bus services today, public road transport is still in transition from its former situation of a “closed market” of state-owned operators to a tendering system of both state-owned and public companies.

Public financing is characterised by a variety of funding methods and responsibilities. Public funds includes subsidies for operation, grants for reduced fares or free transport for disabled people, pupils, apprentices and students as well as investment grants. Furthermore, public transport profits from a reduced value added tax (7% instead of 19%). The federal states also receive funds from the federal government for investments in local transport infrastructure to achieve public transport improvements. In addition, the federal government provides investment funds for public transport

improvements (both road and rail) that require an investment of more than EUR 50 million (USD 65 million) based on its Municipal Transport Financing Law (*Gemeindeverkehrsfinanzierungsgesetz*, GVFG). The funding for the GVFG has been raised through a dedicated levy on part of the national excise duty on fuel. The national contribution can be up to 60%. This is often required to be topped-up by state governments. The GVFG has facilitated a strong public transport development in German cities over the past decades. In some cases, however, it has also led to oversized and expensive urban rail projects that have left a legacy of high-maintenance costs. This could have been avoided by setting clear minimum requirements in terms of city size or passenger volume to be eligible for funding for urban rail.

The financing system in Germany is complex but effectively balances investments, operational subsidies and high quality planning processes. There is no single national fund but a system of various sources that guarantee citizens the best and most cost effective service. Provincial governments play a key role in the coordination and distribution of funds. Hence, coordinating bodies, such as public transport associations or integrated authorities have the opportunity to create high quality public transport services. Since the mid-1990s, the share of public transport has been continuously increasing in Germany, which underlines the success of the approaches.

Competition in public transport

European Legislation requires that competent authorities establish the discharge of public service obligations and its compensation in the framework of a public service contract. Under certain conditions, Regulation (EC) 1370/2007 allows to directly award the contract, but normally a tendering process is required for those contracts. The German passenger transport law was amended according to those requirements. Self-financing or commercially viable services do not have to be tendered, but if more than one operator is interested in the service provision, they have to compete for the concession. The regulatory authority has to approve the application for a concession to the bidder who offers the best service. A tendering process is required in most states if a direct subsidy is paid to the service provider.

2.6 India

Transit plan development and execution in India is mostly in the hands of state governments; only two states (Maharashtra and Gujarat) have delegated this responsibility to the cities. States present their plans to the Ministry of Urban Development (MoUD) for some of the projects which get funding support under the Jawaharlal Nehru National Urban Renewal Mission (JnNURM). Even in Maharashtra and Gujarat, proposals for funding from the JnNURM have to come through the states and be approved by them first.

India has a National Urban Transport Policy, whose objective is to ensure affordable, quick, comfortable, reliable and sustainable access to citizens in urban areas through transit oriented development and a greater emphasis on non-motorised and public transport. In order to give a boost to public transport, the federal government, through the MoUD, came up with the JnNURM. This programme seeks to correct deficiencies in urban infrastructural services, and provide funding for urban renewal of old city areas to reduce congestion, as well as to provide basic services to low-income populations (Government of India, 2010). Within this scope, there is funding available for BRTs, procurement of rolling stocks (buses), etc. (Hidalgo *et al.*, 2012).

JnNURM involved investment of over USD 20 billion over a seven year period which ended in March 2012. Any urban transport projects considered for funding had to be part of the city's comprehensive mobility plan. Project funding ranged from 35%–90% of total project costs. No funding was available for operation or maintenance (Hidalgo *et al.*, 2012).

Apart from the JnNURM, there are two other channels through which the federal government supports transit investments. One is by way of 50% of the equity in metro projects and the other by way of a Viability Gap Funding Scheme that offers up to 40% of the viability gap for any public-private partnership project from the public budget, half of it from the federal government.



Fig. 9: Corridor of the Indore BRT project funded through JnNURM. ©EMBARQ, India 2013



Fig. 10: Congested streets with cars, motorcycles and pedestrians causes air pollution and frustration. ©Buis, Pune/India 2009



Fig. 11: Urban transportation projects in Mexico are funded largely by the National Works and Public Services Bank. The investment focus is on low-carbon mass transit, such as Bus Rapid Transit Systems. ©Manfred Breithaupt, Mexico City 2009



Fig. 12: BRT State of Mexico, partially financed through POTRAM. ©EMBARQ, Mexico



2.7 Mexico

Despite public transit predominance, service is atomised, unregulated, and of low quality. There is no National Transport Policy, and states and – in a few cases – municipalities are responsible for urban transport policies.

The lack of a specific national policy has been solved with the creation of a financing programme for SUT. Thus, urban transport projects are funded largely by the National Works and Public Services Bank (BANOBRAS in Spanish), through the Federal Infrastructure Fund (FONADIN in Spanish). In order to improve the efficiency of urban transport and to steer it towards a lower-carbon development path, the federal government created the Federal Support Programme for Mass Transit (PROTRAM in Spanish), a FONADIN programme. PROTRAM finances costs of studies and project investment in cities with over half a million inhabitants. Its investment focus is on mass transit, specifically BRTs, LRTs, metros and suburban rail systems (FONADIN, 2012).

PROTRAM receives project proposals from states or municipalities, and covers up to 50% of total costs for studies. BANOBRAS also provides technical and financial support to strengthen local institutions involved in the planning, operation and regulation of urban transport. PROTRAM also provides loans for up to the remaining 50% of the total funding costs. In this case it requires that a private participation of at least 34% of the capital assets, mainly buses and rolling stock (FONADIN, 2012).

Fig. 13: Suburban Train Mexico City financed by PROTRAM. ©EMBARQ, Mexico

2.8 United Kingdom

At the national level, the Department for Transport defines strategic transport policy for the whole United Kingdom, but local transport is defined for England, Wales, Scotland and Northern Ireland separately. The national government sets legal and functional constraints for local authorities and plays a supervisory role, as in the case of England, where it issues national planning guidance, *i.e.* in form of the National Planning Policy Framework (NPPF). The document contains rather general suggestions – one of them referring to the promotion of sustainable transport – which the local authorities are expected to follow.

Regional bodies develop local or regional transport policies, while local authorities implement local transport plans. The Local Transport Plan (LTP) has been introduced in England as statutory transport planning document in 2001. Local authorities are obliged to develop LTPs continuously for periods which used to be as long as five years and which nowadays can be stretched even further. Current plans cover aspects of transport development, transport management and infrastructure maintenance. The plans can be set up collaboratively between neighbouring cities (as a joint LTP).

The government provides funding to local transport authorities in England to help them develop their local transport services and improve and maintain their infrastructure. Most of this funding is for the provision and maintenance of infrastructure such as road improvements, although some funding is provided for on-going services, including buses.

Funding at a national level only accounts for a small part of the global budget of a local transport authority (*e.g.* around 8% in 2011–2012 for Centro, the West Midlands transport authority, and 29% for the TfGM Transport for Greater Manchester the local transport Authority of Greater Manchester). Indeed, the largest part of local transport authority funds come from levies on local councils and other financing tools such as Tax Increment Financing (TIF), in which local authorities borrow funds to deliver infrastructure for development and repay the loan from the increase in local tax revenues generated by the new economic activity (DfT, 2011). A new capital funding mechanism in support of Transport for London's "Crossrail" project imposes an incremental tax on business rates (*e.g.* business taxes based on turnover) under the implicit assumption that London-area businesses are

beneficiaries of high-quality public transport and should therefore contribute directly to its funding.

The funding is a mixture of revenue (for expenditure on recurring items such as running services) and capital (used for acquiring or improving fixed assets such as new infrastructure, stations and depots). A number of funding streams are now distributed through the Department for Communities and Local Government (DCLG).

At the national level, there are eight funds for transport: New Major Schemes, which finances large infrastructure projects (>GBP 5 million or USD 7.5 million); Maintenance, for roads; Integrated Transport Block, for projects under GBP 5 million (USD 7.5 million); and the Local Sustainable Transport Fund, for operations and infrastructure. The total amount available exceeds GBP 1.6 billion (USD 2.4 billion) per year between 2011 and 2015. Projects are awarded via competitive bids from the local authorities. Some funds are linked to wider policy objectives such as the Local Sustainable Transport Fund which is providing GBP 600 million between 2011 and 2015 to 96 local transport projects across England to promote economic growth and cut carbon emissions and a further 95 million has been made available to purchase cleaner buses (Green Bus Fund).

With the exception of London, England deregulated its market for local bus services. Private bus companies now operate most services outside London. Their operation is mainly financed by passenger fares and they are able to apply for the Bus Service Operator Grants, operated by the Department for Transport, which presently provides a grant to some bus and community transport operators to help them recover some of their fuel costs (DfT, 2011). The amount each bus company receives is based on their annual fuel consumption but this will be devolved to the local transport authority and a smaller amount paid directly to operators. In addition, local authorities finance tendered bus services, which are not commercially viable but are considered socially necessary. Concessionary fares, entitling disabled people and those older than 60 years to free bus travel, also play an important role in the UK public transport financing system.

Passenger rail services are run on a franchised basis. Transport Operating Companies bid within a tender for the right to run a specific service. The operating license is granted to the company which offers the highest premium for the Department for Transport or, if applicable, requires the lowest subsidy.



Fig. 14: *Transport is a national matter: The Department for Transport defines transport policy for the whole United Kingdom.*

©Carlos Felipe Pardo, London/UK 2010

2.9 United States of America

The United States do not have a National Policy of Urban Transport. The US Department of Transportation (USDOT) administers national transport policy and funding programmes that are periodically authorised by the Congress. It also administers certain statistical programmes. Public transport programmes are administered by the Federal Transit Administration (FTA), which like the Federal Highway Administration (FHWA) and other modal administrations, operates under the authority of the Secretary of Transportation. The 50 states are also responsible for the funding and development of mass transit programmes, which vary widely in character. However, local governments and regional transport authorities provide the majority of public transport services and operating support, playing a key role also in identifying and executing transit capital projects.

The federal government provides about 20% of total government spending at all levels on transport, with states providing a larger share than local governments. But this funding brings with it federal transport planning requirements which help improve interagency coordination and the integration of transport, land use, and natural resource planning, as well as requiring

public involvement in decision-making, environmental reviews, and various considerations in procurement. A large share of federal funding is distributed to states by formula for highway and public transport programs, although discretionary capital grant programmes make up a significant share of public transport funding at the federal level.

States can also fund their own transit projects, and state funding varies widely. In recent years, most increases in public transit funding support have come at the local level in the form of higher sales taxes approved by voters.

