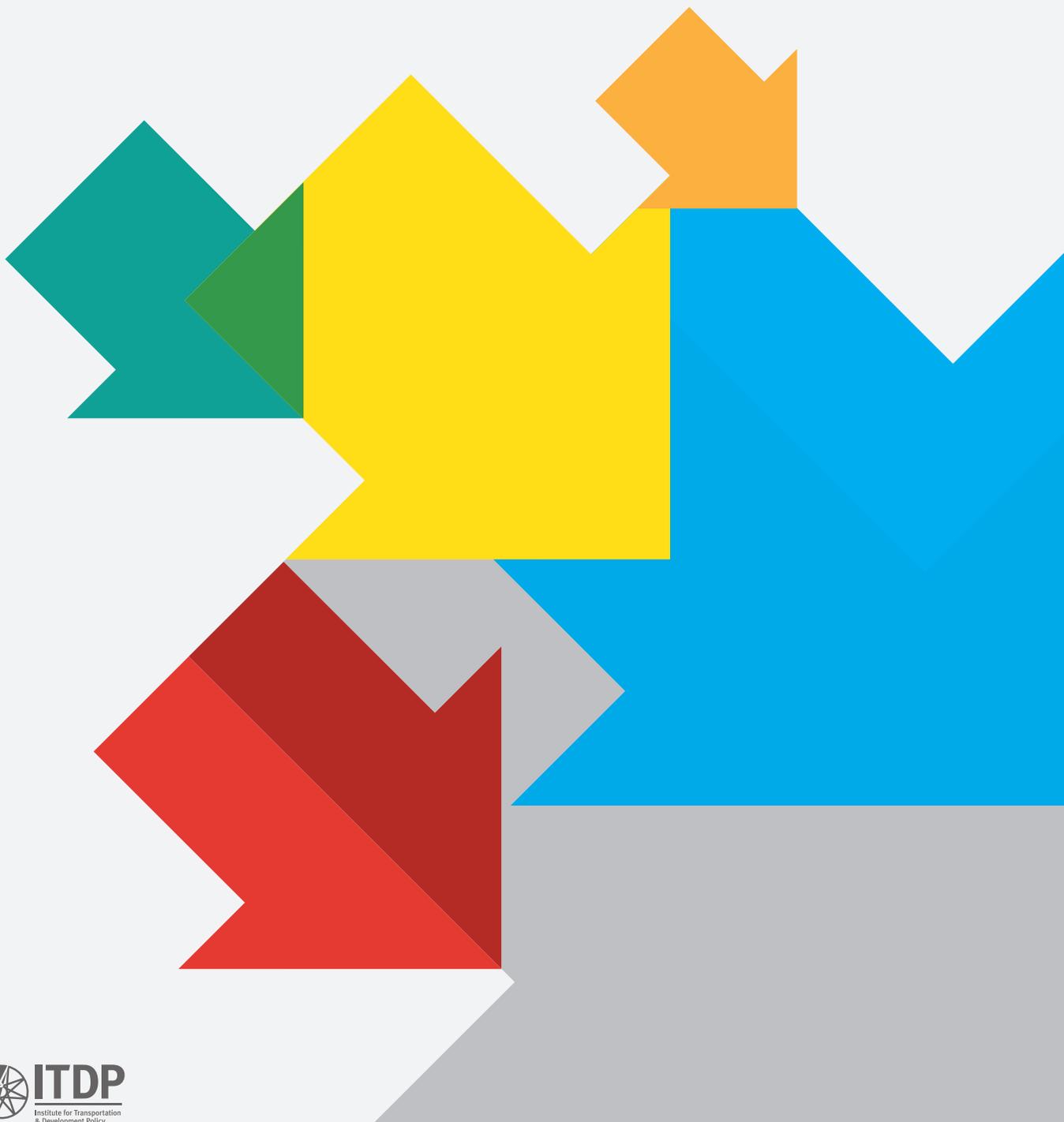


A PARADIGM SHIFT TOWARDS SUSTAINABLE LOW-CARBON TRANSPORT

Financing the
Vision ASAP

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**A Paradigm Shift Towards Sustainable
Low-Carbon Transport**

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The work is made in contribution to the aims of the Partnership on Sustainable Low-Carbon Transport (SLoCaT Partnership), a group of organisations working to enhance the contributions of the transport sector in addressing climate change within the context of sustainable development.

This White Paper draws from and is intended to contribute to a number of other related initiatives, for example the work conducted by the German Technical Cooperation (GTZ) on its Sourcebook Module on Financing Sustainable Transport.

The paper is an initial attempt to identify the challenges and actions needed to finance the paradigm shift towards sustainable, low-carbon transport in developing countries. It is meant to be a living document, to which further work by SLoCaT members can be added.

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Executive Summary

The rapid growth in transport activity, based primarily on private motorised vehicles, generates social, environmental and economic costs. Transport already accounts for more than half of global liquid fossil fuel consumption and nearly a quarter of the world's energy related carbon dioxide (CO₂) emissions (IEA, 2009). If current trends continue, transport related CO₂ emissions are expected to increase by 57% worldwide between 2005 and 2030, mainly as a result of rapid motorisation in developing countries.

The need for a paradigm shift: Leapfrogging towards a low-carbon, sustainable transport system

Developing countries can benefit from “leapfrogging” to a new sustainable and low-carbon paradigm that avoids the costly, unsustainable levels of motorisation seen in the developed world, in particular North America. By investing in sustainable low carbon transport systems today, developing countries would reap various economic, social and environmental benefits during the next half century and beyond.

Current financing practices: Not fit for purpose

Much of the observed failures in transport are due to the financial framework from which policies, programmes and projects draw resources. While notable exceptions exist, the financing framework is often skewed towards supporting the motorisation model as follows:

- **Domestic public finance** is mainly used to build and maintain infrastructure to cater to increasing levels of motorised traffic. Budgets are often rigid and difficult to reform due to the prevalence of earmarks. Project appraisal frameworks usually follow the mainstream practice of valuing time and vehicle cost savings—the two main benefits of transport schemes—whereas climate and other environmental effects are generally given lower priority. Furthermore, a significant amount of public finance is spent on environmentally harmful subsidies, most notably on fossil fuels.

- **Official Development Assistance** (ODA) flows are directed towards development based on the motorisation model, reflecting both the requests of recipient countries as well as the menu of technical assistance provided by donor organisations. Financing is particularly directed towards construction as a result of strategic planning, the current appraisal framework which generally only values time and vehicle operating cost savings, and the inadequate safeguards to halt environmentally harmful projects from being implemented.
- **Private flows** are also directed towards the development of goods, services and infrastructure that support the motorisation model of transport development, e.g. motor vehicle manufacturing. One reason is the exclusion of environmental and social costs in the pricing of transport services in most countries, distorting market signals. Regulatory measures, for example emission standards for new vehicles, are currently inadequate in scale and scope to provide a strong signal to the contrary.
- **Carbon finance** is generally limited in scale and access to these resources is further reduced by the requirements placed upon the transport sector, i.e. a narrow approach to measuring the mitigation potential of policy actions (and the associated incremental costs), together with the lack of data to allow the measurement, reporting and verification of mitigation actions. Carbon crediting mechanisms such as the Clean Development Mechanism (CDM) suffer from large transaction costs, due to the dispersed nature of transport emissions.

Financing the paradigm shift ASAP: Analyse, Shift, Add, Pay

There is therefore a clear need for all transport-relevant financial flows to be reoriented towards sustainable transport, to achieve the required paradigm shift. In moving forward, a holistic strategy is suggested, involving the following elements:

- **ANALYSE** the impacts of financing decisions taken by relevant stakeholders on sustainability;
- **SHIFT** existing resources towards a sustainable direction;
- **ADD** / increase funding for those areas where resources are lacking; and
- **PAY** for the full costs of transport including environmental depreciation.

A roadmap of actions: Common but differentiated responsibilities

The ASAP strategy can be enacted by the collective action of various stakeholders, including, but not limited to:

Developing and developed country governments (national and local) – that can

- Shift their domestic budgets towards a sustainable direction,
- Shape the way in which international support for transport is provided, and
- Provide market signals to the private sector to invest in sustainable ways by applying appropriate pricing mechanisms (such as fuel and vehicle taxes, road pricing, parking charges and distance-based insurance) as well as phasing out fuel subsidies.

Multilateral Development Banks and bilateral development agencies – that can

- Evaluate the GHG impacts and/or carbon intensity of investments and technical assistance, and
- Direct their technical assistance to develop capacities, institutions and knowledge in support of sustainable transport, and
- Align their grant support and lending criteria with sustainability objectives, and catalyse major changes in domestic priorities as a result.

Export credit agencies – that can

- Shift their focus towards facilitating the diffusion of sustainable transport vehicles and promote sustainable infrastructure investments.

United Nations Framework Convention on Climate Change (UNFCCC) and other climate finance institutions/mechanisms – that can

- Facilitate the development of a Post-2012 climate change architecture and mechanisms, including provisions for measurement, reporting and verification (MRV), that would fully allow the transport sector to contribute to mitigation efforts.
- In coordination with development agencies, direct current and future climate financing mechanisms towards capacity building, technology transfer and policy support, to leverage further investments from other sources.

The private sector – that when given the right market signals, can

- Invest in, revolutionise and create new technologies and services that support sustainable transport.

Non-government Organisation (NGOs) / civil society and academia – that can

- Lead the development of new holistic methods to assess the costs and benefits of transport interventions, and act as advocates for sustainable transport through campaigning, research and public communication.

In moving rapidly and concertedly towards the development of low-carbon sustainable transport, it is imperative that actions are coordinated among all levels of governance and funding sources. This requires among others:

- A shared understanding of the global vision and local priorities for sustainable, low-carbon transport and its core elements.
- Identifying synergies and comparative advantages between financial flows/mechanisms, to maximise effectiveness and minimise contradictions.
- Sharing the tools and methods throughout the policy-making cycle, for example harmonising guidelines and analysis methods as well as jointly developing transport programme/project appraisal toolboxes and data monitoring systems.

Introduction

Background

The urgent need for sustainable transport

Transportation is central to the social and economic activity of people across the world. Yet current transport patterns, based primarily on private motorised vehicles, generates many social, environmental and economic costs, accounting for more than half of global liquid fossil fuel consumption and nearly a quarter of the world's energy related carbon dioxide (CO₂) emissions (IEA, 2009).

Transport is also typically responsible for around 80% of developing cities' local air pollution and more than 1.3 million fatal traffic accidents worldwide, most of which occur in developing countries (WHO, 2009). Furthermore, the chronic traffic congestion caused by excessive motorisation leads to lower productivity and reduced levels of accessibility in many of the world's urban areas.

Figure 1: Chronic congestion and heavy air pollution in Jakarta, Indonesia



Developing countries have the opportunity to leapfrog towards a sustainable, low carbon transport paradigm.

These unsustainable patterns of transport are expected to worsen under the continuous and rapid trend of motorisation. There is a growing consensus by experts, policy makers and the general public that these trends cannot continue without seriously affecting the economic viability and environmental quality of their cities and countries.

What is required to reverse this trend is the “leapfrogging” of the paradigm, whereby developing countries fully use the opportunity to develop their transport systems in a sustainable, low-carbon manner, providing enhanced accessibility and communication without committing to the same level of motorisation seen in the developed world, and in particular North America.

A key change will need to take place in how the costs of transport are internalized, as the wider costs to society arising from road accidents, poor health, social impacts and environmental degradation, often described as the ‘external’ costs, are currently excluded from the price that transport users confront. The key characteristics of unsustainable and sustainable transport are contrasted in Table 1 below.

Table 1: Key characteristics of unsustainable and sustainable transport

	Unsustainable transport	Sustainable transport
Transport volume	Requires a high level of numbers of trips and trip distances, due to sprawled urban development and inefficient logistical networks.	The demand for travel is minimised and journeys are short, owing to compact urban development, mixed land use and optimised logistical chains.
Transport modes	Reliance on private motorised transport for passengers, and heavy goods vehicles for freight.	Most passenger trips are made by public or non-motorised transport, and freight is carried by rail and other low-carbon modes.
Transport technologies	Vehicles rely on inefficient, fossil-fuel engines.	Low carbon vehicle technologies are mainstreamed, including highly efficient engines, hybrids, plug-in hybrids and electric vehicles.
	The transport network is inefficiently managed.	New technologies such as “Intelligent Transport Systems” and “Smart Logistics” help manage transport systems in highly efficient ways.
Transport pricing	The price paid by users for vehicles, fuel, parking and road space do not cover the full external costs to society, encouraging motorised vehicle use at the expense of more sustainable choices.	The price paid by transport users fully ‘internalises’ the true costs, managing growth in motorised vehicle use and encouraging environmentally friendly alternatives.
Resilience to climate change	Transport systems are highly vulnerable to changes in the climate.	Transport assets are screened against vulnerability criteria, and are developed in a way that is resilient towards changes in climate.

Role of financing in supporting sustainable low-carbon transport

Much of the failure with current transport is due to an often neglected but major issue, namely the financial framework from which transport policies, programmes and projects draw their resources.

The current patterns of unsustainable transport directly reflect the investment and consumption patterns of the past to which many industrialised countries remain attached, and to which many developing countries are now headed. In view of the need to leapfrog towards a more sustainable low-carbon transport sector, financing must act as a crucial enabler of the required changes.

The debate surrounding the role of financing in enacting sustainable development has seen acceleration in recent years. For example within the context of the climate talks, there is continued debate on how mitigation actions (especially in developing countries) could be supported by (international) financing. Initiatives are also being taken by several developing countries and their cities to finance sustainable transport.

To further encourage such developments, it is important that climate-oriented financing mechanisms are designed to holistically support efforts in the transport sector, and that barriers (both perceived and real) such as the

**Financing:
Providing the resources
to enable sustainable
transport.**

quantification of additionality and provision of up-front financing are addressed.

However, it is clear that climate-oriented financial mechanisms alone will not be enough to achieve the overall paradigm shift required in developing countries since dedicated climate-oriented financing mechanisms are expected to provide only a part of the overall funding required.

It is vital that a wider range of transport-relevant financial flows are assessed and reoriented to achieve the shift in paradigm towards sustainable transport. Such wider flows include international public flows (e.g. Official Development Assistance (ODA), export credits etc), domestic public flows and private financial flows.

Objectives and scope

In this context, this White Paper seeks to provide an overview of the current financing framework, and present a set of concrete and practical actions towards building a new framework that fosters sustainable low-carbon transport in developing countries.

In doing so, the paper aims to contribute to the development of the Post-2012 climate change policy framework, the outline of which is likely to emerge in the lead-up to and beyond the 16th session of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP16) in Mexico in late 2010.

The focus of this paper will mainly be on land transport in developing countries, although it is fully recognised that actions by developed countries will strongly influence the outcome in developing countries – e.g. through the development of transferable technologies, or through leading by best practice. The paper also focuses on urban passenger transport, although the importance of freight transport and rural transport are highlighted wherever possible. The paper concerns mainly the mitigation of climate change as its focus, but implicitly recognises that resilience to climate change (adaptation) is a key aspect of sustainable transport. This paper will predominantly focus on public decision-making processes (both national and international), although reference will be made throughout the paper on the importance of engaging with the private sector, and maximising their potential contributions to achieve the common goal of financing sustainable low-carbon transport.

Although the paper is linked to the ongoing climate negotiations, it seeks to address all major financial flows relevant to developing sustainable, low-carbon transport, for example domestic public finance, private finance and other forms of international public finance such as ODA. Needless to say, the environment surrounding these financial flows is rapidly changing. Hence, this White Paper (whilst attempting to provide a comprehensive assessment) is meant to provide a snapshot of the current situation and corresponding actions.

Structure

The paper is comprised of the following sections:

First, we outline the current financing paradigm, and highlight the main problems of the major financial flows relevant to transport, namely private flows, domestic public flows, international public flows (ODA) and climate finance.