The FTA administers several discretionary programmes for public transport. The New Starts and Small Starts programmes are the federal government's core capital grants initiative for supporting locally-planned, implemented, and operated transit rail and busway capital investments. In fiscal 2013, USD 0.9 billion was appropriated for this programme, which covers up to 80% of total project costs, while state and local governments must participate with at least 20%. In practice, however, the demand for such competitive discretionary grants far exceeds available funds and it is common for state and local governments to contribute half or more of the cost of transit capital projects. Additional 2013 funding

for capital, maintenance, and operating costs are available through the FTA's Urbanised Area Formula Programme (USD 2.3 billion), the State of Good Repair (SOGR) Programme (USD 1 billion), the FTA Metropolitan and Statewide Transportation Planning Programs (USD 0.06 billion), and several programmes dedicated to rural travel (USD 0.3 billion), mobility for the elderly and individuals with disabilities (USD 0.1 billion), and bus and bus facilities (USD 0.2 billion) (FTA, 2013).

All cities are eligible for FTA funding. New Starts projects presented for evaluation must meet certain economic, financial and social criteria. Cities must also demonstrate adequate local support and ability to support operating and maintenance costs. Projects must have evaluated alternative investment projects, and ensure stakeholder participation (FTA, 2009).

The FHWA in 2013 administers USD 38 billion in authorised federal funds, which is allocated largely by formula and some under discretionary programmes. This includes a significant amount of flexible funding that can be used at state or local discretion for highways, public transport, safety programmes, maintenance, planning, pedestrian and bicycle programmes, and initiatives to reduce air pollution related to transport.

The share of US transport projects that include a loan component has been increasing. The Transportation Infrastructure Finance and Innovation Act (TIFIA) Program has provided USD 7.9 billion in credit assistance for 22 projects since 1999, representing USD 29.4 billion in infrastructure investment. Four of the TIFIA projects, or 18% of all TIFIA projects, have been for public transport, and TIFIA has provided USD 1.23 billion in credit assistance for public transport projects, or 16% of the total. (USDOT 2013)



Fig. 15: Bike sharing station in the urban area in Washington, D.C.
©Carlos Felipe Pardo, Washington D.C./USA 2010

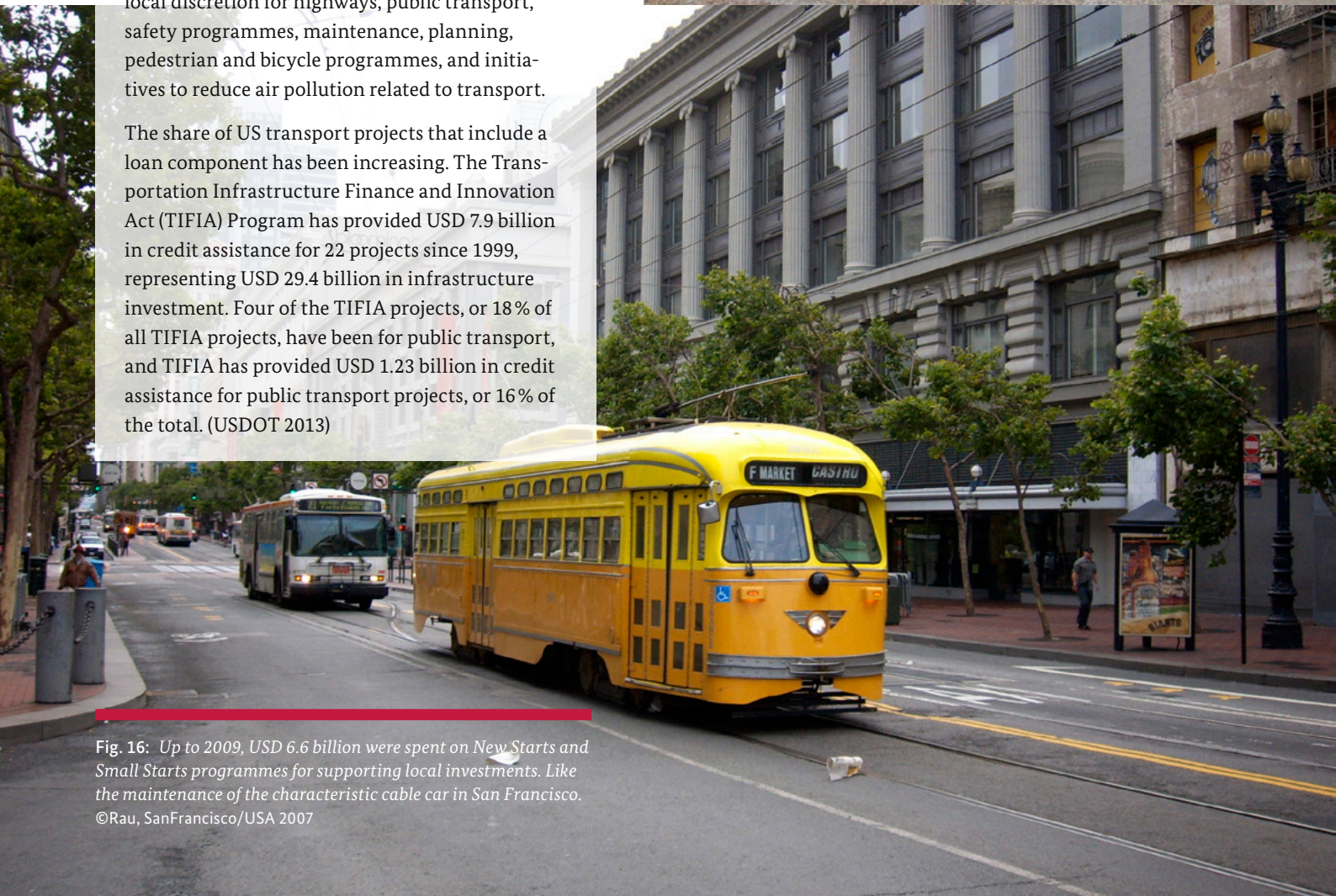


Fig. 16: Up to 2009, USD 6.6 billion were spent on New Starts and Small Starts programmes for supporting local investments. Like the maintenance of the characteristic cable car in San Francisco.
©Rau, San Francisco/USA 2007

3 Models of urban transport financing schemes

The roles and responsibilities of the different government levels related to planning and funding of sustainable urban transport systems define models based on which national public policies affecting this sector are structured. Based on the analysis of financing programmes for SUT in the eight selected countries it is possible to identify two fundamental models:

1. Centralised Financing Programmes (CFP), and
2. Decentralised Financing Policies (DFP).

These two models differ in the arrangements developed for planning and funding of projects. The Centralised Financing Programmes base their philosophy of work in the concentration of planning, evaluation and funding roles in large, powerful institutions linked to the central government, which execute strict control over project development in a generally restricted number of cities. By contrast, in the case of Decentralised Financing Policies full responsibility for planning transport systems lies with local governments. Under this model, the central government's role is limited to the setting of standards for the operation, technical assistance, and above all, project funding through earmarked funds for urban transport. However, the decision on how to use these resources lies with local governments.

Both models are by no means exclusive; they represent an idealised categorisation of schemes that in practice are developed in a more flexible way. In fact, it was found that no policy framework was 100% centralised or decentralised in any of the countries analysed. In this sense, it is common for national urban transport programmes to combine elements of either model according to the local characteristics in a country, characteristics of the interventions to be financed, as well as capacities in the cities where they are to be implemented. Thus, those countries with strong national programmes, such as Brazil, India and Mexico, nevertheless leave much of the responsibilities related to planning and project execution to local governments. Likewise, highly decentralised financing models, such as Germany, France or the United States, rely on national policies and programmes in order to correct the deficient aspects of the decentralised

model, such as a lack of local financial resources and adequate technical capacity in disadvantaged municipalities or regions.

No one model is superior to the other; both offer strengths and weaknesses that must be carefully considered when setting public transport policies. In addition, the design of financing programmes needs to fit the political, cultural and institutional traditions of a country, as well as the degree of capacities at the local level. Thus, the challenge for national governments is not to choose one model over the other, but to know how to best combine the different elements that these approaches offer, according to national and local needs. In this sense, the physical, economic, social and even historical and cultural characteristics of each country's urban development will determine the design best suited to meet the transport needs of their cities. Following this logic, the available human and financial resources



Fig. 17: Convenient boarding in India: Passengers getting on and off a bus at a Bus Rapid Transit stop.

©Kodukula, Pune/India 2008

strongly determine the relevance and appropriateness of each model. Centralised Financing Programmes are usually suited to capital intensive projects and are often employed by developing nations that have the need to develop big infrastructure projects and at the same time lack qualified technical capacity and strong, coordinated and efficient sub-national institutions. Such a centralised approach has shown to stimulate action at the local level to address local transport issues and to plan and make improvements to public transport. On the other hand, Decentralised Financing Policies are adopted in many developed countries endowed with autonomous local governments that operate with highly qualified consolidated technical teams. Nevertheless, as pointed out above, the choice between a centralised or decentralised approach does not only depend on available technical and financial resources, but also on the prevailing administrative structures and the governance history of a country.

The fact that elements of both models are not exclusive allows their coexistence within the same country. Thus, it is possible that national centralised programmes are adopted to provide funding and assistance only to those cities or regions with fewer technical and economic resources or only to cities deemed to be of particular national importance. In parallel, that same country can adopt a different and more flexible decentralised model to assist those cities with more experience in SUT systems implementation, stable and highly qualified technicians and with proven accountability and efficiency in the management of financial resources. In this sense, it is also possible to successfully migrate from one model to another, in which national centralised programmes evolve to decentralised policies as local experience and technical capacity continuously increases.

3.1 Centralised Funding Programmes

Under the model of Centralised Funding Programmes (CFP), planning and financing rely on central government institutions; in this scheme, the states/regions or cities only have a limited mandate in decisions regarding the concrete design and implementation of projects. It is the national government who identifies the needs, examines alternative solutions and develops the technical projects. In this sense, national programmes tend to provide selected cities with good access to funds, while keeping a high level of technical and financial control over projects. For these reasons, the allocation of resources is usually decided according to national selection criteria.

Nonetheless, in reality political pressures usually play a decisive role in the decision whether a city or project deserves financing and/or technical assistance.

Inter institutional coordination in CFP is done vertically, under a top-down scheme in which national institutions take over the leadership of project management. Local agencies usually participate in their development, but the decision power is reserved for central government's planning and financial institutions.

From the planning point of view, such a model facilitates project alignment to fulfil national objectives (for example providing equitable access or the reduction of energy consumption or greenhouse gas emissions). It is a rather rigid model, which favours the implementation of a limited number of solutions that are usually repeated throughout the country without taking the particular characteristics of cities too much into consideration. In this sense, project evaluation is based on strict compliance of an array of technical requirements set out in detail in the programme operation rules.

As mentioned above, due to the model characteristics, the resources are often focused on few cities, usually the largest in the country, at the expense of the smaller ones whose needs must be addressed by local programmes. This has historically been the case in countries such as France and the UK and it is still common for centralised programmes to establish a minimum size for cities to be eligible to access funding, such as in Mexico and India. This situation promotes the implementation of standard solutions ("one size fits all"), which becomes more refined as they are replicated, but are hardly linked to local integrated urban development plans and processes (*i.e.* metros and BRTs without adequate urban insertion).

With respect to financing, CFP tend to be concentrated on intensive infrastructure construction, although it is possible to find funding lines for operational elements such as the rolling stock, fleet management and fare collection systems. Most current CFP programmes do not fund public transport operations though historically, this has not always been the case (*e.g.* in France). If operations are funded, this is based on local programmes, as in some Brazilian and Mexican cities (Sao Paulo and Mexico City, for instance) which subsidise public transport fares. Although most funding sources overall come from the national budget, this does not obstruct the development of co-financing schemes with local governments and even the private sector, as is the case with PROTRAM in Mexico.

Given its characteristics, the centralised programmes gather highly qualified personnel in national agencies, so the training programmes tend to strengthen this group at the expense of local technical personnel, who commonly learn through practice (learning by doing) and through sporadic training programmes.

Even though none of the analysed countries have a purely centralised system, it is possible to include in this group Brazil, Mexico and India, which despite being federal republics have strong national programmes which comply with the characteristics outlined above (see Table 2 below for a characterisation of the two models).

3.2 Decentralised Financing Policies

For countries characterised by Decentralised Financing Policies (DFP), planning of SUT lies in the hands of local or state level/provincial governmental institutions. They identify the needs, evaluate the different available options, perform technical projects, set performance targets and negotiate service contracts with public transport operators and decide the allocation of financial resources. This way, projects reflect distinct local (city and regional) priorities rather than national objectives.

Under this model the central government's role is focused on setting the broad framework conditions regarding the organisation and planning of public transport service provision and, in some cases, financing through the transfer of earmarked funds whose specific usage is decided by the second and third levels of government according to their priorities. This allows a greater coverage of cities to benefit from national resources. At the same time, it allows project diversification and thereby meeting the specific local requirements. In such scheme inter institutional coordination is largely horizontal; limited to local level stakeholders. In order to ensure the desired quality of projects, decentralised systems often employ procedural requirements. These cover for instance, requirements for public participation,

environmental impact assessments or cost-benefit-analysis (which are often part of national schemes). As a result of these process requirements, planning processes can become more time-consuming, but they guarantee (to a certain extent) the acceptance of the public and the consideration of local circumstances. In addition, greater flexibility in project identification and design also fosters innovation at the local level.

With regard to financing it can be stated that most of the analysed systems highly depend on funding provided by the central government. The decentralised model usually facilitates the diversification of financing schemes by promoting the sourcing of local funds. In addition, required local funding is often generated through parking fees, local gas taxes, congestion charging schemes, etc. that can be considered part of a transport demand management strategy.



Fig. 18: Resident parking permits only: Parking management in Berlin.
©Daniel Bongardt, Berlin/Germany 2013

As the decentralised model relies heavily on the existence of well-trained local professional teams, technical capacity is a key element for the proper functioning of the system. In order to strengthen local capacities, the implementation of capacity building programmes can be part of national transport frameworks, such as in the United States, where there are earmarked funds for this purpose.

Although decentralised to different degrees, this group of analysed countries includes Germany, USA, France and Colombia. The United Kingdom has developed a mix of policies in which decentralised and centralised model elements coexist with strong national programmes. London for example is a regulated market while the rest of the country is deregulated.

Table 2: Main characteristics of centralised vs decentralised models for funding SUT

	Centralised Funding Programmes	Decentralised Funding Policies
Institutional Framework	<ul style="list-style-type: none"> ■ Planning and financing mainly rely on central government. Low involvement of local governments in the decision-making process. ■ Distribution of regulatory responsibilities between local and central government. 	<ul style="list-style-type: none"> ■ Identification, evaluation, planning, design and implementation of projects are given locally. ■ National agencies have little or no participation in the decision-making process of projects. ■ Regulatory responsibilities concentrated at the local level.
Planning Framework	<ul style="list-style-type: none"> ■ Projects focused on the accomplishment of national objectives. ■ Project identification and development by central and local governments. ■ Focus on a limited number of cities, usually the largest ones. ■ National agencies tend to favour one type of project (one size fits all), with limited regard to the characteristics of the cities. ■ Highlight quality criteria to decide the allocation of resources. ■ Compliance with national standards. ■ Weak link between implementation of SUT projects and comprehensive urban development plans. ■ Low involvement of community in the decision-making process. 	<ul style="list-style-type: none"> ■ Projects focused on the accomplishment of regional/metropolitan objectives. ■ Project identification and development exclusively by local agencies. ■ A large number of cities of all size receive funding for the development of SUT projects. ■ High diversity of projects are financed. ■ Balance between qualitative requirements, and planning and development procedures for the evaluation of projects. ■ Compliance with national and local standards. ■ SUT projects highly related to comprehensive urban development plans. ■ High involvement of community in the decision-making process.
Financing Framework	<ul style="list-style-type: none"> ■ Most of funding from central government. Limited responsibility of local governments. ■ Less financial risks for local governments. ■ Financing is usually limited to capital investments in infrastructure. ■ Low flexibility for the use of funds. 	<ul style="list-style-type: none"> ■ Co-financing scheme between local and central government. ■ Wide scope of funding allocation (infrastructure, operation, maintenance, etc.). ■ High flexibility for the use of national funds.
Capacity Building	<ul style="list-style-type: none"> ■ Concentration of knowledge (for a limited local talent context). ■ Training programmes tend to strengthen this advisory group at the expense of local technical personnel. 	<ul style="list-style-type: none"> ■ Local knowledge is empowered in the search for innovative solutions adapted to the local needs. ■ Benefit from programmes at the national and local level to train local public officials.

4 Comparative analysis of approaches

4.1 Institutional framework: roles and responsibilities

Of the eight analysed countries, five have a federal administrative structure (United States, India, Brazil, Mexico and Germany), two are unitary republics (France and Colombia), and one, United Kingdom, is a unitary state governed under a constitutional monarchy and a parliamentary system. Of these countries, India, France, Colombia and Brazil have a national urban transport policy clearly established in a policy document, which sets goals, guidelines and standards for mobility at the national level.

In the case of India, this policy recognises that the greatest responsibility in urban transport rests with the states, but allows national government active participation through technical and financial support in the generation of integrated SUT systems in urban renewal processes led by the Ministry of Urban Development.

This has stimulated a lot of interest at city level in mass transit (BRTs and Metros) which would otherwise not have happened.

In Colombia the project planning, development and oversight is a local government responsibility, with most cities, but Medellín, using private operators for the new mass transit integrated systems^[7]. National government provides technical assistance, funding for planning studies, and co-funding for systems infrastructure – up to 70%.

^[7] Medellín has a very highly qualified public operator of the Metro (operational since 1996), which also operates a BRT corridor and three cable car connections – hilly areas. Metro is expanding its network with a LRT corridor and two additional cable-car lines.



Fig. 19: Graffiti on a boundary wall at "Bunte Bank"
©Klaus Neumann, Dortmund-Hombruch/Germany 2011

Table 3: National funding for infrastructure

	Brazil	Colombia	France*	Germany
Programme or Legislation	Growth Acceleration Programme – Mobility in Large Cities	Urban Transport National Programme	Call for proposal on “Urban Transport” in the context of the Grenelle Act	Municipal Transport Financing Law (GVFG)
Managing Agency	Ministry of Cities	Ministry of Transport	Central government: National Ministry of Ecology, Sustainable Development and Energy	Ministry of Transport, Building and Urban Development
Scope	Mass transit only	Mass transit only. Bus fleet, specialised infrastructure and, fare collection and control systems	Infrastructure projects dedicated to the implementation of high-level of service sustainable urban transport projects (metro, tram, BRTs)	Local roads, tram, railways, interchange stations, modern busses, etc.
Eligible modes	BRT, LRT, Metro, Suburban rail	BRT for Integrated Mass Transit Systems (IMTS); and System integration for Public Transport Strategic Systems (PTSS).	High-level of service sustainable urban transport modes	All modes (except national railways)
Eligibility	Larger cities only	IMTS: cities w/population greater than 600 000 inhabitants; and PTSS: cities w/population between 250 000–600 000 inhabitants.	The National Ministry of Ecology, Sustainable Development and Energy selects the projects (selection process remains unclear)	All cities, provinces/states submit proposals and support cities in preparation of projects
Authorisation	Individual calls for projects	Multiple-year programme	Multiple-year programme	Multiple year, since 1971, current phase running until 2019
Award types	Loans, combinations	Co-financing grants	Grants up to 25% of the cost of the infrastructure project	Grants
Recipients	State and city governments	Local governments (municipalities)	Urban Transport Authorities	Urban transport authorities and public transport operators

* In the case of France, local AOTU (Urban Transport Organisation Authorities) undertake significant infrastructure investments alongside specific operators, independent of the National Government. The investment flows as part of the Grenelle Act are small compared to overall investment flows that are sourced by AOTUs and operators.

Source: Information taken from fact sheets (see <http://climatepolicy.cn/en/downloads/9> under 1-Nov-2012 Workshop on Financing Sustainable Urban Transport) and Ben Owen, Aileen Carrigan and Darío Hidalgo (2012) Evaluate, Enable, Engage. Principles to Support Effective Decision Making in Mass Transit Investment Programs. EMBARQ, USDOT website.