Second, we provide a direction forward, starting with a policy vision and a framework comprising four key elements of a so-called ASAP strategy, namely to:

- **ANALYSE** the impacts of financing decisions taken by relevant stakeholders on sustainability;
- **SHIFT** existing resources towards a sustainable direction;
- **ADD** / increase funding for those areas where resources are lacking; and
- **PAY** for the full costs of transport including environmental depreciation.

Furthermore, we examine how the ASAP strategy can be put to practice, to modify the current financial flows.

We then provide key policy recommendations for major stakeholder groups identified, including developing and developed country governments, development agencies, export credit agencies, UNFCCC and other climate finance institutions, the private sector, and NGOs/civil society/academia.

Finally, we provide the next steps for the transport and climate community in implementing the concepts and actions identified within this paper.

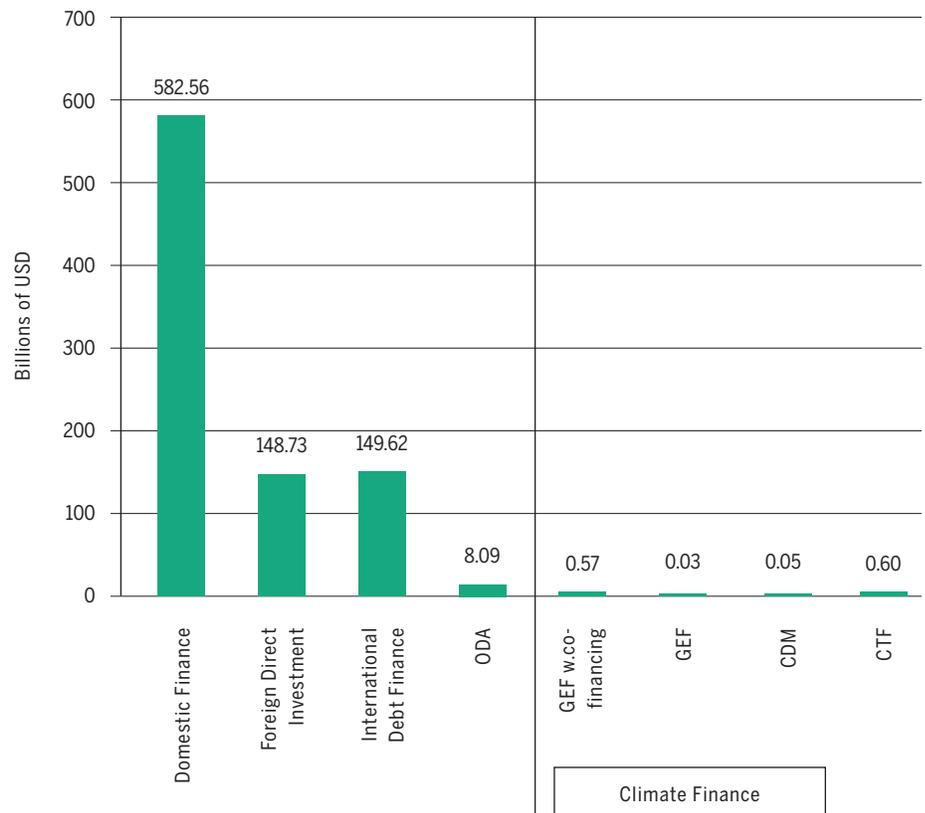
The Current Paradigm

State of financial flows

The design of a new framework to support sustainable low carbon transport begins with an understanding of the current financial framework in its largest sense. To this end, an overview is provided of the major types of financial flows that affect the sustainability including domestic and international, public and private, climate and non-climate specific sources.

Figure 2 provides a rough sketch of available financial resources showing that domestic flows (public and private) are typically available in hundreds of billions, if not trillions of dollars, followed by foreign direct investment and international debt finance. Official development assistance (ODA) is available in the magnitude of billions of dollars. Sources of climate finance such as the Clean Development Mechanism (CDM) and Global Environment Facility (GEF), explained in more detail in “Climate funds and mechanisms”, page 17), are even another magnitude smaller and are dwarfed by other financial flows. This reemphasizes the need to examine the wider financial flows relevant to the transport sector when designing a new financial framework that holistically supports sustainable low carbon transport.

Figure 2: Global transport investments by source of finance in annual terms ¹



Transport is shaped by financial flows from various sources – public and private, national and international.

There are many ways of categorising financial flows relevant to transport – however for the purpose of this White Paper, the following are used, and detailed further in the below sections:

- Domestic public funding
- International public flows (e.g. ODA)
- Private finance (including foreign direct investment, often supported by export credits²)
- Climate finance

Domestic public funding (national and local)

Domestic public finance is a dominant source of financing for many aspects of transport, including infrastructure construction and maintenance, and public transport provision.

Transport is a major outlay in the budgets of both national and local

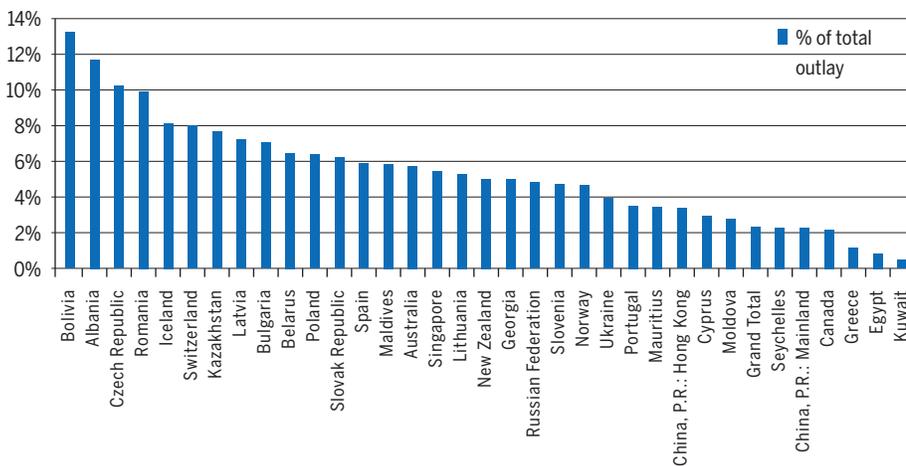


Figure 3: Percentage of transport in national budgets for selected countries in 2005
SOURCE: IMF, 2010a

BOX 1: MEASURING FINANCIAL FLOWS

Measuring relevant financial flows is fraught with difficulties. As stated in OECD (2009), "There is little information available on what resources flow towards mitigation within developing countries or across developing country boundaries (South-South flows)". This is due to (amongst other reasons);

- Lack of monitoring and accountability of public finances
- Lack of, or inconsistent categorisation/definition of financial flows
- Commercial confidentiality (particularly for private flows)

- The informal nature of transport service provision in most developing countries e.g. taxis and buses operating in the 'grey' economy, where most financial transactions do not appear on balance sheets.

Effort must therefore take place to improve transparency and accountability of flows for all sources of finance. Such efforts can be linked to a wider effort on budgetary and regulatory reform occurring in countries across the world in the aftermath of the financial crisis of 2008/09.

governments. Figures from IMF (2010a) indicate that countries typically spend around 2 to 13% of their public budgets (total outlays including national and local level) on transport.³

Public spending is generally categorised into capital versus revenue funding. The former is responsible for the provision of fixed assets such as infrastructure, whereas the latter covers recurring costs such as maintenance and operation. In many countries, there is a mismatch between capital and revenue funding. This is due to the heavy competition for revenue funding (vs. other sectors), as well as the fact that market failures inhibit private investment and innovation.

Cities and local governments also allocate a significant amount of their budgets to transport. The sector often takes up 15 to 25% of city budgets (World Bank, 2001).

In most developing countries much of the transport outlays are focused (and sometimes earmarked) towards supporting motorised private transport in the form of intercity highways, urban ring roads, and flyovers.

The above trends are driven mainly by political and economic demands, whereby:

- Road infrastructure is perceived to be a “driver of economic growth”⁴.
- Public policy is often formulated by the relatively rich members of society, who give preference to private motorised vehicles.
- Consumers are generally pulled towards motorised modes due to increasing prosperity and also the relative ease of access to credit for purchasing motorcycles and light duty vehicles.⁵ Businesses also provide incentives for their employees to own cars, further accelerating car use.⁶
- For several larger developing countries such as China, India, Indonesia, and Malaysia, vehicle manufacturing is regarded as a “strategic industry” which supports manufacturing and export-led growth. This to a large extent mirrors the development approach taken in several industrialised countries such as Germany and Japan.

BOX 2: THE AUTOMOTIVE INDUSTRY IN MALAYSIA

Malaysia, like many other Asian countries, has long placed strategic importance in its automotive industry in its aim to become a developed country by 2020. Since the 1960s, it has promoted policies to build on this industry, for example by placing protective import tariffs and requiring a certain proportion of a vehicle's parts to be manufactured locally.

In the 1980s, it successfully launched its National Car Project (known as PROTON) which (together with the later PERODA enterprise) dominates the domestic car market. (See UNESCAP, no date)

International public flows

Resources provided to developing countries from external sources (foreign industrialised country governments or multilateral finance institutions) also play a major part in shaping transport patterns. Such flows include Official Development Assistance (ODA) and Export Credits, as defined below. These flows are labelled as public financial flows in this White Paper. However, they are strongly linked to private financial flows in that they facilitate foreign (private) investments in developing countries.

Official Development Assistance (ODA)

The OECD defines ODA as: “Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 percent” (OECD, 2009).

ODA given by industrialised countries is typically divided into two categories. The first is multilateral assistance through multilateral development banks (MDBs) and other international development organisations.

The second is bilateral assistance, conducted by country-specific development agencies and banks such as USAID (USA), JICA (Japan) and AFD (France). Figure 4 shows that transport and storage receives more than 5 billion USD of bilateral ODA commitments.

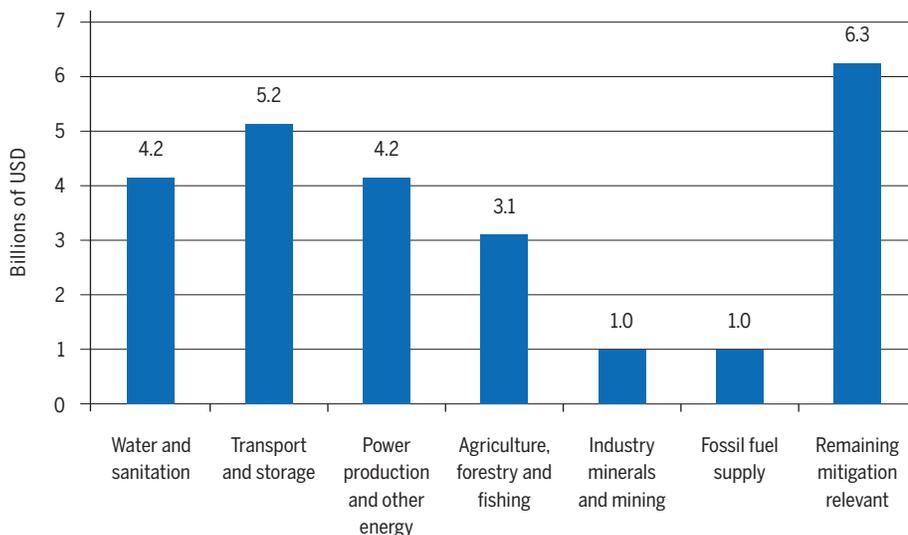
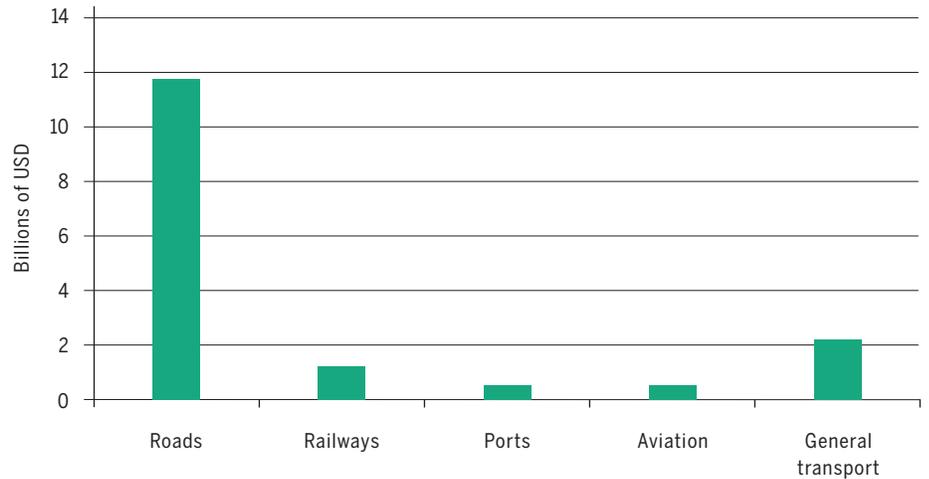


Figure 4: Bilateral ODA commitments for mitigation of relevant sectors per annum AVERAGE 2003-2007, DATA SOURCE: OECD DAC-CRS DATABASE 2009

A major characteristic of the majority of ODA in transport (both multilateral and bilateral) is the focus on road building, including intercity highways, flyovers and ring roads in urban areas. This is shown in Figure 5 below which looks at the World Bank as a typical example. Other regional development banks have similar splits in their lending portfolios.

Figure 5: Transport lending by the World Bank (2001-2006)

WORLD BANK, 2007



The focus of ODA is still placed on economic development and poverty reduction in recipient countries, which when applied to the transport sector translates into:

- The enhancement of regional/international trade through the extensive construction of highways and ports
- Poverty alleviation through labour-intensive road construction methods and providing access to markets (especially in rural areas)

In comparison, carbon emissions and environmental sustainability are still given lower priority, and remain mostly unanalysed. For example, the appraisal of transport projects generally focus on the reduction of vehicle operating costs and time costs, favouring schemes such as highways that initially reduce these cost components through their construction.

Mirroring the above situation, there has traditionally been little appetite from recipient countries for low-carbon transport, owing to the perceived lack of alternative development paths, as well as the mainstream notion that road building and vehicle manufacturing are core aspects of economic development. On the other hand, there have also been initiatives such as the development of bus rapid transit (BRT) systems in Latin America and elsewhere, attention to high speed networks for example in China, and the formation of regional Environmentally Sustainable Transport (EST) forums which suggests that the appetite for sustainable transport in developing countries is increasing. The challenge for ODA is therefore to further encourage such developments by creating a supportive environment.

Export Credits

The OECD defines export credits as: "...government financial support, direct financing, guarantees, insurance or interest rate support provided to foreign buyers to assist in the financing of the purchase of goods from national exporters" (OECD, 2010). Export credit agencies (ECAs) of industrialised countries generally provide direct loans or guarantees to promote investments in riskier markets, i.e.

developing countries.

By reducing the risk, and increasing the returns on investments in developing countries, export credits play a major role in catalysing private financial flows into those countries, typically expressed as foreign direct investment (FDI).

As shown in Figure 6 below, the transport sector is a large recipient of export credits, accounting for nearly half of all long-term (more than 5 years) credits issued by OECD member countries. Currently, the vast majority of these credits are used to support the export of aircraft and marine vessels, which are typically of large financial value.

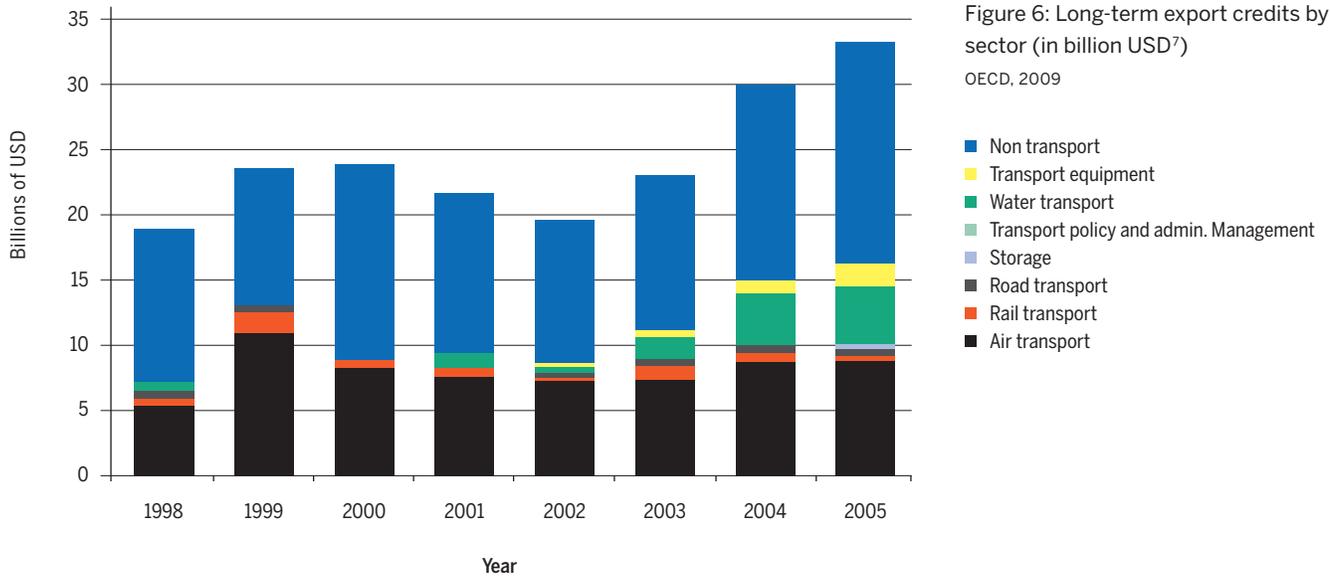


Figure 6: Long-term export credits by sector (in billion USD⁷)
OECD, 2009

Private flows

Perhaps the most underestimated, yet largest type of financial flow surrounds private actors, ranging from large international construction firms to individual (and often informal) providers of transport services.

In most market-based economies, the private sector accounts for the majority of economic activity, measured, for example, in value added. Hence, understanding how to redirect financial flows towards supporting sustainable, low-carbon transport becomes a central concern.

Currently, the majority of private money is directed towards supporting a motorised pattern of transport. Areas of transport where the private sector plays a dominant role include:

- Motor vehicle manufacturing and maintenance
- Engineering and construction of infrastructure (increasingly under public private partnerships.)
- Operation of infrastructure

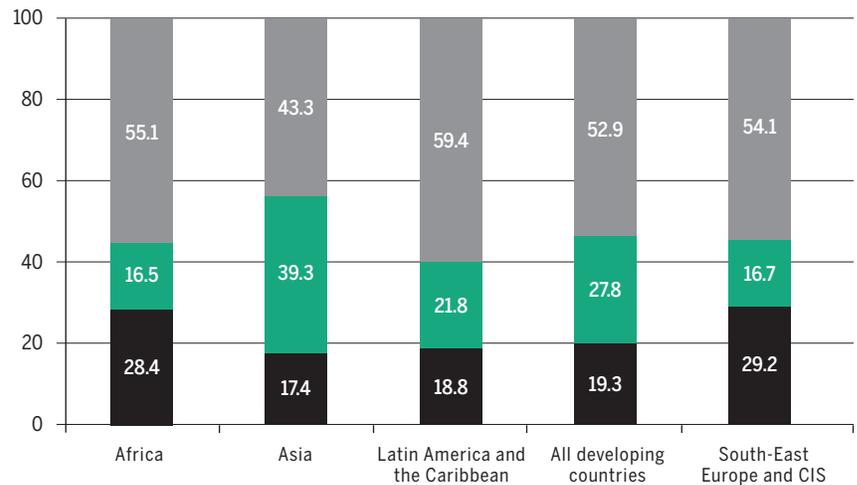
- Operation of passenger transport services (e.g. bus operators, taxis, and paratransit)
- Operation of freight transport services (e.g. logistic companies)

The financial resources required for the above aspects are equivalent to, or in many cases larger than, those provided publicly with differences arising from e.g. the ownership structure of public utilities.⁹

Focusing on infrastructure alone, UNCTAD (2008) estimates that in developing countries, roughly one third of investments in transport infrastructure is from domestic private sources (see Figure 7).

Figure 7: Transport infrastructure investment commitments by source (1996–2006)
UNCTAD, 2008

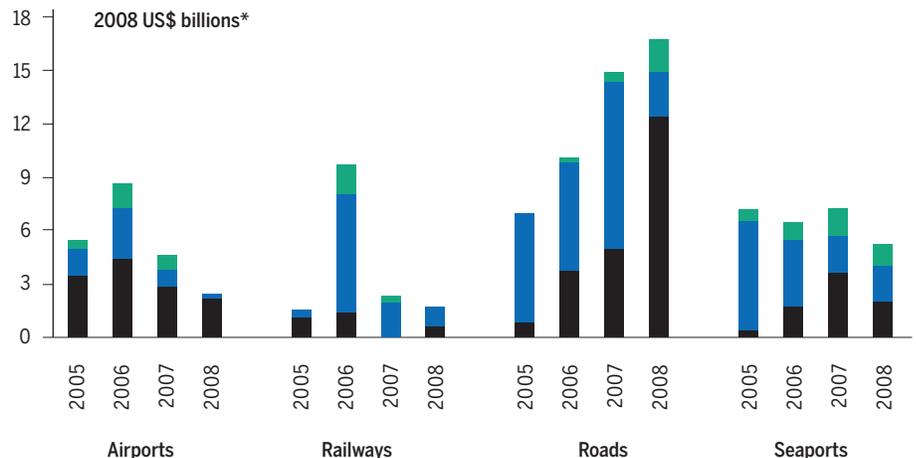
■ Foreign
■ Domestic private
■ Domestic public



The large contributions of the private sector currently mirror the trends described for public financial flows (both national and international), and are directed mainly at supporting private motorised transport. Observing the investment commitments with private participation in recent years (Figure 8), it is clear that roads received a large and growing amount of private investment in developing countries.

Figure 8: Transport investment commitments with private participation reaching closure in developing countries, by subsector, 2005-08
WORLD BANK AND PPIAF, 2009

■ 1st semester
■ 2nd semester
■ 3rd semester



Climate funds and mechanisms

Climate finance, whose main purpose is to provide resources to support climate mitigation (or adaptation) actions, has grown rapidly over the past decade. Most of these instruments can be classified as either:

- Climate Funds – funded by voluntary contributions from member countries, provide financial resources (in the form of grants or concessional loans) for capacity building, technology transfer or investments in activities contributing to the mitigation of and adaptation to climate change. Examples of these funds are the Global Environment Facility (GEF) Trust Fund and the Climate Investment Funds (CIF).
- Carbon market mechanisms – It channels an incentive to reduce GHG emissions by means of creating a market for emissions allowances and credits. The carbon market channels financial resources to low-carbon investments through, inter alia, project-based mechanisms such as the CDM and joint implementation (JI). The allocation of emission rights and the ensuing financial flows are enabled by trading schemes like the European Union Emissions Trading Scheme (EU-ETS).¹⁰

These instruments generally have been limited in their support for sustainable transport, due first to climate instruments that as a whole have been very limited in scale (reflecting the level of commitment by donor countries and the limited size/scope of carbon markets).

Second, they have been associated with difficulties in providing practical levels of access to resources owing to the stringent requirements in proving additionality and calculating incremental costs¹¹ of the proposed actions (See boxes below on GEF and CDM).

Figure 9: Trends in GEF interventions in the transport sector
GEF, 2009

BOX 3: THE GLOBAL ENVIRONMENT FACILITY

A representative climate fund is the Global Environmental Facility (GEF) Trust Fund, the financial mechanism of the UNFCCC. According to its own figures, the GEF has mobilised a total of US\$2,605.80 million for transport projects over the last 20 years (US\$185.23 million of direct finance matched by US\$2,420.57 million in co-financing as of April 2009) (GEF, 2009).

As shown in the figure below, the GEF is increasingly supportive of comprehensive transport strategies as it moves away from solely technological solutions used in early years.

Nevertheless, there are significant barriers associated with the GEF, such as the difficulty in calculating the incremental cost of mitigation actions (which is a requirement to access GEF funding)

as well as the transaction costs associated with the project planning and approval process.

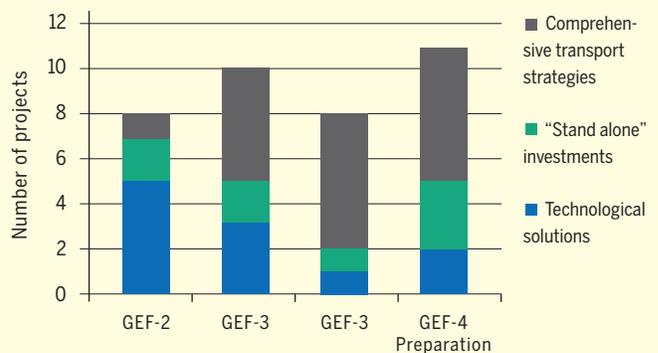


Table 2 below summarises the existing climate funds and market mechanisms, and their relative contribution to low-carbon sustainable transport.

Table 2: Current climate funding mechanisms and their relation to transport

ADAPTED FROM: NERETIN, L., DALKMANN, H. AND BINSTED, A., 2010

	Instrument	What does it support?					Example
		Capacity building	Policy support	Innovative technologies and practices	Transport infrastructure	Public awareness	
Kyoto mechanisms	CDM*			○	○		<ul style="list-style-type: none"> • BRT in Bogota • Regenerative braking on the Delhi Metro
	JI			○	○		<ul style="list-style-type: none"> • None to date
	Emissions trading						<ul style="list-style-type: none"> • None to date
Multilateral	GEF	○	○	○	○	○	<ul style="list-style-type: none"> • Fuel cell buses in China and Brazil • BRT and pedestrian improvements in e.g. Jakarta and Mexico City • Modal shift policy in Botswana
	Clean Technology Fund*	○	○	○	○	○	<ul style="list-style-type: none"> • BRT schemes in e.g. Egypt, Morocco, Mexico, Thailand and Philippines
	Clean Energy Financing Partnership Facility (ADB)	○	○	○	○		<ul style="list-style-type: none"> • Energy Efficiency Improvement in the Railway Sector in China
Bilateral	Japan Cool Earth Partnership				○	○	<ul style="list-style-type: none"> • Climate Change Program Loan for Indonesia (transport component unknown)
	German International Climate Initiative	○	○	○	○		<ul style="list-style-type: none"> • Mobility management in Lviv, Ukraine • Supporting a study by the Center for Clean Air Policy on NAMAs in the transport sector.

*See Figure 2 for a rough comparison of amounts, against other financial flows.

BOX 4: PROMOTING BUS RAPID TRANSIT (BRT) THROUGH THE CDM

The successful application of CDM to the transport sector has so far been limited to only two projects (with 24 more in the pipeline as of May, 2010). As noted in Sanchez et al (2008), this is due mainly to the difficulty of developing methodologies and collecting data to measure the reductions in greenhouse gas emissions from transport projects and to meet the additionality criteria.

A notable example of the successful application of CDM in the transport sector is Bogota's TransMilenio Bus Rapid Transit (BRT) system (phases II – IV) scheme. The system consists of;

- Dedicated bus lanes, new bus-stations and integration stations ensuring smooth transfers to feeder lines (continued)

Pricing practices

The previous four sections highlight how current financing patterns create a “supply” of unsustainable transport patterns. Yet, this only provides half of the story on the development of unsustainable transport patterns. This section explores pricing which will be shown to be a major driver (amongst others) for the “demand” for unsustainable transport.

The importance of efficient pricing has long been argued, whereby transport prices should include external costs imposed on society through congestion, accidents, infrastructure wear and tear, air pollution, noise and climate change (World Bank 2001, Button 1993) Despite this, most transport activities remain underpriced. For example:

- Fossil fuels are subsidised, leading to excessive use.
- Infrastructure, and to some extent vehicles, are not charged at the point of use, leading to irrational decisions on when/how much to use them.
- The price for vehicle purchase, ownership and use are not linked to their environmental and social consequences.

Pricing instruments, such as road user-charges, parking charges, distance-based insurance, vehicle and fuel taxes that can be designed to reflect at least some of the external costs onto the users, are seldom used, or their introduction is met with public opposition, particularly from those who perceive possible financial losses from their introduction. The same applies to regulatory instruments such as vehicle fuel efficiency standards.

As a result, private motorised transport remains cheap for users but inflicts large societal costs, some of which will be borne by future generations.

**Unsustainable transport;
Cheap for users, expensive to society.**

PROMOTING BUS RAPID TRANSIT (BRT) THROUGH THE CDM (CONTINUED)

- Modern bus technology (GPS equipped, Euro II/III engines, capacity of 160 persons, platform-level access, room for disabled persons)
- An operational fleet centre which manages bus dispatch and passenger information
- A pre-board ticketing using magnetic ticketing system that streamlines the boarding process.

The project reduced approximately 80,000 tonnes CO₂ for example in 2009. More than 134 million extra passengers were

transported due to the CDM scheme, bringing the total to up to nearly 450 million passengers across the entire network in the year 2009 (Gruetter et al, 2010).

To replicate such successful cases across the world, efforts could be placed in:

- Ensuring that new opportunities in CDM (including the move towards a programmatic approach) are fully utilised, to scale up investments from the CDM into transport, and
- Contributing to the development of new CDM rules under the Post-2012 framework which are fully “transport compatible”.

BOX 5: THE CLEAN TECHNOLOGY FUND SUPPORTING HIGH QUALITY PUBLIC TRANSPORT IN MEXICO



The World Bank administered Climate Investment Funds (CIF), comprised of the Clean Technology Fund (CTF) and Strategic Climate Fund (SCF), are “a collaborative effort among the Multilateral Development Banks (MDBs) and countries to bridge

the financing and learning gap between now and a Post-2012 global climate change agreement” (CIF, 2010). In 2008, donors gathered to pledge over US\$6.1 billion in support of the CIF. The CIF contains a sunset clause which enables an end to funding once a new financial architecture has become effective under the UNFCCC regime.

Of these, the CTF is increasingly mobilised to support sustainable, low-carbon transport in developing countries, including Mexico. There, a CTF co-financed programme is seeking to deploy 20 bus rapid transit (BRT) corridors, light rails and other efficient transport modes, combined with low-carbon vehicles (such as hybrid, articulated, and high capacity vehicles), scrapping displaced rolling stock, and implementing transport integration/transfer systems. The expected GHG emissions savings are roughly two million tons of CO₂ per annum (CIF, 2009).