India	Mexico	UK	US
Jawaharlal Nehru Urban Renewal Mission (JnNURM)	Federal Support Programme for Mass Transit (PROTRAM)	1. Local Sustainable Transport Fund 2. Major Schemes Programme	New Starts/Small Starts, Surface Transport Program, CMAQ, SOGR, TIFIA
Ministry of Urban Development (MoUD)	National Bank of Public Works and Services (BANOBRAS)	Department for Transport	Federal Transit Authority, Federal Highway Administration
All types of urban infrastructure	Mass transit only. Infrastructure, control systems, executive projects and fare collection	1. Finances local infrastructure projects (and not inter-urban journeys) 2. Finances local/regional infrastructure projects	Public transport infrastructure & vehicles, maintenance, access facilities, pedestrian, bicycle, safety
BRT, road widening, flyover, etc.	Primarily BRT, LRT, Metro and Suburban Rail systems	No limit on type of measures, except for major rail, passenger transport or road infrastructure enhancements. Cycling infrastructure and programmes can also be supported.	All modes except intercity railways. Varies by specific funding programme.
Large Cities with population over 1 million inhabitants and also special cities like state capital, cities with high inflow tourist – a total of 65 cities	Cities with a population above 500 000	Any English local transport authority outside London	Varies by specific programme All cities with a population above 50 000; states administer capital and operating grants for rural areas.
Multiple – 7 year programme that ended on 31 March 2012	Multiple – year programme	Multiple-year 2011–2015	Funds are available for starting year plus two years (total of three years)
Grants	Grants and loans	Grant (GBP 210m in total between 2011 and 2015)	Grants, loans, or combination of both
Municipal Corporation/ Development Authority (Public agencies)	State and municipal governments	Any English local transport authority outside London	Public bodies and agencies (transit authorities and other state and local public bodies and agencies thereof) including states, municipalities, and other political subdivisions of states.

Brazil has a National Policy on Urban Mobility, which gives priority to non-motorised transport and public transit over private motorised transport. The responsibility for urban transport is, however, in the hands of local governments. National government only provides grants and loans for project development – planned, built and operated locally, either through public (most rail systems) or private operators (bus systems). The funding has increased in preparation of the FIFA World Cup 2014 and the Rio de Janeiro Summer Olympics 2016.

In the case of France, a National Transport Master Plan exists, but it is under revision given the change of governmental majority in 2012, and the impact of the financial crisis has led the current government to revise its priorities. Its main development axes are to improve the access to transport services, improve the quality of passenger transport; to foster intermodality for freight; to reduce the use of individual vehicles; and to promote non-motorised transport and public transport. The national program provides funding for capital investments, but the responsibility for developing and operating transit systems rests at the local level, with the benefit of having a continued source of funding – the payroll tax.

One interesting case is Mexico, which has no explicit national urban transport policy in the National Development Plan – the instrument that sets broad strategies for the national government to follow throughout the six years in office^[8]. In this context, the work of the Minister for Communications and Transport is limited to financing road infrastructure and intercity transport. However, the lack of institutions responsible for national planning is in part solved due to the existence of the Programme for Mass Transport Support (PROTRAM in Spanish), which aims to provide technical and financial support to local governments promoting the creation of SUT systems.

Following a centralised model approach, the Indian and the Mexican programmes are clearly aimed at strengthening the mass transit of large cities, establishing a size requirement of the city to apply for funding. Thus, the JnNURM in India focuses on the main 65 cities in the country, while PROTRAM establishes a minimum urban population of 500 000 inhabitants before a city can access funds for the development of SUT projects (GoI, 2009).

Although not a strict rule, something similar occurs in some countries that have adopted the decentralised model. One good example is Colombia, which has established a comprehensive set of policies divided into three main approaches (CONPES, 2010):

- For cities with a population greater than 600 000 inhabitants: integrated mass transit systems (SITM in Spanish) are developed. They are based on BRT technologies.
- For cities with a population between 600 000 and 250 000 inhabitants: Public Transport Strategic Systems (SETP in Spanish) are developed, based on system integration.
- For cities with a population lesser than 250 000 inhabitants, efforts are placed on public transport re-organisation and the implementation of traffic management measures.

Decentralised Financing Policies usually are more flexible in the allocation of financial resources than the Centralised Programmes. In the American case, the allocation criteria is not based on the population of cities (although only towns with over 50 000 inhabitants are eligible), but on the size and complexity of the projects. Thus, the New Starts Programme was established for large projects, while funding out of the Small Starts Programme is reserved for projects that cost no more than USD 250 million (FTA, 2009).

The most decentralised approach is that of Germany, in which federal states (*Länder*) can decide which projects they select for receiving national funding. For operations – especially that of regional railways – all national funds are transferred to the state level and left at the discretion of state governments. Germany also has been able to incrementally increase fares over a period of time that has helped achieve a high farebox recovery ratio for operators and still kept high public transport use (or relatively high). This has been partly due to the creation of public transport alliances called *Verkehrsverbünde* bringing together cities and towns in a surrounding area to work together and develop local policies and set for example fares between them.

However, and as it was mentioned above, centralised and decentralised models can coexist in the same country. In fact, it is common that national policies make exceptions for large or capital cities (like Paris or London) where strong and highly qualified transport and planning agencies often exist (*Syndicat des transports d'Île-de-France*, STIF, in Paris; Transport for London in the British capital). These agencies often allow such cities to develop

^[8] This may change in the 2013–2019 national development plan, being proposed by the current national administration.

projects and programs with a higher degree of autonomy than the rest of the country.

One of the main challenges faced by public transport policies is the coordination between local governments departments involved in the projects to be financed. In the case of the countries that have adopted the model of Decentralised Financing Policies (United States, Germany, France and some Colombian cities, like Medellín, Bogotá and Pereira), this is addressed through strong metropolitan planning agencies that are able to handle different local interests. A good example is the German public transport alliances (*Verkehrsverbünde*) – a joint entity of participating cities and the provincial level – or the coordinated network of city-level transport organising authorities in region-scale *Syndicats Mixtes de Transport* in France that ensure transport planning coordination. This is not the case in Mexico, India and most of the Brazilian states, where the implementation of transport projects is usually hindered by the lack of coordination mechanisms at the metropolitan level. The high degree of municipalities' autonomy, especially in Mexico, in addition to short office terms of mayors can derail large scale and complex projects that require the

coordination of both state and municipal governments. Something similar occurs in India, where the high level of institutional scattering combined with a lack of technical capacity at the local level combined with many levels of bureaucracy slow down the implementation of projects. The lack of a clear and simple structure for planning translates into delays and excessive administrative procedures which resulted in the JnNURM being only able to transfer a small amount of funds available to finance mass transport projects.

4.2 Financing framework

4.2.1 Infrastructure (Conditions and sources of funding)

The definition of the term “infrastructure” differs in the analysed countries. The United States understands this concept as the construction of the space where confined systems such as BRT, metro or light rail circulate (*fixed guideway*). A similar definition applies in Mexico, where in spite of giving importance to the improvement of the urban environment; PROTRAM only finances the

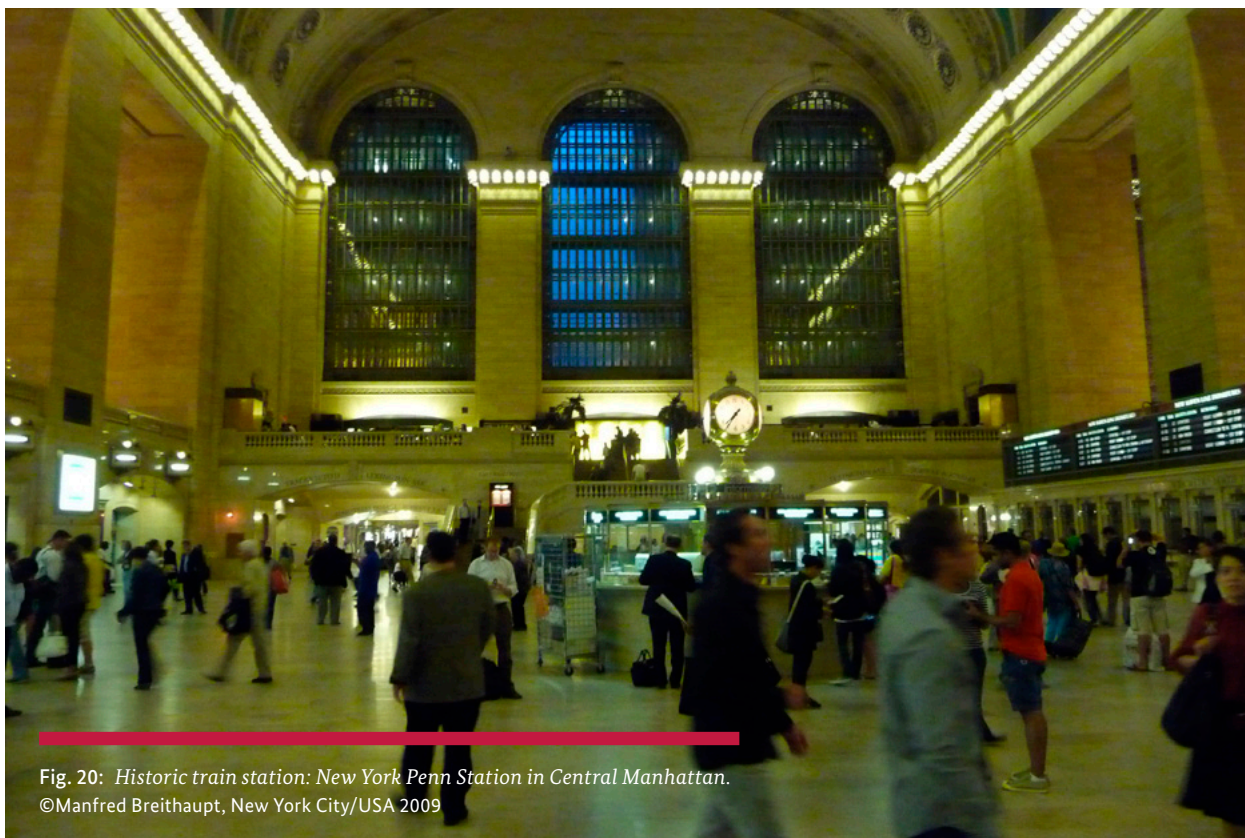


Fig. 20: Historic train station: New York Penn Station in Central Manhattan.
©Manfred Breithaupt, New York City/USA 2009

Table 4: Funding shares

	Brazil	Colombia	France	Germany	India	Mexico	UK	US
Maximum national funding share	95%	40% (min) –70% (max)	20–25% (varies by mode)	60–90%	35–90%	Up to 50%	No maximum national funding share, although local authorities are strongly advised to contribute with own financial resources.	80% but for many large scale public transport projects, match is in principle only 50%.
Minimum private participation	No	10%	No	No	No	34%	No	No
Minimum local governments participation	5%	30%	No	No	No	Not in general, but minimum requirement for planning studies (at least 50%).	No	20% for roads but in principle 50% for major new public transport projects.

construction of circulation spaces of transport systems and the implementation of fleet control and fare collection systems. Colombia also provides public financing for fare collection and control systems. Of the analysed countries, India is the most open to finance all kinds of infrastructure related to public transport; this is based on the urban renewal tool that the Ministry of Urban Development grants to such projects (Hidalgo *et al.*, 2012). In the case of Germany, each state has a fairly wide degree of flexibility in deciding how funds are used, characteristic of Decentralised Financing Programmes.