^Figure 10: Public transport in Mexico: Needs renewal

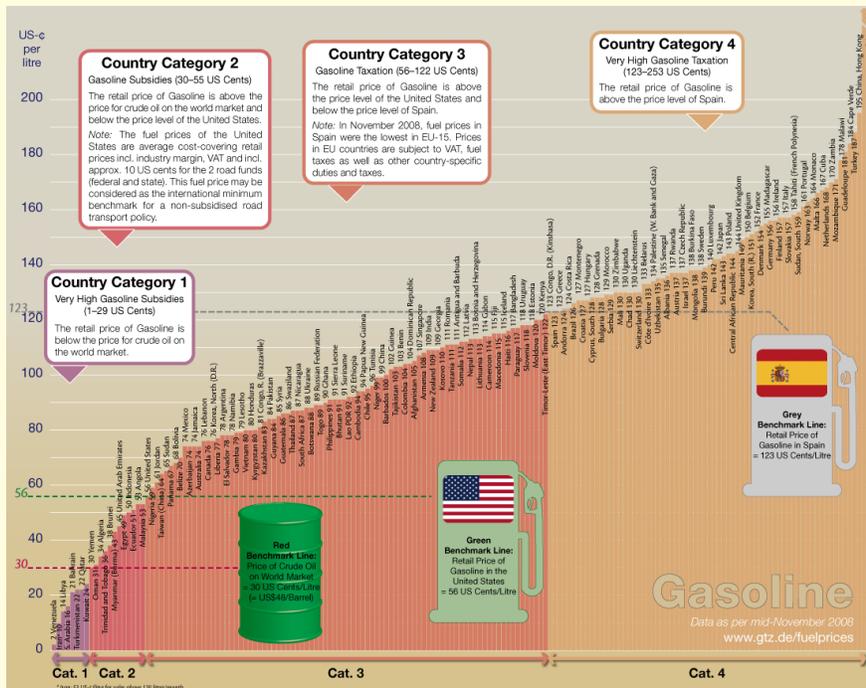
^Figure 11: Retail prices of gasoline in US cents per litre
GTZ, 2009 BASED ON NOV 2008 FIGURES

BOX 6: SUBSIDIES ON ENERGY

Energy sources, and in particular fossil fuels, currently receive global public subsidies in the order of \$300 billion (UNEP, 2008) to \$740 billion (IMF, 2010b) per annum. This is reflected in the wide discrepancy of fuel prices seen around the world (See fig 11). Although some subsidies are provided with the intention

of supporting the poor (e.g. in rural communities), they distort incentives for individuals and industry to invest in energy-efficient technologies and change consumption behaviour. Furthermore, subsidies lead to deficits in the national budget and the destabilisation of the macroeconomic performance of entire countries and regions, particularly in developing countries. For example, the oil subsidies in Indonesia and Yemen are larger than their health and education budgets combined. Fuel subsidies can worsen inequality because the greatest beneficiaries are those who consume the most and usually belong to the highest income groups.

Despite these negative aspects, energy subsidies are popular measures the reform of which is often met with opposition. To overcome these hurdles, UNEP (2008) notes that reforms can be introduced in a gradual, programmed way to reduce their effects by coupling them with compensating measures. This could include targeted tax relief on staple food (e.g. rice), or pure cash handouts. Politicians also need to communicate the benefits of reform in a transparent manner.



Summary of the current situation

The key trends and drivers that affect the financial flows described in this section are summarised in Table 3 below.

	Key Trends	Drivers of trends
Domestic public finance	<ul style="list-style-type: none"> • Transport responsible for 2 to 13% of all public expenditure in a typical country. • National governments continue to be dominant source of funding • Majority of funding allocated to road building 	<ul style="list-style-type: none"> • Road infrastructure perceived as driver of economic growth • Road infrastructure considered to be a source of employment (i.e. for the construction industry) • Vehicle manufacturing regarded as strategic industry • Public policy often formulated by rich members of society • Strong consumer demand for private motorised vehicles (motorcycles and cars) due to rising income levels and availability of credit.
International public flows	<ul style="list-style-type: none"> • Transport is a key target sector for MDBs and bilateral donors • Majority of transport lending goes to the road sector • Export credits used to support aviation and maritime transport 	<ul style="list-style-type: none"> • Focus on (export led) economic growth and infrastructure provision for poverty reduction • Lack of appetite from recipient countries for sustainable transport
Climate finance	<ul style="list-style-type: none"> • Limited scale of climate funds • Limited applicability of CDM in transport 	<ul style="list-style-type: none"> • Shortage of overall resources for climate change mitigation • Difficulty in designing methodologies and eligible projects
Private flows	<ul style="list-style-type: none"> • Directed towards goods, services and infrastructure which support the motorisation model of transport development 	<ul style="list-style-type: none"> • Exclusion of environmental and social costs from market prices • Investments in road building and motor vehicle manufacturing more lucrative to the investor compared to alternative, sustainable modes

Table 3: Summary of current trends and drivers for the major financial flows affecting transport

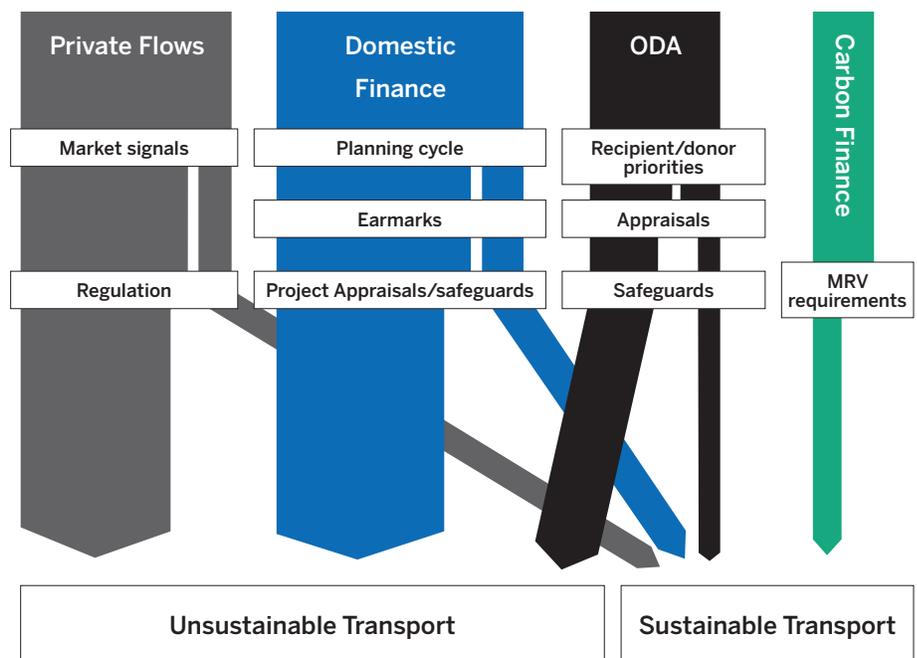
The current situation is summarised by Figure 12 overleaf, which highlights that:

- Domestic public finance is mainly used to build and maintain infrastructure to cater for increasing levels of motorised traffic. Budgets are often rigid and difficult to reform due to the prevalence of earmarks. Project appraisal frameworks usually follow the mainstream practice of valuing time and vehicle cost savings as the two main benefits of transport schemes, whereas climate and other environmental impacts are generally given lower priority. Furthermore, a significant amount of public finance is spent on environmentally harmful subsidies, most notably on fossil fuels.
- Official Development Assistance (ODA) flows are directed towards development based on the motorisation model, reflecting both the requests of recipient countries as well as the menu of technical assistance being

provided by donor organisations. Financing is particularly directed towards the construction of roads, as a result of strategic planning, the current appraisal framework which generally only values time and vehicle operating cost savings, and the inadequate safeguards to halt environmentally harmful projects from being implemented.

- Private flows are also directed towards the development of goods, services and infrastructure that support the motorisation model of transport development, e.g. motor vehicle manufacturing. One reason is the exclusion of environmental and social costs in the pricing of transport services in most countries, distorting market signals. Regulatory measures, for example emission standards for new vehicles, are currently inadequate in scale and scope to provide a strong signal to the contrary.
- Carbon finance is generally limited in scale and access to these resources is further reduced by the requirements placed upon the transport sector, i.e. a narrow approach to measuring the mitigation potential of policy actions (and the associated incremental costs), together with the lack of data to allow the measurement, reporting and verification of mitigation actions. Carbon crediting mechanisms such as the Clean Development Mechanism (CDM) suffer from large transaction costs due to the dispersed nature of transport emissions.

Figure 12: Current patterns of financial flows



As a result, resources targeted at sustainable transport policies, programmes and projects are generally a fraction of those for traditional (unsustainable) transport. The following chapters will describe how these flows can be redirected towards more sustainable patterns.

Principles for the paradigm shift

Need for a strong vision

The previous chapter highlighted the pattern of current financial flows which largely target a motorisation model of development. In developing a new financial framework, it is important to begin by acknowledging the growing consensus on the overall policy paradigm (or strong vision) that allows development of more sustainable forms of transport.

Here, the Avoid, Shift and Improve (ASI) approach to climate change mitigation, as introduced in Dalkmann and Brannigan (2007) and endorsed in the Common Policy Framework on Transport and Climate Change (Leather et al, 2009), will be referred to as the basis of the new paradigm. This approach calls for;

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

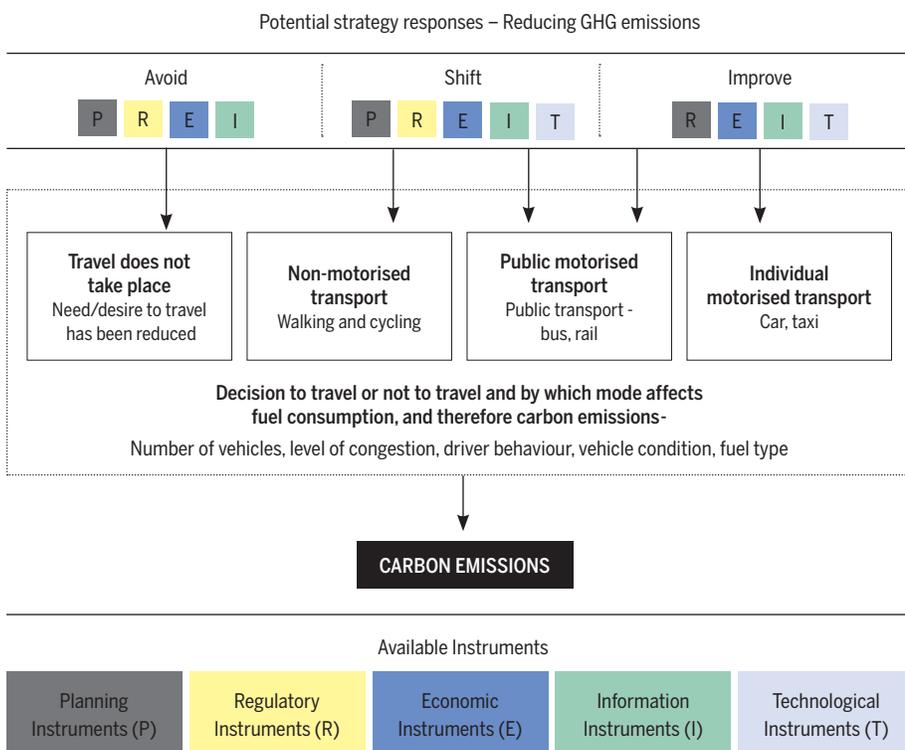


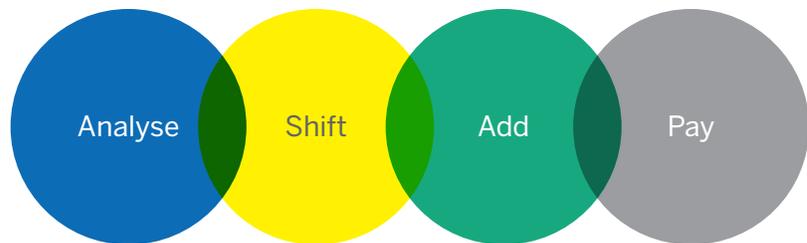
Figure 13: Strategies to achieve low carbon mobility
 DALKMANN AND BRANNIGAN, 2007

The ASI approach has consequently been endorsed by the Partnership on Sustainable Low-Carbon Transport (SLoCaT)¹² and UNEP in an official submission to the UNFCCC (UNEP, 2009).

The implementation of an “Avoid-Shift-Improve” approach would initially reduce the growth of GHG emissions in developing countries and ultimately work to reverse it. Importantly, this approach will contribute to the overall sustainability of the transport system by e.g. improving air quality, enhancing accessibility, reducing accidents and curbing traffic congestion. Adopting such a co-benefit strategy rather than pursuing these objectives in isolation is thought to be highly cost effective, especially in countries where resources are scarce.

Developing genuinely sustainable transport systems today will bring long-term positive effects, especially as fossil fuels become scarcer and the need to reduce carbon increases.

Figure 14: Elements of the ASAP strategy



Financing the vision ASAP: Analyse, Shift, Add, Pay

In pursuit of the above vision, the design of the financing framework needs to be fully integrated and made to support the Avoid-Shift-Improve paradigm. The approach suggested in this White Paper is structured as a summation of four closely related actions, namely to;

- ANALYSE the impacts of financing decisions taken by relevant stakeholders on sustainability;
- SHIFT existing resources towards a sustainable direction;
- ADD / increase funding for those areas where resources are lacking; and
- PAY for the full costs of transport including environmental depreciation.

These elements, as well as the relationship between these components, are detailed in the following sections.

Analysing the impacts of financing decisions

The first element of the ASAP strategy entails a move towards a more holistic approach to analysing the implications of financing decisions, including those on climate change.

As highlighted in the previous chapter, the current decision-making process (for all but a few financial flows) fails to take into account the full economic, social, and environmental (including climate change related impacts) consequences of policies, programmes, and projects.

The necessity for reform is present at all levels of the policy-making process from needs assessment, formulation, implementation, monitoring to evaluation and feedback. For each of these stages, key questions such as those in the following figure need to be asked.

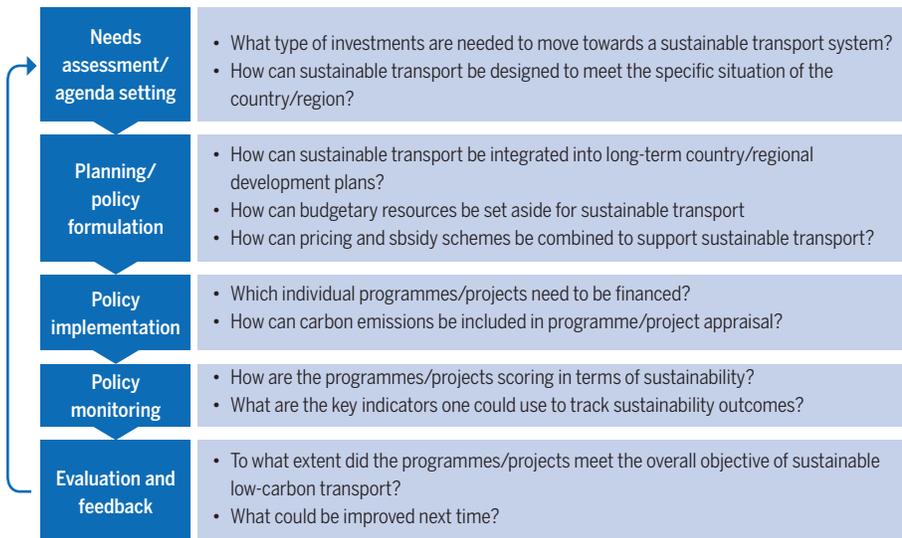


Figure 15: Analysing the impact of financing decisions

Needless to say, the ways in which policy decisions effect carbon and sustainability in general can be built into the above cycle and is dependent on the incumbent processes of each country/local authority, and for each financial flow.

Shifting resources towards a sustainable direction

Changes in the way analyses and assessments are conducted in light of the aforementioned paradigm shift leads to the next element of the ASAP strategy,

Table 4 (below): Levels of evidence available for transport impacts in the UK Context MODIFIED FROM DFT, 2009

THE LEVEL OF UNCERTAINTY FOR THE VARIOUS COST/BENEFIT CATEGORIES IN THE TABLE ABOVE ARE LIKELY TO BE SIGNIFICANTLY AMPLIFIED IN THE DEVELOPING COUNTRY CONTEXT.

BOX 7: HOLISTICALLY MEASURING AND COMMUNICATING THE MITIGATION COSTS OF TRANSPORT MEASURES

Cost effectiveness is a key consideration in the design of policies for climate change mitigation. Whilst respecting other important criteria reflecting development priorities, resources are ideally focused on measures where the marginal costs of carbon abatement are lowest. In this context, marginal abatement cost curves (MACCs) are often used to rank various policy/technology interventions in terms of their costs in abating one unit of carbon.

Existing work on MACCs have often labelled transport as an “expensive” sector for mitigation actions to take place (see McKinsey, 2009). This is often a result of interventions in the transport sector being assumed to be limited to (continued)

Impacts included in value for money assessment			
Qualitative/quantitative assessment		Monetised values (NATA BCR)	
Areas for development	Some valuation evidence		
<ul style="list-style-type: none"> • Townscape • Water environment • Accessibility • Social inclusion • Integration • Biodiversity • Heritage 	<ul style="list-style-type: none"> • Wider economic benefits* • Landscape • Rotatability • Air quality • Journey ambience • Regeneration 	<ul style="list-style-type: none"> • Risk of death/injury • Noise • Carbon • Physical fitness 	<ul style="list-style-type: none"> • Time savings • Operating costs • Private sector impacts • Cost to the public purse

namely to shift resources towards a sustainable direction. This would occur as a result of the approval of more policies, programmes and projects supporting sustainable transport, relative to the status quo.

Central to the shift is changing how programmes and projects are appraised, as this determines to a large degree what receives funding.

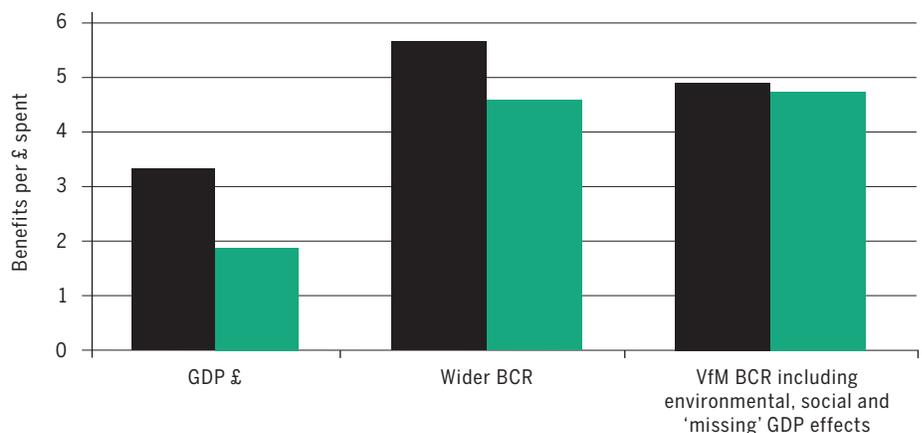
The output from cost-benefit analysis methodologies are highly dependent on the values attached to the various benefits, such as time savings, and how the impacts are accounted for. For example, a recent review of transport appraisal in the UK shows that the relative benefit of a basket of road projects against another basket of public transport projects diminishes significantly based on whether so-called wider economic effects as well as social and environmental effects are included. See Figure 16 (Eddington, 2006). Whilst this example is from a developed country context, the importance of including social and environmental costs in appraisal is common to developing countries as well.

The results of economic appraisals also depend heavily on what kind of pricing policy is assumed. Eddington (2006) further highlights that the introduction

Figure 16: The relative benefits of road schemes decline when environmental and social costs are included¹³

EDDINGTON (2006)

■ Road
■ Bus and interchange schemes



HOLISTICALLY MEASURING AND COMMUNICATING THE MITIGATION COSTS OF TRANSPORT MEASURES (CONT.)

expensive, technological options, for example the diffusion of hybrid or electric vehicles. Another problem in transport is the cost of "rebound effects," where improved fuel efficiency leads to reduced travel costs that in turn can encourage further growth in traffic unless countered by pricing mechanisms (Barker et al, 2009). This has led to the relatively low level of political priority given to mitigation efforts in this sector, in both developed and developing countries.

There is however a growing consensus amongst transport and climate professionals, as noted in the Bellagio Declaration on Transport and Climate Change (2009), that current MACCs are not reflective of the wide range of policy interventions that would allow significant mitigation in this sector to occur, in particular those associated with inducing behavioural changes such as the

reduction in the number (or distance) of trips.

What is therefore required is a fuller understanding of the wide range of policy interventions relevant to mitigating transport emissions, encompassing the Avoid, Shift and Improve strategies.

Furthermore, there is a danger in limiting the analysis of cost effectiveness to carbon. Sustainable transport policies often bring about large co-benefits, including the mitigation of air pollution, reduced congestion, improved street safety, reduced deforestation and protection of biodiversity. Efforts are required to further improve the understanding of the costs and benefits of transport impacts, particularly in areas in which methodologies and data are currently scarce. The figure below provides an example of how a range of impacts are taken into account in the UK "New Approach to Transport Appraisal" (NATA).

of a well targeted national road pricing scheme could reduce congestion by roughly 50% below the baseline in 2025, and reduce the economic case for building additional strategic roads by approximately 80%¹⁴.

The same study also highlights that smaller projects (with lower environmental impact) can possess much larger ‘Value for Money’ — VfM compared to larger infrastructure projects— See Figure 17. It stresses that “improving the attractiveness of walking and cycling, e.g. by creating or upgrading routes, can provide strong returns with wider Benefit to Cost Ratios (BCR)s sometimes over 10.” (Eddington, 2006).

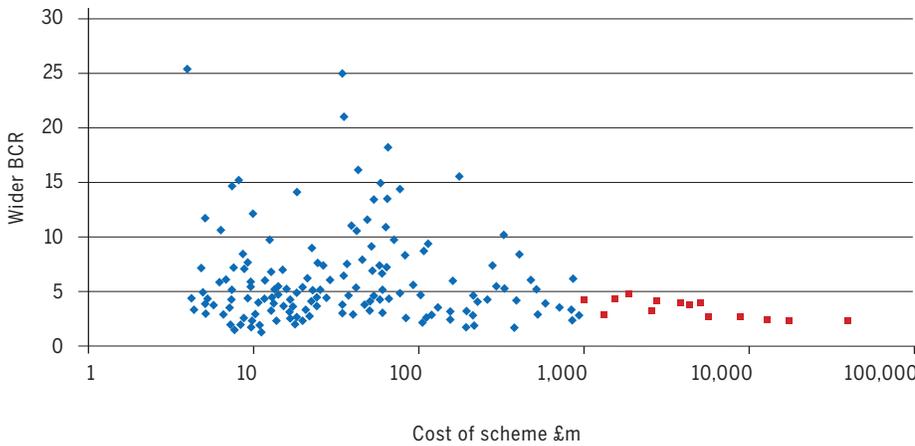


Figure 17: Smaller projects often provide larger social returns
EDDINGTON, 2006

◆ Schemes costing < £1billion
■ Schemes costing > £1billion

Such examples highlight how a wider assessment of costs and benefits would facilitate the shift of resources towards sustainable transport. Public transport systems, and in particular bus rapid transit systems capable of providing much larger levels of mobility per unit of resources spent are also likely to benefit significantly through a more holistic assessment framework (see for example Levinson et al, 2003).

Adding resources in strategic areas

In the context of a developing country, the shift in the transport investment portfolio is likely to occur in the context of increasing levels of investments in transport as a whole. In other words, the question is not only about shifting existing resources, but ensuring that any additional resources are channelled towards elements that support sustainable transport, particularly in areas where resources are currently lacking.

Furthermore, there is a need to support existing good practice in low-carbon, sustainable transport by scaling up investments in those areas.

These would include:

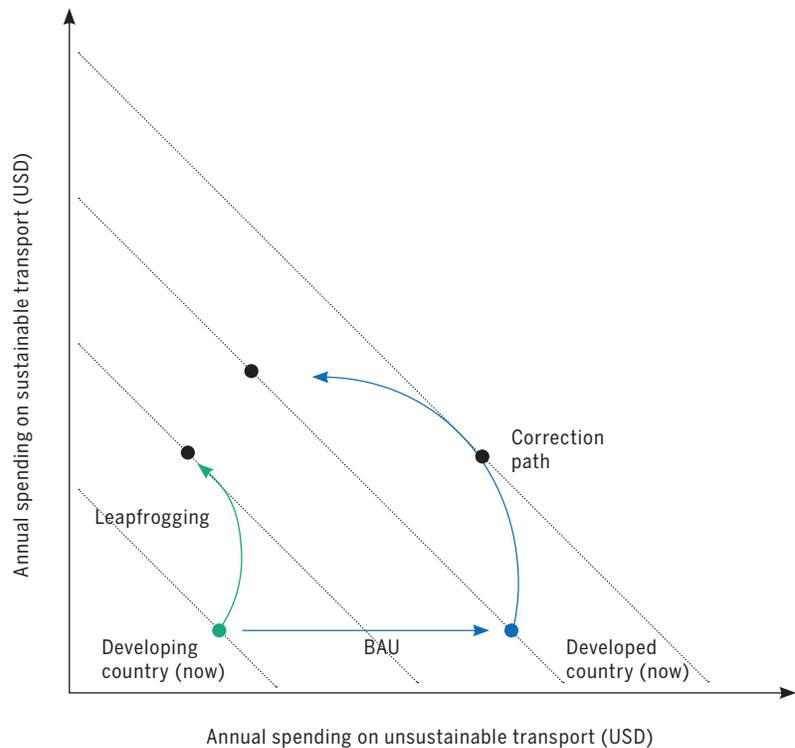
- Institutional capacity building
- Operation of sustainable, low-carbon transport services (e.g. bus rapid transit)
- Development of affordable, clean vehicles (e.g. bicycles)

- Construction and maintenance of sustainable transport infrastructure

This notion is depicted in Figure 18 below, which shows how an approach based on the Avoid-Shift-Improve strategy will provide increased levels of resources to be spent on sustainable (as opposed to conventional, unsustainable) forms of transport. This is in contrast to business as usual, whereby developing countries continue to develop their transport infrastructure in much the same way that current industrialised countries have done so in the last few decades.¹⁵

Implicit in the diagram is that such industrialised countries would also benefit from shifting financial resources towards sustainable transport – however developing countries have the option of “leapfrogging” directly towards the desirable situation and at significantly less cost, without committing the same mistakes of industrialised countries.

Figure 18: Shifting and adding resources for sustainable transport



Paying for the full costs of transport

The fourth pillar of the ASAP strategy regards pricing of transport activities. A subject in its own right, pricing directly affects the way financing of sustainable transport systems translate into actual benefits, mainly through:

- Incentivising behavioural change of individuals and allowing sustainable patterns of transport to become more financially attractive relative to one based on private motorised transport.
- Providing a strong signal to the private sector to invest and innovate in sustainable transport.

- Raising the revenue required for additional investments to be made in sustainable transport.

From this perspective, it is imperative that:

- Transport is priced directly¹⁶ at the point of travel, with a variable pricing regime that reflects all external costs (including congestion, accidents, infrastructure wear and tear, climate change, noise, and air pollution externalities) to the user of the transport service (see Table 5 below).
- Harmful subsidies on e.g. fossil fuels and motor vehicles are removed.
- Pricing instruments are combined with appropriate regulation, wherever prices are not sufficient on their own to provide enough incentives to shift behaviour.

Externality	Instruments
Infrastructure operation, maintenance and depreciation	Infrastructure charges, road pricing
Air Pollution (and associated health impacts)	Regulations, environmental charges, road pricing, emission zone restrictions (e.g. in Germany)
Noise	Regulations, taxes on vehicle use targeted at noisiest vehicles
Climate Change	Carbon tax, road pricing, fuel duty, vehicle taxes, airport tax
Congestion	Road pricing, congestion and parking charges

Table 5: Road transport externalities and measures for internalisation
MODIFIED FROM SAKAMOTO, 2006

The challenge for developing countries is to ensure that taxation / subsidy structures around vehicles and fuels and investment decisions for infrastructure reflect the full external costs.

The effective pricing of transport services allows the other pillars of the ASAP strategy to become fully effective, as shown in Figure 19 below.

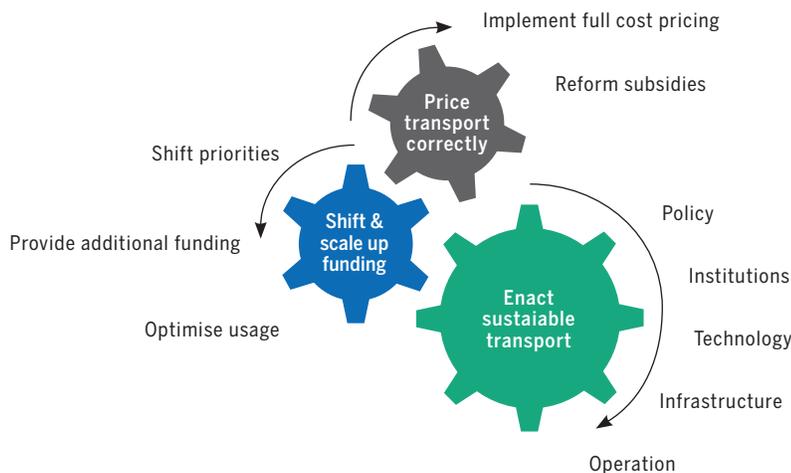


Figure 19: Pricing and financing: the cogwheels of change
SAKAMOTO, IN ADB, 2010

Realising the ASAP action agenda

This chapter provides a detailed account of the roles of key stakeholders (including developed/developing country governments, development agencies, export credit agencies, climate finance institutions, the private sector and NGOs/academia) in enacting the ASAP strategy, differentiating between actions which need to be taken in the short- (next two years) and long-term (more than two years). Implicit in this is the functioning of the Post-2012 climate regime in the year 2012.

Developing and developed country governments (national and local)

National and local governments will play a central role in enacting the ASAP strategy, as they ultimately bear the responsibilities for providing sustainable transport for the benefit of the citizens they serve.

Not only do they have direct control over their domestic spending, they also can influence international flows, e.g. through the types of requests submitted for ODA as well as support for Nationally Appropriate Mitigation Actions (see “UNFCCC and other climate finance institutions/mechanisms”, page 34).

As stressed in the previous chapter, governments also can set market conditions to guide the actions of the private sector.

The above points combined, it is thought that national and local governments are a central player in enacting the ASAP strategy, and that the successful transition towards a sustainable transport paradigm would be impossible without their commitment to change.

Their roles, for each of the ASAP elements, include those presented in Table 6 below.

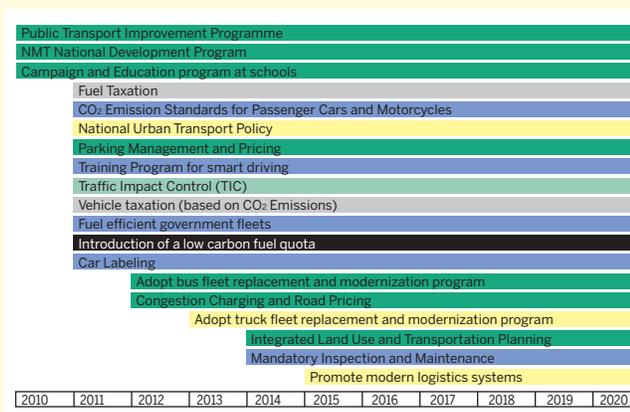
Figure 20: The Indonesian Transport Sector Roadmap

BAPPENAS, 2010

Type of Measure:

- Urban Transport Improvement
- Freight Transport
- Efficiency Technology
- General
- Renewable

BOX 8: LINKING NATIONAL DEVELOPMENT PLANS AND BUDGETS WITH CLIMATE CHANGE ACTIONS: INDONESIA'S CLIMATE CHANGE SECTORAL ROADMAP



Within ongoing efforts to act on climate change mitigation and adaptation, the Indonesian government has developed a

self-proclaimed “Indonesia Climate Change Sectoral Roadmap (ICCSR)” which provides inputs for the country’s five-year medium-term development plans (serving to outline the nation’s future budgets) up to the year 2030. The plan focuses on key sectors, including forestry, energy, industry, agriculture, transportation, coastal area, water, waste and health (BAPPENAS, 2010).