In most of the analysed national schemes, a model of cost sharing with local governments is established in which the national government's contribution varies according to the characteristics of each project and the economic capacity of the applying local governments (Table 4). A case of particular interest is the New Starts Programme of the United States, which establishes a minimum participation of 20% for local governments in financing the projects. However, and given the high competition for access to such funds, it is common for sponsors to contribute up to 50% of the infrastructure cost (FTA, 2009). A scheme like this uses competition among cities as a tool for greater involvement in the project development and continuous improvement of funding proposals.

However, since highway investments are eligible for 80% funding, this puts public transport proposals at a considerable disadvantage as they require several times more local and state matching funds than highway projects. This model also has the risk of widening the current gap between rich and poor states and municipalities.

In Colombia, funding for transport infrastructure and services also comes in the form of co-funding from the national government and municipalities. The national government co-finances projects with a minimum of 40% and a maximum of 70% of the total costs. There is not a minimum participation required for local governments; however, they must finance the missing share (left after national funding and private participation) through their own resources. Local governments may apply revenues from a municipal gasoline tax to contribute up to 30% of the total project cost (CONPES, 2010).

The adoption of a scheme like PROTRAM in Mexico, where financial responsibilities are divided amongst the national agency, state and municipal governments and private initiatives, has been successful in its goal to foster greater commitment from the local parties involved who become jointly responsible for the success of the initiatives. However, such a model can deter low-income states and municipalities in executing large, complex and

high risk projects, since they require a percentage which is a substantial amount of their finances. Mexico and Colombia are the only countries that consider a mandatory minimum of private participation in the funding share (34% in Mexico, 10% in Colombia). There is also an increased level of risk if there are a lot of interested parties and the city is not experienced in managing such public/private associations.

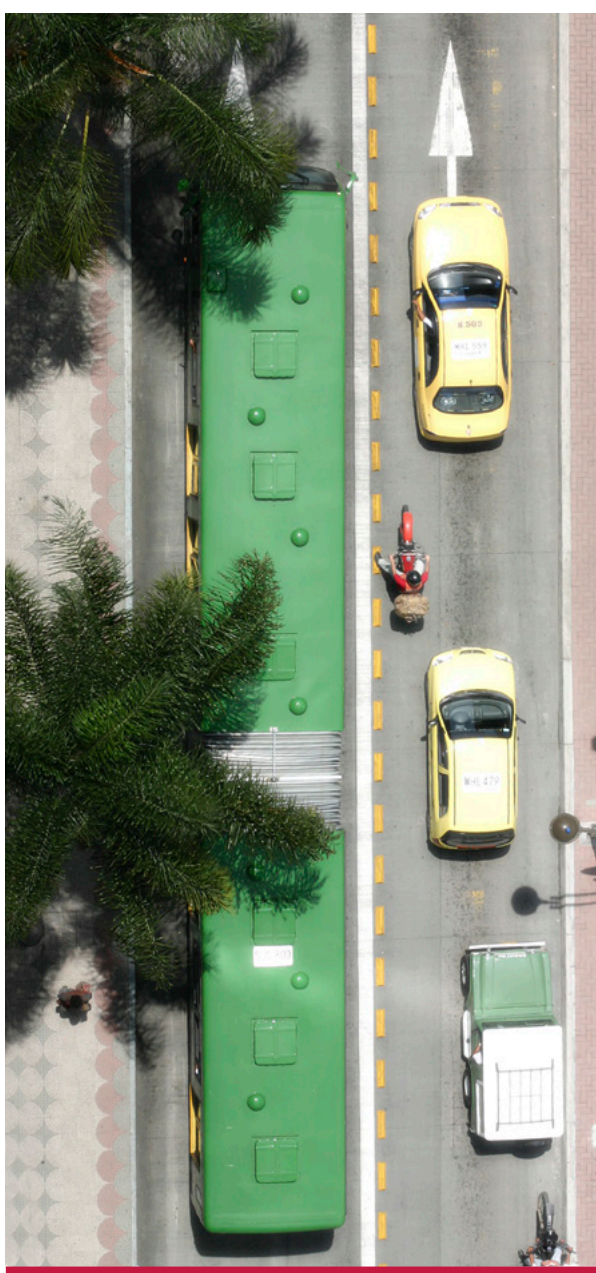


Fig. 21: New dimensions: mega busses with extra length are part of the Colombian BRT system.
©Varano, Pereira/Colombia 2009



Fig. 22: Organising traffic in the inner city: traffic signs in Paris.
©Broaddus, Paris/France 2007

For the local share, municipalities in Colombia directly receive a 25% fuel surcharge (UNDP, 2012). In the case of France, the organising authorities (AOTUs) receive the payroll tax (*Versement Transport*). This tax covers about a third of the regional operational expenditures in the Ile de France (Paris) region. In Brazil, companies pay directly the public transport pass (*Vale Transporte*), to their employees so they do not spend more than 12% of their income in Transport. This has allowed for relative high fares in public transport systems in Brazil as compared with other countries in the region (Hidalgo and Carrigan, 2011).

In general, decentralised models are more flexible to find alternative ways to generate financial resources at the local level. Thus, the development of transport demand management (TDM) programmes, like parking meters or congestion pricing schemes and setting building regulations for the number of parking spaces, which have a positive impact on urban mobility, can also provide a stable source of funding for SUT systems. One of the best examples in the countries studied is the case of London with the congestion charging scheme assigned directly to public transport improvements and operations.

Value capture policies, like land value taxes or development impact fees, can also be used for raising revenues that can be used to finance SUT projects. This can be a way that real estate and property developers can help either pay for or refurbish transit. It was successfully used in London where the public transport access improvements were part of the renovations of a large Football Stadium. In the case of some German cities, revenues from municipal energy suppliers are used to subsidise public transport.

4.2.2 Public transport operations

National programs are mainly focused on supporting capital costs. Some programmes, however, also support operations. Operation costs primarily include fuel and energy costs, units operation and maintenance, maintenance of the fare collection system, the administrative expenses of the management structure, and operational and maintenance staff salaries. Staff costs vary but in the United States and Europe they are often as much as 70% of operating costs.

Funding programmes for the operation of public transport systems are available in several countries that have adopted Decentralised Financing Policies: Germany, United States, and France. In these countries national government has an extensive involvement in public transport service provisions. Also in the case of the UK, where operations are characterised by widespread private sector participation, national funding sources to support transit operations exist.

Funding for transit operations in these countries is based on the principle that government shall ensure efficient operation, accessibility and affordability for all members of society. Funding programmes for operation usually do not discriminate by city size. For example, in the case of the United States, national funds are available for the operation to populations under 200 000 inhabitants through the Urbanised Area Formula Programme. There is also a degree of flexibility and independence for the use of funds. These are not labelled for specific areas, but managed according to the needs of each entity. However, funding for operations is generally intended for fuel and power costs depending on the technology (buses, trolley-buses, trams or trains). The strength of the US programme design is that funding is not necessarily a fixed amount. Federal involvement is subject to system features, but funding for the operation should not exceed 50% of the gross cost of the system operations (FTA, 2009).

In the case of Germany, the states (*Länder*) have full responsibility to distribute national funds of about EUR 7.2 billion (roughly USD 9.3 billion). Funds do not necessarily need to be applied for a given mode of transport; however, most of the money is channelled into regional railways. Most of the states and the sub-ordinated transport alliances tender rail services for a period of about eight years using service contracts with operators. However, the support is also available to finance operations of buses, light rail, subways and others. The distribution of funds between the German *Länder* mainly follows a formula based on the number of registered vehicles in proportion to the total number of registered vehicles in Germany. But it also takes special conditions of the former eastern German states into account. In France, operations for urban transport are financed by regional governments for regional trains, at the Department level for intra-departmental buses and at the city level (Urban Transport Authorities) for urban transport. In the case of United Kingdom, there are a variety of ways that the operators can balance their books partly from the Bus Service Operator Grants operated by the Department for Transport refund and also from concession fares and the different types of contracts (gross, net or quality partnerships). In any event services that are not commercially viable but are socially required (such as to some outlying places) need to be supported in some way.

There are differences in the entity engaged in the administration of funds between these countries. While in the United States funds are awarded directly to states or public entities with the legal authority to receive and administer federal funds, in Germany they are received and administered by administrative units, which are required to provide 80% of the funds to the companies providing the service. In France, Public Transport Operating Authorities centralise funds sourced from the *Versement Transport* for the urban region and from different levels of sub-national governments according to their public transport responsibilities and pass these on to public transport operators according to public service contracts.

The advantage of a financing programme for the operational expenditures is that it reduces the risk of infrastructure investment, because it provides better control over the operation and ensures support over the lifetime of the systems. In addition, funding programmes for operations also assist in the conservation of assets, reducing the risk of expensive overhauls. The support of operations also ensures that systems remain affordable for users even at relatively high levels of service.

In countries that have adopted Centralised Funding Programmes, like Mexico and India, local mechanisms are established, usually through public-private partnerships, to ensure the operation of a transport system without financing programmes for operations. But evidence shows that there is a risk regarding the quality and efficiency of the system. The mix between the financial self-sustainability of a transport system and low ticket fares (politically set, technically unsubstantiated) can lead to carelessness in the operation and maintenance of the system. For example, in the cases of Mexico and Colombia – where transport services are mainly operated by the private sector – the risk is clearly assumed by the users and by states or municipalities; while users experience a gradual decline in the quality of service, states and municipalities see a deteriorating capital investment. Table 5 compares the strengths and weaknesses of each of the two approaches.

4.3 Planning framework

4.3.1 Project identification and development

The identification and development of a project refers to the identification of transport needs at the local level; followed by alternatives analysis and feasibility studies; and finishing with detailed design (technical, financial, legal and institutional).