The transport sector, proposes a number of programmes including a national urban transport policy, increasing freight transport efficiency, improving fuel efficiency, and increasing the use of renewable energy, and links these to the Avoid, Shift and Improve paradigm. Indicative costs of these actions are also given, to assist in budgetary planning.

The ICCSR provides an example of how developing countries can work towards shifting budgetary priorities to those that support sustainable, low-carbon transport in a holistic manner.

Table 6: Actions required from developing and developed country governments

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> • Start to incorporate sustainability criteria under all stages of the policy-making cycle, including long-term country development plans, annual budgets, project appraisal and evaluation. • Develop the necessary databases, methodologies and guidelines to ensure the accurate monitoring of transport developments, and their full environmental and social impacts. • Revisit currently planned schemes and assess their contributions to sustainable transport. • Identify "quick wins"—low cost high value for money schemes that deliver results in the short term, e.g. bus rapid transit (BRT) systems. • Assess the implications of present pricing structures and subsidies, and communicate to the public the benefits of reform. 	<ul style="list-style-type: none"> • Maintain and improve the databases, methodologies and guidelines to ensure the accurate monitoring of transport developments, and their full environmental and social impacts. • Mainstream sustainability as a core objective of national/local transport policy, and restructure relevant institutions to cater for this objective. • Continue to develop/improve BRT and other cost effective means of sustainable transport.
Shift	<ul style="list-style-type: none"> • Ensure a shift in budgetary priorities towards sustainable low-carbon transport. • Developing countries to shift requests to donors for carbon intensive modes of transport (e.g. inter-city highways) to low-carbon, sustainable modes. 	
Add	<ul style="list-style-type: none"> • Potentially earmark part of the extra revenue generated from pricing mechanisms to support elements of sustainable transport • Developing countries to initiate requests for international financial support in sustainable transport, as part of Nationally Appropriate Mitigation Actions (NAMAs) funded by rich countries. 	<ul style="list-style-type: none"> • All countries ensure that all future increases in the transport budget are fully geared towards supporting sustainable transport. • Developing countries to continuously include sustainable transport as part of their NAMAs.
Pay	<ul style="list-style-type: none"> • Initiate the deployment of mechanisms such as parking demand management, distance-based insurance, road pricing, and vehicle taxation. • Produce a concrete plan to gradually implement fuel subsidy reform. 	<ul style="list-style-type: none"> • Ensure that land, housing and infrastructure developers carry the full costs of transport which they generate. • Scale up the implementation of mechanisms such as parking demand management, distance-based insurance, road pricing, and vehicle taxation. • Carry out fuel subsidy reform.

Development agencies

International donors, including multilateral development banks and bilateral development agencies, can play a significant role in the way in which transport patterns in developing countries are formed.

By aligning their grant support/lending criteria with sustainability objectives, they can catalyse major changes to the way domestic priorities are set.

Furthermore, regional intergovernmental forums such as the Association of South East Asian Nations (ASEAN), South Asia Cooperative Environment Programme (SACEP), African Union (AU) and Union of South American Nations (USAN) can provide platforms for political dialogue and coordination.

Details of the required actions from such institutions are summarised in Table 7 below.

Table 7: Actions required from development agencies

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> Incorporate sustainability under all levels of transport support, starting from Country Assistance Strategies, project appraisal, safeguard policies to ODA evaluation guidelines. Evaluate the GHG impacts and carbon intensity of investments and technical assistance. 	<ul style="list-style-type: none"> Harmonise the tools, methodologies and approaches of development agencies, and provide support to developing countries in a fully concerted manner, and in coordination with the priorities of the recipient countries. Continue to develop and implement mechanisms for accounting and reporting investments in sustainable transport.
Shift	<ul style="list-style-type: none"> Make significant shifts in the grant support/lending portfolio, to focus on sustainable low-carbon transport. Provide technical assistance in sustainable transport, including data collection, sustainable transport technologies and infrastructure. Set management goals to cut GHG intensity and impacts of investments at portfolio/project level. 	<ul style="list-style-type: none"> Further scale up investments in sustainable low-carbon transport. Develop financing packages/approaches that would catalyse investments by the private sector in sustainable transport.
Add	<ul style="list-style-type: none"> Earmark any extra increases in transport-related development assistance to sustainable transport policies/programmes/projects. Create new or augment existing institutional structures that can help facilitate the financing of sustainable low carbon transport Mobilise additional resources for climate finance and assist developing countries to access these resources 	
Pay	<ul style="list-style-type: none"> Provide capacity building, data collection, and technology support for developing countries to implement strong pricing policies and environmental regulation. Strengthen the foundation for transport demand management such as vehicle regulations and traffic demand management (Bus Rapid Transit/non-motorised transport/road pricing), smart logistics and supply chain management through both grants and loans. 	

BOX 9: OVERCOMING POLITICAL BARRIERS IN CHANGING BUDGETARY PRIORITIES

Changes in a country’s budget programme are more often than not met with sizable opposition, particularly from the beneficiaries of the current regime.

A frequently quoted example is the influence of the construction industry on government transport policy. This is often seen in the explicit form of corruption (endemic in many developing countries, but also in developed countries), where public officials are bribed by private firms to ensure continued and increased levels of spending in what are often “white elephants”, or “bridges to nowhere.”

Political and bureaucratic impetus is another factor that should be overcome for the shift towards sustainable transport patterns to occur. Whether intended or not, budgetary practices often become inflexible, as demonstrated through the existence of various earmarks in public spending.

Finally, effort needs to be taken to ensure that the voting public and all stakeholders fully understand the long-term consequences of financing decisions taken by their governments.

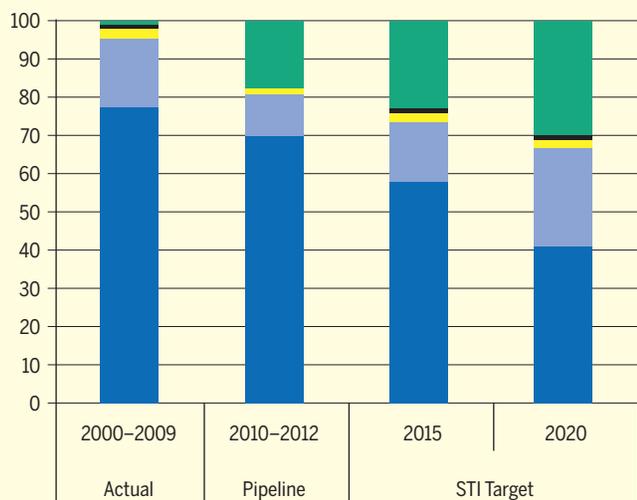
The benefits of financing sustainable transport need to be communicated to the public in a tangible manner, for example through the usage of revenues from e.g. road pricing to improve public transport. This was indeed a major factor in the success of the London Congestion Charge. Also, the development of the BRT in Bogota, Colombia was successful in large part to the city ensuring the interests of conventional bus operators by incorporating them into the new system, and sharing the dividends of the scheme.

“Innovation makes enemies of all those who prospered under the old regime, and only lukewarm support is forthcoming from those who would prosper under the new.”

– N. Machiavelli (1532)

Figure 21: ADB’s lending portfolio – now and under the Sustainable Transport Initiative (STI)
ADB, 2010

BOX 10: THE SUSTAINABLE TRANSPORT INITIATIVE OF THE ASIAN DEVELOPMENT BANK



The Asian Development Bank (ADB) has recently launched its Sustainable Transport Initiative (STI) Operational Plan, which recognises the need to mainstream aspects of sustainability in its lending portfolio, and increase support provided to its recipient countries in the areas of urban transport, climate change and energy efficiency, regional cooperation and integration, and road accidents and social sustainability.

It sets as directional targets a large relative increase in the percentage of lending towards urban transport and rail.

The STI is one example of how development agencies can shift financial support towards a more sustainable direction.

Export credit agencies

Export credit agencies are well suited to leverage private investments which can help develop infrastructure and transfer technologies relevant to low-carbon sustainable transport.

Here, export credits can be used to facilitate the diffusion of sustainable transport vehicles and infrastructure based on a thorough analysis of the sustainability impacts of the export activities concerned (see WRI, 2005).

The rail industry (e.g. manufacturers of rail carriages) in particular may be a large beneficiary of support, for example if ECAs can back purchases by national and sub-national entities in developing countries by guarantees.

Care needs to be taken not to negatively affect the indigenous development of sustainable options, e.g. by crowding out the market with artificially cheap importation of expensive and inappropriate technologies.

Table 8: Actions required from export credit agencies

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> Evaluate the impacts and intensity of investments supported by export credits and guarantees on GHG emissions. Build on and expand the work by the OECD in developing a shared "Arrangement on Officially Supported Export Credits" to incorporate environmental (and especially GHG) considerations. 	<ul style="list-style-type: none"> Build an effective international monitoring system to fully monitor the level, nature and impact of export credits on environmental sustainability.
Shift	<ul style="list-style-type: none"> Increase the provision of credit support to providers of infrastructure, vehicles and technologies which promote sustainable transport patterns. 	<ul style="list-style-type: none"> Integrate the strategy surrounding export credits with those of other international flows, and re-orientate its role as a catalyst for the diffusion of sustainable (transport) technologies.
Add	<ul style="list-style-type: none"> Initiate the provision of credit support to providers of sustainable transport infrastructure, vehicles and technologies, particularly surrounding public transport 	
Pay		

UNFCCC and other climate finance institutions/mechanisms

Climate financing instruments, which were shown in the previous section to be inadequate in both scale and scope, would need to be more widely applied to the transport sector.

Although climate financing alone would remain inadequate to solve the wider problems, it could increasingly become a useful tool in providing incentives to mayors, municipalities, and national governments, by providing a "stamp of international recognition" for their actions, and also by "tipping the scale" for the viability of some projects. For example, climate finance can help meet the

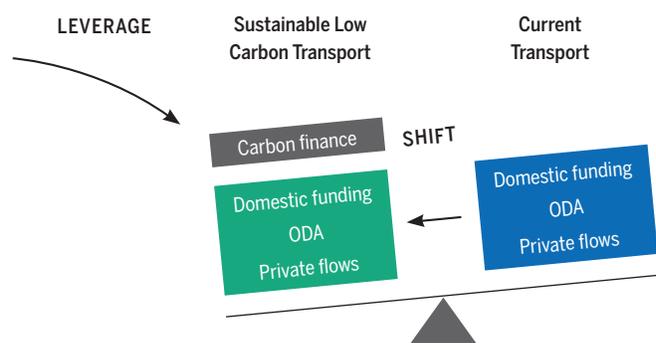
additional costs associated with the use of more efficient technologies not only related to fuels and vehicles, but also infrastructure management.

As shown through the experience of the Global Environmental Facility (GEF) and the Clean Technology Fund (CTF), climate funds would be most beneficial if they provided funding in two key areas where current support is lacking, namely:

- Capacity building – of national and local governments
- Policy support for developing and implementing sustainable transport

Through the above, climate finance may work to leverage and shift further financial resources from other flows, as depicted in Figure 22 below.

Figure 22: Carbon finance to leverage change



For this transformation to occur, institutions responsible for, or relevant to, the development and governance of climate finance mechanisms may take the steps suggested in Table 9 overleaf.

BOX 11: WHERE CLIMATE FINANCE STANDS AFTER COPENHAGEN

The future of climate finance is covered in uncertainty, particularly after the COP15 in Copenhagen which was intended to be a milestone for a new climate regime to replace the Kyoto Protocol at the end of its first commitment period in 2012.

Instead the outcome was a so-called “Copenhagen Accord”, a political, non-binding agreement negotiated among roughly 30 countries that are responsible for more than 80% of the global GHG emissions. According to Binsted et al (2010), there are two ways in which the Copenhagen Accord could provide leverage for further discussions in 2010;

- The Accord could serve as input to the Ad-hoc Working Groups (AWG-KP and AWG-LCA), whereby further negotiations within the working groups could refer to the document and the decisions agreed by heads of state.
- The Accord could become the nucleus of a new international climate policy initiative to develop climate policy outside the

UNFCCC with a limited number of countries supporting it and working under the provisions of the document.

With regards to financing, the Accord as well as draft conclusions of the AWG-LCA refer repeatedly to the need for scaled up, predictable, new, additional and adequate funding for developing countries.

Some encouragement is taken from the fact that the Accord mentions the collective commitment of developed countries “approaching” US\$30 billion for the period between 2010-2012 and growing to US\$100 billion a year in 2020 with “balanced allocation between adaptation and mitigation”. It remains to be seen, whether these commitments will be fulfilled.

Also proposed is the establishment of a Copenhagen Green Climate Fund to support projects, programmes, policies and other activities in developing countries related to mitigation. A high level panel has already been established to guide the (continued)

Table 9: Actions required from climate institutions

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> Design the Measurement – Reporting – Verification (MRV) framework (and associated methodologies and tools) for the Post-2012 framework to ensure that it is workable for the transport sector. In particular, revise the current additionality criteria as well as calculation methods for incremental costs found in representative climate funds/mechanisms, which have so far posed a significant barrier to the implementation of mitigation actions in the transport sector. Develop methodologies which would appropriately take into account the co-benefits of mitigation actions. 	<ul style="list-style-type: none"> Support the development of harmonised databases in developing countries, so as to allow accurate monitoring of transport emissions from the transport sector.
Shift	<ul style="list-style-type: none"> Ensure that existing and future climate finance instruments leverage changes in other financial flows, by targeting areas such as capacity building and policy support. 	<ul style="list-style-type: none"> Build a strong and robust global carbon market (integrating the regional carbon markets in existence) to catalyse a shift in private sector investments towards low-carbon, sustainable transport.
Add	<ul style="list-style-type: none"> Ensure that climate finance mechanisms (both existing and proposed for the Post-2012 period) are fully applicable to the transport sector. Consider the set-up of a “transport window” under the proposed Copenhagen Green Climate Fund. Consider sectoral crediting as an option to increase mitigation actions in the transport sector. Pilot Nationally Appropriate Mitigation Actions in the transport sector. 	<ul style="list-style-type: none"> Ensure that transport NAMAs are adequately matched to international (financial) support. Continue to scale up the overall amount of financing available for climate mitigation, and ensure that such resources are additional to, and not substitutes for commitments made in the form of ODA and other financial flows.
Pay	<ul style="list-style-type: none"> Link specific taxes/charges of developed countries to funding sustainable transport in developing countries. (e.g. usage of EU-ETS auction revenues) 	<ul style="list-style-type: none"> Consider a global fuel levy (e.g. for bunker fuels) whose revenue is used to finance sustainable low-carbon transport.

WHERE CLIMATE FINANCE STANDS AFTER COPENHAGEN (CONTINUED)

development of this fund, headed by the Prime Minister for the UK and Ethiopia.

Furthermore, a recent analysis of NAMA submissions by Dalkmann et al (2010) shows a growing appetite from developing countries for low-carbon transport to be supported internationally.

These encouragements are matched by the following uncertainties, in the context of the current climate negotiations;

- The unclear nature of the Copenhagen Accord, and its

impact on the overall climate negotiations leading up to the COP16 in Mexico in November 2010.

- The level and certainty of commitment by developed countries for provision of financial resources
- Details on governance of the Copenhagen Green Climate Fund, or other financial mechanisms that may result from the negotiations.

The private sector

There are primarily two ways in which the private sector (both domestic and foreign) can contribute to a sustainable transport sector, namely:

- Directly, as a provider of sustainable transport (as a manufacturer or service provider), and
- Indirectly, as an investor in sustainable transport programmes and projects.

Thus, actions by the private sector in support of sustainable transport can be catalysed through:

- Consumers generating enough demand for sustainable transport services
- The public sector creating enough incentives (or preparing suitable conditions) for the private sector to invest in sustainable transport

In other words, businesses require certainty that there would be a sufficient revenue stream to warrant investment in sustainable transport. Once this is in place, the private sector will be well equipped to translate these incentives into market opportunities. For example, by setting a clear and consistent price for fossil fuels, private companies will invest in technologies that would allow the reduction of their usage.