While in all analysed countries the identification and development of technical projects rests with states and municipalities, they can basically be distinguished into two different approaches: full responsibility of the local authorities versus centralised responsibility. In the first, typical of Decentralised Financing Policies, the departments of transport and urban development of the states and cities or Public Transport Operating Agencies bare the sole responsibility for all phases of the planning of public transport systems (except for those cases where networks span multiple cities or states, like inter urban trains). This is the case in Germany, United States, France, and Colombia. In this model, national programmes are either limited to provide funds to

Table 5: Funding for operation

Approach	Strengths	Weaknesses
States, cities, or regional public transport operating authorities receive support for transport operations (Germany, United Kingdom, France, USA)	<ul style="list-style-type: none"> ■ Assignment of resources by law which eliminates bureaucracy and discretion in funding projects; ■ Reduced investment risk; ■ Funding allows service operation to established standards and affordable rates; ■ Great flexibility in the use of resources. Can be used for different components of the operation. 	<ul style="list-style-type: none"> ■ Flexibility in resource management does not necessarily guarantee the quality, accessibility and frequency of service; ■ The operational and administrative efficiency of the system depends on local capacity to identify and address the different areas that make up a transport system; ■ Risk of subsidising inefficiencies of the systems. No incentive for operators to improve financial efficiency of the systems.
States and cities do not receive support for transport operations (India, Mexico, Colombia, Brazil)	<ul style="list-style-type: none"> ■ Based on the principle of self-financing from fees, seeking to promote efficiency in the operation. 	<ul style="list-style-type: none"> ■ There is a high risk factor in maintaining the quality of service; ■ Countries without support for operations display: <ul style="list-style-type: none"> ➢ A gradual deterioration of public transport systems; ➢ Neglect by private operators regarding maintenance; ➢ Service contracts with private operators where the financial risk is absorbed by the local governments.

local authorities for them to manage according to their own priorities (like in Germany) or they allocate funds according to the characteristics and impact of each project, as is the case in the United States, where cities compete to obtain funding from different financing programmes. This model is attractive for countries in which cities have consolidated and strong technical teams, allowing the development of local projects without incurring lengthy bureaucratic procedures through interference of national government in projects (as happened in India). However, such a scheme hinders projects planned by local governments lacking technical capacity.

In the second approach, the centralised model, adopted by India, Mexico and Brazil, national funding programmes also participate or support the development of technical projects. In the case of India and Mexico this is through the provision of resources to hire expert consultants who work with local governments to identify the best solutions for each city, and to develop the technical projects which are then subject to finance their implementation. In Mexico, this has resulted in a continuous improvement in the quality of financed projects, although development cycles have been much more extended than those considered when creating the programme.

4.3.2 SUT projects and urban development

A key aspect in the identification and development of projects is their relationship with urban development processes and the improvement of the environment in which they operate. This issue is valued – at least theoretically – by both the centralised and the decentralised approaches.

India, Brazil and Mexico offer good examples from the centralised perspective. In the Indian case, this orientation is widely determined by the fact that the funder is the Ministry of Urban Development, which places special emphasis on the integration of SUT systems with urban renewal strategies in the context in which they are inserted.

In Brazil, where urban transport policies are led by the Ministry of Cities, cities with more than 20 000 inhabitants (about 1 600 cities) have to develop a mobility master plan within three years, linked to the city's urban development plans and strategies. The aim is to improve goods and people's accessibility/mobility within cities, whilst integrating different transport modes (Presidencia da República, 2012).

In Mexico, projects must be part of a Comprehensive Plan for Sustainable Urban Mobility (PIMUS in Spanish)

developed by states and municipalities that apply for funding. PIMUS must consider public transport networks with integrated urban development plans and strategies (FONADIN, 2012). However, as of today no policy has been implemented to verify compliance with these plans. Because of the natural infrastructural orientation of the Mexican Programme and the lack of additional funding for the improvement of the environment, in practice projects are implemented without taking into account the existence of integrated urban development and territorial strategies.

From the decentralised perspective, something similar occurs in France, where the elaboration of Comprehensive Mobility Plans (decided at the city or urban community level) is mandatory. These plans must comply with criteria such as the promotion of public transport and non-motorised modes, road safety, car traffic alleviation, management of road networks within urban areas, parking management, company mobility management, etc. (CGDD, 2012). As for the United States, to join the Federal Transportation Authority financing system, projects must be framed into a Metropolitan Transport Plan, and supported by a Metropolitan Planning Organisation composed of local and state representatives as well as transport operators (FTA, 2009).

A different approach within the decentralised model can be seen in Germany, whose model is based on coordination between cities. In this case, the development of Local Public Transport Plans is compulsory in most



Fig. 23: In Brazil, every big city, like Rio de Janeiro, has to develop a mobility master plan within three years.

©Lux, Rio de Janeiro/Brazil 2010

states. Such plans are often conducted for city clusters and coordinated by regional transport associations instead of only one city. In addition, many German Länder (states) also have a planning procedure in order to identify the most beneficial regional projects and to coordinate activities in the field of transport. The UK follows another approach in a deregulated environment outside of London where any operator can propose a route to the local authorities which has led to patchy success and in some places a significant deterioration of the quality of service and the price/quality offer.

4.3.3 Evaluation

All the analysed programmes consider both quantitative and qualitative cost-benefit analyses of the proposals. However, the orientation and the level of accuracy of the evaluation show significant differences between them. On the one hand, Centralised Funding Programmes tend to ensure the quality of projects developing an evaluation model based on selection criteria. On the other hand, Decentralised Financing Programmes tend to consider process requirements as an addition to selection criteria – taking into account both national and local standards – to ensure an appropriate level of quality of projects.

In the case of the United States, the Federal Transportation Authority (FTA) has made a great effort to ensure a clear and objective evaluation format, developing very specific indicators and benchmarks for assessing both the baseline and each of the alternative solutions proposed. This allows a relatively objective assessment of those externalities whose impact cannot be limited to financial terms, such as those of socio-economic, environmental or public health character. In this case, technical assessment of projects is performed by an independent government agency of the New Starts and Small Starts programmes, which can be supported by external consultants on specific issues, especially in identifying potential risks. The complex task of evaluating projects can be reflected in a brief form (fact sheet) delivered to the decision makers of the FTA, which contains the main quantitative and qualitative aspects of cost-effectiveness analysis (Hidalgo *et al.*, 2012). These analyses inform a public participation process, in which the community directly selects the preferred alternative. In many cases the locally preferred alternative is not necessarily the one with the highest cost-effectiveness, but still needs to pass a minimum threshold. The FTA makes a recommendation to Congress after revising the process.

Sometimes the institutions involved in the evaluation process have different orientations and methodologies to assess viability and impacts of SUT projects. That is the case in Mexico, where the Treasury's analysis favours socio-economic assessment of the proposal, emphasizing the social benefits. However, the national development bank's (BANOBRA) evaluation, which occurs afterwards, has a clear financial tendency, seeking to ensure the sustainability of the proposed business model. Much of the confusion this creates is due to the fact that the project evaluation guidelines are based on the analysis of road infrastructure projects, in which the measuring for non-financial externalities, such as environmental or social impact, are not set out clearly.

In Mexico, the analysis of the proposals is carried out by internal PROTRAM consultants (experts in assessing the financial feasibility of an initiative) and other public agencies involved, as outside experts and a local NGO (EMBARQ Mexico), incorporating other variables to the analysis, such as social and environmental impacts as well as urban development processes experienced in the immediate environment. India uses a scheme similar to Mexico: the responsibility of the technical evaluation of the proposals lies with an NGO specialised in transport that works in conjunction with the Central Public Works Department (CPWD), which is a technical area of the Ministry of Urban Development. Although CPWD is a separate entity, it is directly answerable to the Ministry of Urban Development and can be strongly influenced by its representatives. Even more important, decision makers have the authority to overrule the evaluator.

The incorporation of external evaluators in assessing funding programmes is a strategy that has important advantages:

- Allows more transparent technical evaluation of projects, which are less exposed to political pressures that are typical of national agencies.
- Provides technical analysis teams specifically formed according to the characteristics of each project and can count on several experts to evaluate specific aspects of each initiative.

However, it is important to notice that outsourcing these functions should not lead to an impoverishment of technical capacities within national funding programmes. Having strong technical counterparts within national governments translates into a more fluid and fruitful dialogue with both external evaluators as with the technical experts of the cities that develop SUT projects.

Table 6: Project evaluation

	Brazil	Colombia	France	Germany	India	Mexico	UK	US
Separation between evaluators and decision-makers	Yes	Yes	Yes, Administrative evaluation framework for plan compliance (required for approval) delivered by Administrative Tribunal	Depends on each State	No	No	Yes	Funding recommendations and funding approvals separated by branch of government
Technical evaluation	Government agencies	Government agency – Ministry of Transport	Yes (as part of above)	Depends on each State	Institute of Urban Transport (IUT) and Central Public Works Department (CPWD)	National Development Bank (BANOBAS) and external consultants	Technical committees within the Department for Transport	FTA Government Agency
Other public agencies involved in evaluation	Ministry for Cities, Ministry for Planning. At city level, the secretariat of Environment needs to approve the project.	No	Yes	Depends on each State	No	A Consultative Working Group is formed by representatives of federal institutions and by a specialist in infrastructure projects	The national treasury reviews decisions for costlier projects.	No
Involvement of local govts. in decision-making process	Low	High	High	High	High	Low	High	High
Community involvement in decision-making process	No	No	High	High	No	No	High	High

4.3.4 Requirements to the planning process

As mentioned in the previous chapter, some programmes or legislations consider requirements to the planning process in order to ensure a certain standard of quality of projects. That is the case in Germany, where the federal government established comprehensive planning procedures that include assessing the impact of alternatives, increasing transparency and thereby acceptance and ownership. This facilitates negotiation between interest groups, and promotes community involvement in the phases of planning, development, implementation and monitoring infrastructure projects. The objective of all these elements is to improve the sustainability of projects by incorporating many relevant aspects of the local situation.

In order to combine and secure the infrastructure planning and performance of different transport modes, most federal states concentrate their planning processes into one integrated transport master plan. The master plan development is under the responsibility and coordination of the transport authorities of the federal states. Throughout the multi-level planning process of urban transport projects, the state and municipal levels,

as well as representatives of different interest groups and academic experts are included in the feedback and decision-making processes. The role of the integrated transport master plan is to develop an overall transport infrastructure necessity plan for the federal state, including urban transport projects.

In general, the other national programmes reviewed also establish mandatory planning procedures, as a minimum requirement to obtain national funding for capital investments.

In frameworks such as the one developed in Germany, resources are released after the submission and review of a technical project proposal, which includes identification of the area to intervene, feasibility studies, alternatives analysis and project design. This model is straightforward and non-bureaucratic, but risk management falls strongly on local governments where institutional capacity can be extremely diverse. In the case of Brazil, Colombia, India, Mexico and the United States, different stages of evaluation are established allowing more accurate tracking of the project's progress and having a closer control of the risks involved and the measures taken to prevent or mitigate them. For

Standard process to develop the integrated transport master plan in Northrhine Westphalia

The German federal state of Northrhine Westphalia introduced a new law on integrated transport master planning (*Integrierte Gesamtverkehrsplanung, IGVP*) in 2000. Instead of planning for each transport mode separately the integrated transport master plan includes all transport modes in one plan. In addition, it not only takes into account social, economic and ecological impacts of possible transport developments, but also assesses the origins of transport demand creation in order to avoid future transport demand.

The development of the IGVP follows a standard process:

1. Arrangement of project board, comprised of representatives from relevant areas of the federal state government and representatives of municipal governments;
2. Arrangement of an academic advisory board;
3. Creation of regional working groups within municipalities;
4. Continuous data collection and creation of an internet-based information system;
5. Compilation of data for model analysis;
6. Creation of model network based on available data for national scenarios, using state-specific framework;
7. Development of different scenarios with connected options for action for the state government, decision in favour of one feasible scenario;
8. Definition of goals and an evaluation system for future infrastructure measures;
9. Project discussions and applications within the districts;
10. Creation of model calculations for a specific year to assess and evaluate the projects;
11. Consultation of projects within the district governmental boards;
12. Presentation of the transport infrastructure necessity plan to the transport council of the state government.

instance, United States has established three decision points for project approval (FTA, 2009):

1. After the analysis of alternatives and evaluation of the planning system, an estimate is carried out for the financial viability of a project;
2. During the engineering of the preliminary design; and
3. Once the final design is presented.

The case of Mexico is relatively similar. It also establishes three evaluation stages (FONADIN, 2012):

1. Pre-feasibility, in which a general documentation states if a project is viable to enter the eligibility system for funding;
2. Feasibility, where the sponsor presents the project in greater detail; and
3. Investment, the phase in which the Advisory Working Group gives its final recommendation to the project and the financing agreement is signed between BANOBRAS and the state or municipality who presents it.

While the inclusion of more evaluation stages helps to have a tighter control of the proposal, it also makes the handling of the financing process slower and more

cumbersome. This is the case of Brazil and India, where the multiple instances of project approval, in which many central and local governmental institutions participate, pose an excessive bureaucratic burden on proposals. The case of Brazil is paradigmatic: there, three ministries are involved in the evaluation process:

- The Ministry for Cities establishes guidelines for selecting projects to be funded by national urban transport programmes, as well as ranking and indicating proposals for credit operations.
- The Ministry for Planning, Budget and Management overlooks the demands of all the ministries and makes the final decision on all federal funding.
- The National Treasury, following the requirements of the Fiscal Responsibility Law, checks the debt capacity and credit worthiness of the applicant state or city.

In India, as mentioned before, the large number of public institutions from different sectors involved in extremely complicated planning evaluation processes – both at the local and the federal level – has resulted in that only a small percentage of the resources provided to finance public transport in the JnNURM has been disbursed to local authorities and has achieved its objectives.

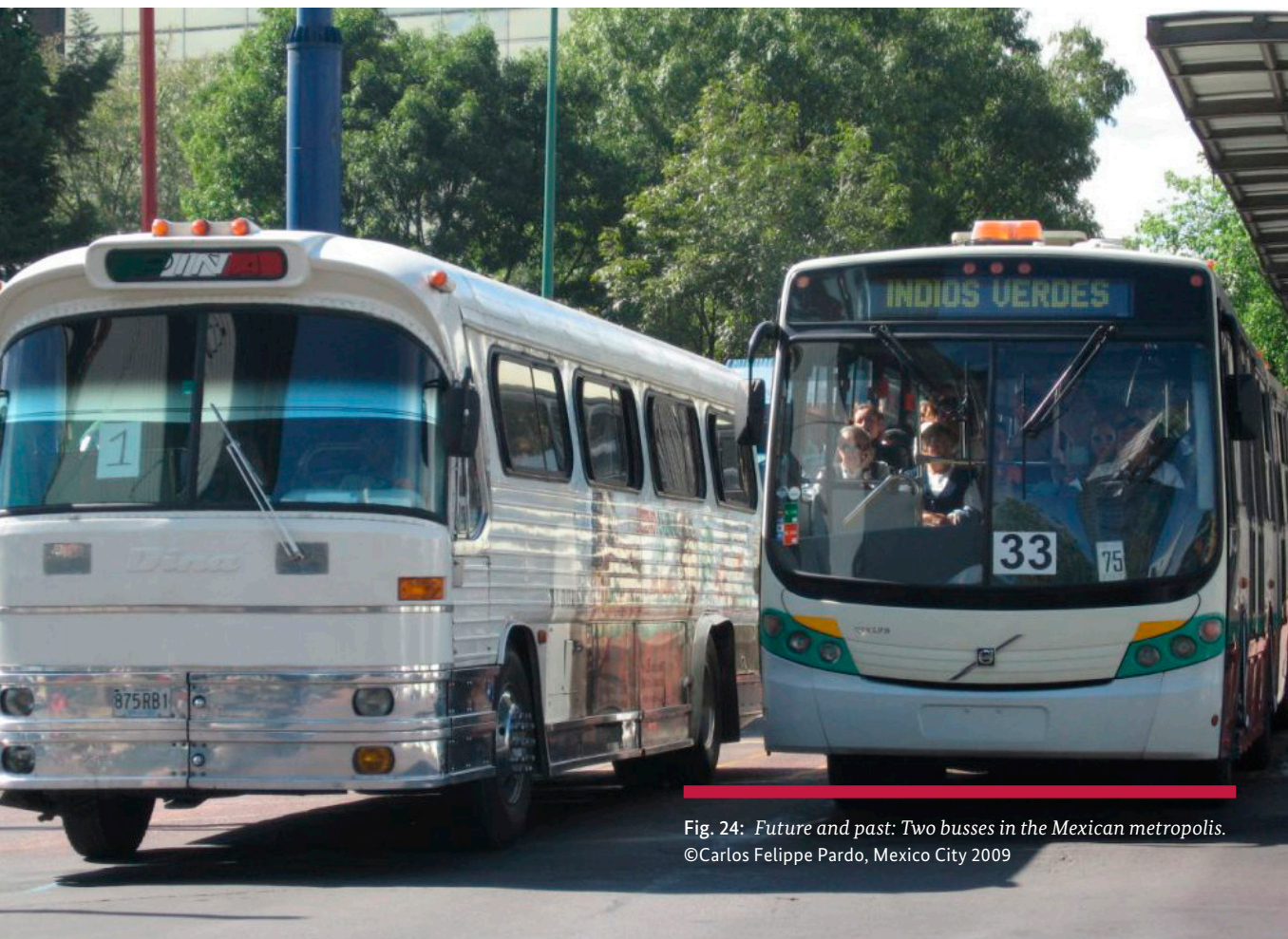


Fig. 24: Future and past: Two buses in the Mexican metropolis.
©Carlos Felipe Pardo, Mexico City 2009

4.4 Capacity development at the local level

The reviewed national programmes and regulatory frameworks identify local technical capacity development as a key element for the proper planning, implementation and operation of sustainable urban transport systems. The lack of proper capacity and highly qualified technical teams to lead long-term and highly complex projects is a common problem for local governments, especially in developing countries and emerging economies. If capacity is limited, monitoring and evaluation systems are also missing. In addition, baseline data is often unreliable and outdated complicating alternatives evaluation, cost-benefit analysis of projects and evaluation of operating systems. The lack of mobility observatories or permanent monitoring systems not only hinders proper decision-making related to project funding, but also obstructs accountability and citizen oversight, making the implementation of improvement mechanisms difficult. Furthermore, where there is greater reliance on external service providers and operators, in-house capacity must still be sufficient so that contract negotiations are not dissymmetrical.

The existence or lack of skilled technical teams defines the adequate type of planning and financing model to follow. Thus, for those countries with stable and highly qualified local units, the adoption of a decentralised model appears as the best choice

The decentralised model can also be supplemented with national training programs for local officials. These usually focus on the dissemination of best practices, technologies, procedures and national standards. Even countries with highly decentralised schemes, such as Germany, have national training programs. Such is the case of the Cycling Academy, funded by the Federal Ministry of Transport, Building and Urban Development (BMVBS), which is a fundamental part of the National Cycling Plan. The Academy provides training to local transport and urban planning agencies involved in the implementation of urban cycling projects. Training topics include engineering of cycling infrastructure, road safety, traffic management, legal issues related to cycling, communication and cooperation to promote cycling, etc. Thereby, the term “Cycling Academy” also serves as brand name for high quality practice-oriented training. Examples for training topics are *e.g.* designation of specific surfaces for cycling traffic, opening of one-way streets for two-way cycling traffic or provisions restricting cycling traffic on footpaths to protect pedestrians and improve transport safety. In addition

to trainings, the cycling academy also organises annual regional conferences that are located in a different city each year in order to facilitate direct exchange between planners.

Germany, France and the UK have all benefited from a variety of programmes and demonstration projects funded centrally by the European Union. This has developed capacity and also provided important transfers of knowledge between countries and cities. The CIVITAS^[9] programme is one example.

Another ambitious programme has been developed in the United States, where the Department of Transportation has implemented the Transportation Planning Capacity Building (TPCB) Programme, oriented to train local professionals in charge of maintenance, operations and planning of urban transport systems. The TPCB has four broad goals (USDOT, 2013):

- Enhance professionals’ understanding of the federally-defined transport planning process, their role within the process and the relationship between the planning process and community goals.
- Strengthen understanding and build skills in planning, consensus building, policy guidance and regulations.
- Disseminate commendable examples of effective transport planning practices.
- Equip new Metropolitan Planning Organisations and areas newly designated as air quality non-attainment areas with skills and knowledge needed for effective transport planning.