Companies that provide such products/services would become more competitive and increase their value. In this way, businesses can be incentivised to participate in:

- The manufacturing of sustainable vehicles and fuels
- The operation and management of sustainable transport services, including, for example, public transport and consolidated freight deliveries
- The development and maintenance of sustainable infrastructure

In order for the private sector to benefit from this virtuous cycle, the following key actions are suggested.

Table 10: Actions required from the private sector

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> Seek business/investment opportunities in providing sustainable transport services, and assess their financial viability. For existing transport businesses, assess the opportunities and threats that emerge from a shift towards a low-carbon society, and incorporate these aspects into the business plan. 	<ul style="list-style-type: none"> Develop long-term business strategies and plans to capitalise on the opportunities surrounding sustainable transport.
Shift	<ul style="list-style-type: none"> Initiate businesses that cater to the manufacturing, operation, management and infrastructure of sustainable low-carbon transport. 	<ul style="list-style-type: none"> Further expand businesses that cater to the manufacturing, operation, management and infrastructure of sustainable low-carbon transport.
Add	<ul style="list-style-type: none"> Invest upfront in carbon-saving technologies and practices, which also reduce operating costs of the business in the long term. 	<ul style="list-style-type: none"> Export and diffuse carbon-saving technologies and practices.
Pay	<ul style="list-style-type: none"> Account for all costs of production and operation of transport services. 	<ul style="list-style-type: none"> Apply environmental accounting as a standard practice.

NGOs, civil society and academia

Non-governmental organisations, civil society and academia have long played a crucial role in advancing the debate on sustainable development and pushing for action.

The same applies to the development of a new financing framework for sustainable transport, where already there have been many efforts made by these actors in:

- Developing analytical methodologies that better capture the holistic costs/benefits of sustainable transport
- Advocating sustainable transport through campaigning, research and communication
- Formulating alternative policies which fully support sustainability objectives
- Holding both private and public sector stakeholders accountable by highlighting bad practice and encouraging improvements.

The continuation of such efforts is vital in providing a compass for other actors to follow. Specific actions that can be implemented are provided in Table 11 below.

Table 11: Actions required from NGOs, civil society and academia

	Short term (next two years)	Long term (two plus years)
Analyse	<ul style="list-style-type: none"> Contribute to the development of methodologies to holistically measure transport costs and benefits, including impacts on carbon emissions. Independently monitor the financial flows relevant to transport and climate change, building on the work for example by the Stockholm Environment Institute (SEI) on climate-relevant financing by bilateral aid organisations (SEI, 2009). 	<ul style="list-style-type: none"> Develop a shared database and accompanying methodology to record and monitor financial flows relevant to transport and climate change.
Shift	<ul style="list-style-type: none"> Campaign for and build up momentum for a budgetary shift (in both domestic and international flows) towards sustainable, low-carbon transport. 	<ul style="list-style-type: none"> Press for continuous changes to all aspects of the policy cycle to ensure that the budget shifts are made permanent and mainstream.
Add	<ul style="list-style-type: none"> Highlight transport as a core agenda in the international climate negotiations leading up to and following the COP16. Develop ideas for Nationally Appropriate Mitigation Actions in the transport sector, and communicate these with policy makers (both domestic and international). 	<ul style="list-style-type: none"> Ensure that the implementation of the Post-2012 climate framework fully supports sustainable low-carbon transport. Continue to monitor the applicability and effectiveness of any future financing mechanisms arising within the new climate framework.
Pay	<ul style="list-style-type: none"> Communicate to the public the real costs of unsustainable transport, and build up public momentum for fair and efficient pricing. 	<ul style="list-style-type: none"> Ensure that public acceptance of efficient pricing practices are high, through continuous education and communication.

Coordinating actions

In moving rapidly and concertedly towards the development of low-carbon sustainable transport, it is imperative that actions are coordinated among all levels of governance and funding sources. This requires amongst others:

- A shared understanding of the global vision and local priorities
- Identifying synergies and comparative advantages between financial flows
- Sharing the tools and methods

These aspects of coordination are detailed below.

A shared understanding of the global vision and local priorities

The starting point is a shared understanding of the vision for sustainable low-carbon transport, as expressed in “Principles for the paradigm shift: Need for a strong vision” on page 23, and summarised in the Avoid-Shift-Improve approach.

In all cases, the vision must then be linked to the specific contexts of developing countries, whereby a bottom-up approach that takes into account the priorities of each developing country is required.

Identifying synergies and comparative advantages

Secondly, it is imperative to note that the financial flows described in this paper do not exist in isolation, and are often complex in their interdependencies. This is highlighted in Table 12 below. Wherever possible, synergies between the individual financial flows should be sought, in order to maximise the potential for positive change. Conversely, changes that contradict those of other flows must be avoided.

Table 12: Interdependencies between financial flows

	Private funding	Domestic public funding	International public flows	Climate finance
Private funding	–	Public investment can be used to leverage larger private investments, e.g. through PFI and PPP	Private money is leveraged via ODA, e.g. as PPP. Export credits/guarantees support private investment in risky environments (FDI)	Climate finance can help leverage investments by the private sector, e.g. clean technologies. Crediting mechanisms (e.g. CDM) can develop markets which would otherwise not exist.
Domestic public funding	–	–	ODA can plug short term gaps in domestic public funding, and in the long term help strengthen the sustainability of domestic budgets	Climate finance can be designed to build institutional capacity to support domestic mitigation actions, which will consequently be undertaken by domestic funds.
International public flows	–	–	–	Climate finance is additional to, and can complement international public flows which do not always address climate change as the core objective
Climate finance	–	–	–	–

These flows must also be assessed and combined in a way that makes full use of their comparative advantages, including their level of support for low-carbon transport, scale of the financial resource, ability to provide price signals and incentives, stability and predictability of funding, equity and political and institutional feasibility. It is important to provide a combination of resources that would allow for a sustained level of financing, depending on the specific context of each developing country.

Sharing the tools and methods

The coordination of the aforementioned financial flows would in practice be brought by the sharing of key tools and methodologies used within the policy-making cycle, as noted in “Principles for the paradigm shift”, page 23. Key examples include:

- The harmonisation of guidelines and analysis methods by donors and financial institutions on carbon impacts
- The development and sharing of common transport project/plan appraisal toolboxes and underlying data monitoring systems

To ensure that such efforts are reflected at the level of policy implementation, it is imperative that the capacity of national and local governments are strengthened, and that all stakeholders are fully engaged.

Summary

This White Paper examined the current and future roles of financing to enable the development of sustainable, low-carbon transport in developing countries.

It detailed the current situation in which resources targeted at sustainable transport are generally a small fraction of those allocated for traditional (unsustainable) transport. A significant conclusion was to reorient a wide range of transport-relevant financial flows towards sustainable transport to achieve the required paradigm shift. Such wider flows included international public flows (e.g. ODA, export credits etc), domestic public flows and private financial flows.

The current situation was characterised as follows:

- **Domestic public finance** is mainly used to build and maintain infrastructure that caters to increasing levels of motorised traffic. Budgets are often rigid and reform difficult due to the prevalence of earmarks. Project appraisal frameworks usually follow the mainstream practice that values time and vehicle cost savings, the two main benefits of transport schemes, above climate and other environmental impacts. Furthermore, a significant amount of public finance is spent on environmentally harmful subsidies, most notably on fossil fuels.
- **Official Development Assistance (ODA)** flows are directed towards development based on the motorisation model, reflecting both the requests of recipient countries as well as the menu of technical assistance provided by donor organisations. Financing is particularly directed towards the construction of roads as a result of strategic planning, the current appraisal framework which generally only values time and vehicle operating cost savings, and the inadequate safeguards to halt environmentally harmful projects from being implemented.
- **Private flows** are also directed towards the development of goods, services and infrastructure that support the motorisation model of transport development, e.g. motor vehicle manufacturing. One reason is the exclusion of environmental and social costs in the pricing of transport services in most countries, distorting market signals. Regulatory measures, for example emission standards for new vehicles, are currently inadequate in scale and scope to provide a strong signal to the contrary.

- **Carbon finance** is generally limited in scale and access to these resources is further reduced by the requirements placed upon the transport sector, i.e. a narrow approach to measuring the mitigation potential of policy actions (and the associated incremental costs), together with the lack of data to allow the measurement, reporting and verification of mitigation actions. Carbon crediting mechanisms such as the Clean Development Mechanism (CDM) suffer from large transaction costs, due to the dispersed nature of transport emissions.

In moving forward, a holistic strategy was suggested, involving the following elements:

- **ANALYSE** the impacts of financing decisions taken by relevant stakeholders on sustainability;
- **SHIFT** existing resources towards a sustainable direction;
- **ADD** / increase funding for those areas where resources are lacking; and
- **PAY** for the full costs of transport including environmental depreciation.

Key actions under this ASAP strategy were outlined for each of the major groups of stakeholders, namely:

Developing and developed country governments (national and local) – that can

- Shift their domestic budgets towards a sustainable direction,
- Shape the way in which international support for transport is provided, and
- Provide market signals to the private sector to invest in sustainable ways by applying appropriate pricing mechanisms (such as fuel and vehicle taxes, road pricing, parking charges and distance-based insurance) as well as phasing out fuel subsidies.

Multilateral development banks and bilateral development agencies

– that can

- Evaluate the GHG impacts and/or carbon intensity of investments and technical assistance, and
- Direct their technical assistance to develop capacities, institutions, and knowledge in support of sustainable transport, and
- Align their grant support and lending criteria with sustainability objectives, and catalyse major changes in domestic priorities as a result.

Export credit agencies – that can

- Shift their focus towards facilitating the diffusion of sustainable transport vehicles and promote sustainable infrastructure investments.

United Nations Framework Convention on Climate Change (UNFCCC) and other climate finance institutions/mechanisms – that can

- Facilitate the development of a Post-2012 climate change architecture and mechanisms, including provisions for measurement, reporting and verification (MRV) that would fully allow the transport sector to contribute to mitigation efforts.
- In coordination with development agencies, direct current and future climate financing mechanisms towards capacity building, technology transfer and policy support, to leverage further investments from other sources.

The private sector – which, given the right market signals, can

- Invest in, innovate and create new technologies and services that are supportive of sustainable transport.

Non-government organisation (NGOs) / civil society and academia – that can

- Lead the development of new methods to holistically assess the costs and benefits of transport interventions, and act as advocates for sustainable transport through campaigning, research and public communication.

In moving rapidly and concertedly towards the development of low-carbon sustainable transport, it is imperative that actions are coordinated between all levels of governance and funding sources. This requires amongst others:

- A shared understanding of the global vision and local priorities for sustainable, low-carbon transport and its core elements.
- Identifying synergies and comparative advantages between financial flows/mechanisms to maximise their effectiveness and minimise contradictions.
- Sharing the tools and methods throughout the policy-making cycle, for example harmonising guidelines and analysis methods as well as jointly developing transport programme/project appraisal toolboxes and data monitoring systems.

Next Steps

This White Paper was intended to provide an initial overview of the challenges and required actions surrounding the financing of sustainable, low-carbon transport. Whilst an attempt was made to provide holistic coverage of various financial flows, stakeholders and actions, it is recognised that (although beyond the scope of this paper) several main issues would be highly beneficial to pursue further. The transport and climate community may therefore work further to address, inter alia;

1. The need for “sustainable transport” (and the financing thereof) to move from a general conceptual framework to **specific goals and indicators**. This will help monitor the progress in shifting the paradigm, and better determine the key barriers in case progress is not made.
2. A **better estimation of financial flows** in transport, including
 - Bottom-up estimates of financing in transport by geographic area (country/region/city), mode of transport and by source of finance, to deepen the understanding of the roles of each financial flow in different contexts.
 - Data mining and profiling of past transport projects, to learn from existing practice, and identify key lessons.
 - An estimate of the financing needs for sustainable transport in e.g. the coming 20 years in developing countries, and any potential gaps which may result from the lack of domestic finance. This would ideally cover the entire transport sector, including passenger and freight, urban and rural transport.
 - An estimate of available financing through e.g. ODA and climate finance in e.g. the next 20 years.

3. Modelling the **impacts of changes to the identified financial flows on CO₂ and other co-benefits**, to understand where the most cost-effective interventions lie.
4. **The development and communication of financing models** most suited to sustainable transport, including the modification/application of existing methods such as ODA grants and loans, as well as (variations of) public private partnership arrangements.
5. Understanding the **financial implications of adapting transport systems to climate change**, and how financing for adaptation can be integrated with that on mitigation.

It is hoped that these issues will be addressed through the continued and expanding efforts of the Partnership on Sustainable Low Carbon Transport (SLOCAT) and its members in the coming months and years, to build further on the work undertaken for this White Paper.

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Appendix D: Glossary of terms and abbreviations

ADB	Asian Development Bank	EST	Environmentally Sustainable Transport
AFD	Agence Française de Développement	ESW	Economic and Sector Work
ASAP	Analyse, Shift, Add, Pay	ETS	Emissions Trading Scheme
ASEAN	Association of South East Asian Nations	EU	European Union
ASI	Avoid, Shift, Improve	FDI	Foreign Direct Investment
AU	African Union	GEF	Global Environment Facility
AWG-KP	Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol	GHG	Greenhouse Gas
		GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
AWG-LCA	Ad Hoc Working Group on Long-term Cooperative Action under the Convention	IBRD	International Bank for Reconstruction and Development
BAPPENAS	National Development Planning Agency (Indonesia)	ICCSR	Indonesia Climate Change Sectoral Roadmap
BAU	Business as Usual	IDA	International Development Association
BCR	Benefit Cost Ratio	IDB	Inter-American Development Bank
BOT	Build, Operate, Transfer	IEA	International Energy Agency
BRT	Bus Rapid Transit	IFI	International Financial Institutions
CAS	Country Assistance Strategies	IMF	International Monetary Fund
CEA	Country Environmental Analysis	ITDP	Institute for Transportation and Development Policy
CDM	Clean Development Mechanism	ITF	International Transport Forum
CDP	City Development Plans (India)	ITS	Intelligent Transport Systems
CIF	Climate Investment Funds	JI	Joint Implementation
CO ₂	Carbon Dioxide	JICA	Japan International Cooperation Agency
COP15	15th Conference of the Parties to the United Nations Framework Convention on Climate Change	MACC	Marginal Abatement Cost Curve
		MDB	Multilateral Development Bank
COP16	16th Conference of the Parties to the United Nations Framework Convention on Climate Change	MRV	Measurable, Reportable, Verifiable
CRS	Creditor Reporting System	NAMA	Nationally Appropriate Mitigation Action
CTF	Clean Technology Fund	NATA	New Approach to Transport Appraisal
DAC	Development Assistance Committee (of the OECD)	NGO	Non-governmental Organisation
DfT	Department for Transport (UK)	NMT	Non-motorised transport
DPL	Development Policy Loan	ODA	Official Development Assistance
ECA	Export Credit Agency	OECD	Organisation for Economic Cooperation and Development
		PEROUA	Perusahaan Otomobil Kedua

	Sdn. Bhd. (Malaysia)
PFI	Private Finance Initiative
PPIAF	Public-Private Infrastructure Advisory Facility (of the World Bank)
PPP	Public Private Partnership
PROTON	Perusahaan Automobil Nasional (National Car Project, Malaysia)
SACEP	South Asia Cooperative Environment Programme
SACTRA	Standing Advisory Committee for Trunk Road Assessment (UK)
SDR	Special Drawing Rights
SLoCaT	Partnership on Sustainable Low Carbon Transport
SMC	Social Marginal Cost
STI	Sustainable Transport Initiative (of the Asian Development Bank)
TA	Technical Assistance
TRL	Transport Research Laboratory (UK)
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Convention on Climate Change
USAID	United States Agency for International Development
USAN	Union of South American Nations
USD	US Dollars
VED	Vehicle Excise Duty
VfM	Value for Money
VTPI	Victoria Transport Planning Institute
WB	World Bank
WHO	World Health Organisation
WRI	World Resources Institute

References

- ADB (2008) Clean Energy Financing Partnership Facility - Semi Annual Progress Report, January – June 2008. URL: <http://www.adb.org/Documents/reports/CEFPF/CEFPF-Semiannual-Progress-Report.pdf>
- ADB (2009) Transport Operations URL: <http://www.adb.org/Transport/operations.asp>
- ADB (2010) Rethinking Transport and Climate Change - ADB Sustainable Development Working Paper Series. URL: http://www.transport2012.org/bridging/ressources/files/1/96,Rethinking_Transport_and_Climate_Chan.pdf
- Baker & Mckenzie (no date) Additionality. URL: <http://cdmrulebook.org/84>
- Bakker, S. and Huizenga, C (2010) Making climate instruments work for sustainable transport in developing countries. Forthcoming.
- Barker, T. Dagoumas, A. & Rubin. J (2009) The macroeconomic rebound effect and the world economy Energy Efficiency (2009) 2:411–427
- Bank of Indonesia (2008) Press release – Government explanation on government of Indonesia decree regarding the reduction of fuel subsidy and other related policies. URL: <http://www.bi.go.id/web/en/Publikasi/Investor+Relation+Unit/Government+Press+Release/Fuel+Subsidy.htm>
- Binsted A, Bongardt D, Dalkmann, H, and Wemaere, M (2010) What's next? The outcome of the climate conference in Copenhagen and its implications for the land transport sector. URL: http://www.transport2012.org/bridging/ressources/documents/1/556,Copenhagen_report_FINAL_Bridging_the.pdf
- Button, K. (1993) Transport Economics 2ED. Cheltenham: Edward Elgar.
- Dalkmann, H. and Brannigan, C. (2007) Transport and Climate Change. Module 5e: Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities. Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ): Eschborn. <http://www.sutp.org/dn.php?file=5E-TCC-EN.pdf>
- Dalkmann H and Binsted A (2010) Copenhagen Accord NAMA Submissions. Implications for the Transport Sector. URL: http://www.transport2012.org/bridging/ressources/files/1/586,NAMA-submissions_080210_final.pdf
- DfT (2009) Road Transport and the EU Emissions Trading Scheme. URL: <http://www.dft.gov.uk/pgr/sustainable/climatechange/euemistrascheme>
- EC (2009) Evalsed – The Policy Cycle. URL: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/evalsed/glossary/glossary_p_en.htm#Policy_cycle
- Eddington (2006) The Eddington Transport Study. URL: <http://www.dft.gov.uk/about/strategy/transportstrategy/eddingtonstudy/>

- EEA (2008) Beyond transport policy - exploring and managing the external drivers of transport demand. URL: http://www.eea.europa.eu/publications/technical_report_2008_12
- Embarq (2010) Are VMT and GDP Really Correlated? URL: <http://thecityfix.com/are-vmt-and-gdp-really-correlated/>
- GEF (no date) Incremental Costs. URL: http://207.190.239.143/operational_policies/Eligibility_Criteria/Incremental_Costs/incremental_costs.html
- Huizenga et al. (2009) Common Policy Framework on Transport and Climate Change. URL: <http://www.slocat.net/bellagio-process/common-policy-framework-cpf-on-transport-and-climate-change-in-developing-countries/>
- IEA (2009) World Energy Outlook
- IMF (2001) Fiscal Decentralization Indicators URL: <http://www1.worldbank.org/publicsector/decentralization/fiscalindicators.htm#Formulas>
- IMF (2010a) Government Finance Statistics. URL: <http://www.imf.org/external/pubs/ft/gfs/manual/gfs.htm>
- INFRAS (2004) External Costs of Transport – Update Study. URL: http://www.uic.asso.fr/html/environnement/cd_external/docs/externalcosts_en.pdf
- Kwon, J (2009) Nationally Appropriate Mitigation Actions by Developing Countries. Presentation at OECD Side Event, “Different strokes for different folks: post-2012 MRV and finance” Bonn April 2009. URL: http://unfccc.metafusion.com/kongresse/090329_AWG_Bonn/download/kwon20090401.pdf
- Levinson, H et al. (2003) Bus Rapid Transit. Transit Cooperative Research Program (TCRP) Report 90. Transportation Research Board.
- Litman, T (2008) Appropriate Response to Rising Fuel Prices. URL: <http://www.vtpi.org/fuelprice.pdf>
- Major, M (2008) The Inclusion of Aviation in the EU ETS. Presentation at Side Event Side event: Impacts of addressing aviation and maritime emissions on developing countries, Accra Climate Change Talks, August 2008. URL: http://regserver.unfccc.int/seors/attachments/file_storage/xp03trowdc2p7wq.pdf
- McKinsey and Co. (2007) A cost curve for greenhouse gas reduction. McKinsey Quarterly, 2007(1).
- Metschies, G (no date) Financing Sustainable Urban Transport. GTZ sourcebook for policy makers in developing cities. Unpublished first draft.
- Metschies, G (2004) Financing of Urban Roads in Asian Cities - Experiences and Perspectives. Local Consultative Group for Transport, Urban Development and Transport in Bangladesh, Dhaka Conference, 24 March 2004.
- Metschies, G (2005) Essentials of Sustainable Transport Financing in Asian Cities – Experiences and Perspectives for Good Governance. Presentation given at Environment 2005, Sustainable Transportation in Developing Countries, Abu Dhabi, 2 Feb, 2005
- Morlot, J.C (2009) Understanding Mitigation Support: Financing. Presentation at OECD Side Event, “Different strokes for different folks: post-2012 MRV and finance” Bonn April 2009.

- Nash, C, Matthews, B, Granero, P and Marler, N (2001) Design of New Financing Schemes for Urban Public Transport. THREDBO 7, Molde, Norway.
- Neretin, L., Dalkmann, H. and Binsted, A. (2010) Defining sustainable urban transport for the GEF. UNEP.
- OECD (2009) Matching Mitigation Actions with Support: Key Issues for Channeling International Public Finance.
- OECD (2010) Export Credits. URL: http://www.oecd.org/about/0,3347,en_2649_34169_1_1_1_1_1,00.html
- Pendleton, A and Retallack, S (2009) Fairness in Global Climate Change Finance.
- SACTRA (1999) Transport and the Economy. <http://www.cipra.org/alpknowhow/publications/sactra/sactra1>
- Sakamoto, K (2006) Replacing Fuel Duty with Road Pricing; Implications for Carbon Emissions. Unpublished MA Dissertation, Leeds: University of Leeds
- Sakamoto, K (2010) Innovative financing of low-carbon and energy efficient transport, in Rethinking Transport and Climate Change. ADB and CAI-Asia eds. URL: <http://www.adb.org/documents/papers/adb-working-paper-series/ADB-WP10-Rethinking-Transport-Climate-Change.pdf>
- SEI (2009) Bilateral Finance Institutions and Climate Change: A Mapping of Climate Portfolios. URL: <http://sei-international.org/mediamanager/documents/Publications/Climate-mitigation-adaptation/bilateral-finance-institutions-climate-change.pdf>
- Stern, N (2006) Stern Review on the Economics of Climate Change. URL: http://www.hm-treasury.gov.uk/stern_review_report.htm
- TfL (2007) Central London Congestion Charging – Impacts monitoring Fifth Annual Report,. URL: <http://www.tfl.gov.uk/assets/downloads/fifth-annual-impacts-monitoring-report-2007-07-07.pdf>
- UNCTAD (2008) World Investment Report 2008. http://www.unctad.org/en/docs/wir2008_en.pdf
- UNEP (2008) Reforming Energy Subsidies. URL : http://www.unep.org/pdf/PressReleases/Reforming_Energy_Subsidies.pdf
- UNEP (2009) Submission on Transport by the United Nations Environment Programme (UNEP) to the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA). URL: <http://unfccc.int/resource/docs/2009/smsn/igo/045.pdf>
- UNFCCC (2007) Investment and financial flows relevant to the development of an effective and appropriate international response to Climate Change. URL: http://unfccc.int/cooperation_and_support/financial_mechanism/items/4053.php
- UNFCCC (2010) The Mechanisms under the Kyoto Protocol: Emissions Trading, the Clean Development Mechanism and Joint Implementation. URL: http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php
- Victoria Transport Policy Institute (2006) Road Pricing - Congestion Pricing, Value Pricing, Toll Roads and HOT Lanes. URL: <http://www.vtpi.org/tdm/tdm35.htm>
- WHO (2009) Global status report on road safety. URL: http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/

World Bank (2001) Cities on the Move:
A World Bank Urban Transport Strategy
Review. URL: http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/cities_on_the_move.pdf

World Bank (2007) A Decade of Action
in Transport – An Evaluation of World
Bank Assistance to the Transport Sector,
1995-2005. URL: <http://web.worldbank.org/WBSITE/EXTERNAL/EXTOED/EXTTRANS/0,,contentMDK:21174378~pagePK:64168427~piPK:64168435~theSitePK:3300525,00.html>

World Bank (2008) Clean Technology
Fund. URL: http://siteresources.worldbank.org/INTCC/Resources/Clean_Technology_Fund_paper_June_9_final.pdf

World Bank and PPIAF (2009) PPI
Project Database. URL: <http://ppi.worldbank.org>

WRI (2005) Diverging Paths - What
Future for Export Credit Agencies in
Development Finance? URL: http://pdf.wri.org/iffe_eca.pdf

WRI (2009) Banking on Nature's Assets
- How Multilateral Development Banks
Can Strengthen Development by Using
Ecosystem Services. <http://www.wri.org/publication/banking-on-natures-assets>

WRI (No date) International Financial
Flows and the Environment (IFFE)
<http://www.wri.org/project/international-financial-flows>

Box References

ADB (2010) Sustainable Transport Initiative – Operational Plan. URL: <http://www.adb.org/documents/policies/sustainable-transport-initiative/default.asp>

BAPPENAS (2010) Indonesia Climate Change Sectoral Roadmap – Synthesis Report. URL: <http://www.icctf.org/site/en/indonesia-climate-change-sectoral-roadmap.html>

CIF (2009) Clean Technology Fund – Investment Plan for Mexico. URL: http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/CTF_Mexico_Investment_Plan_01_16_09_web.pdf

CIF (2010) Climate Investment Funds – History. URL: <http://www.climateinvestmentfunds.org/cif/designprocess>

Gruetter et al. (2010) Monitoring Report CDM Project 0672: BRT Bogotá, Colombia: TRANSMILENIO Phase II to IV. URL: <http://cdm.unfccc.int/UserManagement/FileStorage/96YVXI7FQ5JEC2GT1NDWR4MOUP8K0Z>

GEF (2009) Sustainable Urban Transport - the GEF Experience. URL: http://www.thegef.org/gef/sites/thegef.org/files/publication/Investing-Urban-Transportation_0.pdf

GTZ (2009) International Fuel Prices. URL: <http://www.gtz.de/fuelpricesen/themen/29957.htm>

IMF (2010b) Petroleum Product Subsidies: Costly, Inequitable, and Rising. IMF Staff Position Note. URL: <http://www.imf.org/external/pubs/ft/spn/2010/spn1005.pdf>

UNEP (2008) Reforming Energy Subsidies. URL: http://www.unep.org/pdf/PressReleases/Reforming_Energy_Subsidies.pdf

UNESCAP (no date) Malaysia. URL: http://www.unescap.org/tid/publication/part_two2223_mal.pdf

Endnotes

- 1 Based on UNFCCC (2007) and Bakker and Huizenga (2010). All values for the year 2000, except for CDM (annual average between 2004 and 2010), GEF (annual average between 2006 and 2009), and CTF (pledged for 2010 onwards). Domestic finance includes both public and private sources. Export credits are not measured separately to foreign direct investment.
- 2 Export credits have been classified in this section under international public flows. However, as their main purpose is to support private investment in riskier, developing country markets, they may be considered as a “connector” between public and private flows.
- 3 Included are countries for which data in the year 2005 is available. These figures do not include expenditures for e.g. road traffic control, grants, loans and subsidies to vehicle/ship/aircraft manufacturers, street cleaning; construction of noise embankments, hedges and other anti-noise facilities including the resurfacing of sections of urban highways with noise reducing surfaces and street lighting.
- 4 It is well known that catering for traffic demand induces further demand, thus resulting in a vicious spiral towards more and more road building and traffic congestion (see SACTRA, 1999).
- 5 Consumers have relatively easy access to motor vehicle financing where for a very small down payment a person can buy a motorcycle or a light duty vehicle.
- 6 For example, businesses may provide company cars for senior executives.
- 7 The OECD measures export credits in Special Drawing Rights (SDRs), which is a basket of major currencies. To improve comparability, the data was converted into US dollars using the IMF conversion rate of 1.50835 USD: 1 SDR.
- 8 BOT is a popular form of utilising private finance for infrastructure projects, in which a private company receives a concession to build and operate a facility (e.g. highway) for a specific period before transferring ownership back to the public sector (see for example PPIAF, 2010 <http://ppi.worldbank.org/index.aspx>)
- 9 Accounting for private financial flows is fraught with difficulties, particularly in developing countries where accounting rules and standards are not properly enforced, even for large corporations. Needless to say, the various informal transport services in the form of ‘paratransit’, e.g. min-bus and taxi-bus services, are often based on informal financial transactions.
- 10 CDM and JI are two of the flexibility mechanisms introduced under the Kyoto Protocol. The CDM allows developed countries to partially meet their GHG limitation commitments acquiring *credits* from emissions reductions resulting from projects implemented in developing countries (which have no GHG limitation commitments under the Kyoto Protocol). JI allows developed countries to partially meet their targets acquiring emissions reductions *credits* achieved by projects implemented in other developed countries. The third mechanism under the Kyoto Protocol is emissions trading, that allows developed countries to transfer and acquire emissions *credits*.
- 11 Additionality is a key eligibility criteria under the CDM. It requires that emission reductions from a CDM project activity to be additional to any that would have occurred in the absence of the registered CDM project. (see Baker & McKenzie, no date, <http://cdmrulebook.org/84>). The related concept of incremental costs refer to “the difference - or increment - between a less costly, more polluting option and a costlier, more environmentally friendly option” (see GEF, no date, http://207.190.239.143/operational_policies/Eligibility_Criteria/Incremental_Costs/incremental_costs.html)
- 12 SLoCaT is a consortium of UN organisations, multilateral development banks, technical co-operation agencies, NGOs and research organisations. Its aim is to improve knowledge about sustainable low carbon transport, help to develop better policies and to catalyse their implementation. See <http://www.slocat.net>.
- 13 BCR (benefit:cost ratio) refers to the welfare measure conventionally used as part of the appraisal framework, whereas the wider BCR adds on estimates of agglomeration, reliability, labour supply and imperfect competition. The value for money assessment (VfM BCR) further adds a monetised estimate of environmental and some social costs and benefits (Eddington, 2006)

- 14 Road pricing exist in various forms (e.g. road tolls, cordon fees, congestion charges etc) and at different levels (municipal, regional and nation-wide). Common across these types is their potential to place a price on scarce road space, thereby rationalising demand.
- 15 This is not to say that all investments in motorised transport will be phased out. Rather, all investments in transport will need to be assessed in terms of their contribution to sustainable development, which includes but is not exclusively about carbon impacts. For example, rural areas will continue to need further investment in all-weather roads to ensure access to markets and other essential facilities.
- 16 Notable exceptions to this rule may include provisions of public transport as a social service, for example to the most vulnerable or least well-off members of society. Furthermore, cross-subsidies for public transport (from e.g. parking charges) may be justified on grounds of their positive externalities.