In a similar way, national policies in Colombia support local governments through technical assistance and training programmes. A working group attached to office of the Vice-Minister of Transport supports project implementation in the following areas: administrative, financial and accounting, construction and acquisition, social management of resettlements, communications, environmental management and project tracking. In the case of India a provision requires that expert consultants are hired to work with local governments to identify the best solutions for a city’s transport system and to develop the technical project. The resulting documents are then assessed to decide whether or not to finance the

^[9] The CIVITAS Initiative (*City-Vitality-Sustainability, or Cleaner and Better Transport in Cities*) aims to support European cities to introduce transport measures and policies towards sustainable urban mobility. So far projects in 59 cities have been or are being supported.

implementation of the suggested projects. In addition, nationally funded “Centres of Excellence” have been established at leading universities to develop training programmes for local officials and advance research on best practices and tools. At the same time, the Ministry of Urban Development with the support of UNDP and the World Bank facilitates additional capacity building activities and technical visits.

As mentioned above, countries with a lack of highly qualified local teams tend to adopt centralised planning and funding schemes. In these countries, local capacity development is reached by involving the cities’ teams in the development of projects led by the institutions at the central level (learning by doing), and through national training programs. This approach brings together local knowledge with national level technical capabilities. A scheme of this type provides a good incentive to those local governments with little economic and human capital, and enables them to embark on long term projects of high complexity. Regarding training programmes in developing countries, they are not focused exclusively on the technical aspects of the projects implementation and development, but also on acquiring skills on problem solving, negotiation and leadership which are extremely important in long-term initiatives that involve participation of a large number of actors with diverse interests. In countries like Brazil, Mexico and Colombia, who base its service operation on the formalisation of thousands of small private entrepreneurs (many of them informal) training extends beyond public officials, including private system operators. Universities and NGOs are usually involved in this work, such as in Iniciativa Mexico, which is focused on training traditional transport operators interested in becoming formal urban public transport companies to give but one example.



Fig. 25: Green lights for busses, taxis and cars in the Brazilian metropolis.
©Lux, Rio de Janeiro/Brazil 2010

5 Conclusion

This paper analysed funding of sustainable urban transport in eight countries (Brazil, Colombia, France, Germany, India, Mexico, the United Kingdom and the United States). The countries were selected to provide a mix of experiences both from developing and developed nations. The review intends to inform decision makers in China and elsewhere as they develop financing programmes or regulatory frameworks for sustainable urban transport. The analysis of international experiences can help to find answers to the following four questions:

- What is the most adequate institutional arrangement in order to carry out a national policy of sustainable urban transport in my country?
- What can national governments do to establish a financing framework to ensure a more sustainable development of urban transport?
- What are suitable procedures and criteria for national-level funding of urban transport (construction, maintenance and operation)?
- How to develop capacities at the local level?

The authors analysed the financing models adopted by each country and identified two fundamental models of financing sustainable urban transport:

1. Centralised Funding Programmes
2. Decentralised Financing Policies

The analysis showed that Decentralised Financing Policies and funding frameworks generally require a higher degree of technical and organisational capacity at the local level than those that are more centralised as they

shift the responsibility for project identification, design, implementation and evaluation to local authorities. At the same time, the decentralised model provides a high degree of freedom and flexibility to adjust projects to local needs and priorities and thereby promotes local innovation. Centralised Funding Programmes on the other hand provide more technical guidance to local authorities, but also keep fundamental decision powers regarding project design and implementation in the national government. Both models have their advantages and disadvantages and often countries employ a mix of centralised and decentralised elements to fit their local circumstances. So, China's as well as other countries' challenge is not to choose one model or the other, but to know how to best combine the different elements that these approaches offer according to national and local needs.

Building on the outcomes of an expert workshop on Prospects for National-Level Programmes and Funds for Sustainable Urban Transport in China, held in November 2012 near Beijing, the authors identified four main areas that need to be addressed to achieve sustainable urban transport systems: institutional arrangements, continued financial flows, integrated mobility planning and technical capacity. Building on the analysis of how the eight selected countries address these challenges the following four building blocks to develop a comprehensive policy package for a national sustainable urban transport strategy are concluded. Key messages from the international experiences in these areas and suggestions on their applicability to China are presented below:

1. Building effective institutions for sustainable urban transport

WHAT

There is no single formula for effective institutions. Centralised and decentralised approaches are not exclusive; many of the reviewed countries establish combined approaches, which take into account the historical governance structure of a country, the size and characteristics of their urban regions and their capacity to plan, implement and operate urban transport systems. However, the case studies showed that in cases where too many different stakeholders are involved, decision-making and implementation can be hindered if processes are not clear.

HOW



Effective institutions require clear responsibilities and clear cooperation procedures to coordinate multiple stakeholders at all levels, *e.g.* in joint working groups or the mentioned transport alliances established at the regional level in Germany. This process has been used for decades and has proven fairly effective. The creation of region-scale public transport operating authorities can help centralise revenue collection, planning and financing functions. Political leadership across all levels of government is the lifeblood of an effective institutional framework. For China, concentrating the responsibilities for all aspects regarding SUT under the Ministry of Transport and local Transport Bureaus, respectively, holds much potential for addressing the challenge of split responsibilities and weak coordination. A good example for extending the mandate of local transport bureaus already exist in Shenzhen.

2. Securing stable and robust financial flows into SUT

WHAT

A stable, *i.e.* predictable and long-term financial flow into SUT development, operation and maintenance is needed to secure high-quality public and non-motorised transport services. Robust financial flows are those that are built on multiple funding sources, enabling them to better withstand potential fluctuations of individual funding streams.

National level support. No matter if a centralised or decentralised financing framework is chosen, in all reviewed countries, national governments provide financial resources for sustainable urban transport development. Mostly for capital investments, but in some cases also for operations. Whereas centralised funding programmes usually focus on a limited number of cities, the most decentralised financing policy in Germany provides financial support to all cities, channelled through state governments.

HOW

Combining multiple revenue sources. Securing stable and robust financial flows for all phases of SUT, from infrastructure construction, to operations to maintenance, requires a combination of national and local revenue sources. In addition to national support through earmarking certain shares of tax incomes (*e.g.* from fuel taxes, vehicle purchase taxes, annual vehicle taxes, as well as property taxes), cities should be encouraged to generate funding locally through means with a positive impact on urban mobility, *i.e.* through transport demand management measures, such as parking pricing, license plate sales or congestion charging or through value-capture mechanisms.

Sources of funding need to be sustainable. One prerequisite for the design of any revenue generation for SUT must be that they are non-distorting. This means that the generation of resources in itself does not contradict the objectives of sustainable urban transport as is the case, for instance, with revenue generation through land lease without any form of land value capture.

Considering Public-Private Partnerships. More and more cities tender out sub-networks of their public transport network to private operators but ensure quality control and integration into the overall transit system through service contracts that run for a limited time (*e.g.* five or eight years for buses; longer for rail). In this way, public transport may be organised in a very cost-efficient way without compromising service quality. However the period of time that it takes for cities to move from a publicly run system to one that requires managing of private operators should not be neglected. Successful public private partnerships are those that have developed a robust process to manage the partnership and contractual arrangements but also that have built up a level of trust and working arrangements with common values and objectives.

Making funding conditional on process and quality criteria. To incentivise improvements in the development of sustainable urban transport systems, national funding can be linked to process and quality criteria. This requires establishing selection criteria and standards for planning processes that go beyond a purely financial assessment. Factors which may be taken into account for the allocation of resources are the existence of integrated urban development and mobility plans, compliance with minimum standards for accessibility and user comfort, compliance with environmental standards, mandatory alternatives analysis, etc. (see also point three below).

As of today, China is closer to the centralised funding model. It provides no national-scale regular and dedicated revenue flow for public and non-motorised transport to cities. Instead, different pilot programmes provide partial funding to selected cities only. To upscale efforts from pilot cities and building on these special funds for pilot programmes a “National Urban Low Carbon Transport Fund” equipped with permanent finance could ensure all cities with a reliable funding flow for SUT and thus contribute to up-scaling of sustainable transport solutions throughout the country. Setting-up such a financial flow could build on the on-going discussions to include public transport as part of the basic public service system. The fund could, for instance, be fed through diverting a fraction of the fuel tax now dedicated to road infrastructure or through a rise in fuel taxes or new taxes, such as a CO₂ based annual motor vehicle tax or a land-use or property tax.

A National Urban Low Carbon Transport Fund would not only be used for infrastructure development, but also for incentivising good planning, design and evaluation, capacity development, as well as to provide support to public transport operations, currently severely underfunded – which is impacting service quality and attractiveness. Furthermore, a national fund can be used to link funding to certain quality and process criteria (see next point).

3. Facilitating integrated mobility planning

WHAT

The success of SUT systems heavily depends on land use and infrastructure policies and plans. Urban development needs to be conceived comprehensively and consider the implementation of integrated transport systems.

Linking national funding for SUT to a requirement on the existence of integrated mobility plans is a strong lever for national governments to foster sustainable urban transport and has proven a successful tool in different countries (*e.g.* India, Germany).

HOW

Clear guidance on integrated mobility planning and performance criteria for sustainable urban transport is needed to provide direction to all cities, especially those with less local capacities.

For China, consolidating existing guidance and policies into one national urban transport policy with clear requirements and criteria for integrated mobility planning would provide more clarity for local authorities. Funding from a potential National Low Carbon Urban Transport Fund could then be made conditional on the existence of comprehensive mobility plans. First experiences with performance-based indicators in China are currently being gathered in the Transit Metropolis Programme.

4. Developing local technical capacity

WHAT

Lack of technical capacity at the local level is one main obstacle to the development of sustainable urban transport systems. In fact, this is the main reason for some countries to adopt a centralised funding scheme. National programmes for strengthening technical capacity within governmental institutions in charge of planning and development of sustainable urban transport systems, programs and projects is an essential ingredient for success in realising SUT. It is also a prerequisite if cities or regions are required to develop integrated mobility plans that cities or regions with less capacity receive capacity development to be able to do so. A national capacity development programme can therefore be linked to and receive resources out of any form of national fund or programme for SUT.

HOW

For China, too, improving local capacities is one important aspect to move closer to its goal to realise its public transit priority and promotion of non-motorised transport. Improving in-house capacity is also necessary to avoid asymmetrical and negative contract negotiation outcomes with public transport service providers under public-private partnerships.

Combined into one integrated policy package, the above four building blocks can maximise the economic, social and environmental impacts of national programmes. Clearly, realising such a comprehensive package requires time and may be implemented gradually, under a strategy that combines mainstreaming and structural reform. This way centralised schemes can evolve to decentralised models following cities' continuously

growing experience in the implementation of SUT interventions, as well as the consolidation of technical teams in charge of planning, implementation, operation and maintenance of SUT systems. In this sense, China's long and rich experience in pilot project development provides a solid base for the implementation and subsequent monitoring and evaluation of new planning, financial and institutional frameworks.

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