



## A Systematic Approach for the use of Climate Finance to Sustainable Transport

Published by:



**Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH**  
Dag-Hammarskjöld-Weg 1-5  
65760 Eschborn, Germany  
T +49 61 96 79-0  
F +49 61 96 79-11 15  
E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)



**Partnership on Sustainable Low Carbon Transport (SLoCaT)**  
Far East International Plaza, B-1811  
317 Xianxia Road  
200051, Shanghai, China  
T +86 021 5291 9855  
E [secretariat@slocatpartnership.org](mailto:secretariat@slocatpartnership.org)  
I [www.slocat.net](http://www.slocat.net)

Authors:

Philip Sayeg, Heather Allen, Andre Eckermann, Cornie Huizenga and Stacy Swann

Project Team:

TRANSfer II

Reviewers:

Manfred Breithaupt (GIZ), Jorge Kogan (CAF-Development Bank of Latin America), Charles Kooshian (CCAP), Werner Rothengatter, Karlsruhe Institute of Technology (KIT) / University of Karlsruhe (TH), Daniel Sutter (INFRAS)

Layout:

Sandra Frankenberger

Photo credits:

Sustainable Urban Transport Project (SUTP)

On behalf of:



of the Federal Republic of Germany

# **A Systematic Approach to the use of Climate Finance for Sustainable Transport**

1. December, 2015



#### Background Information on the TRANSfer Project

The TRANSfer project is run by GIZ and funded by the International Climate Initiative of the German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). Its objective is to support developing countries to evolve and implement climate change mitigation strategies in the transport sector as “Nationally Appropriate Mitigation Actions” (NAMAs). The project uses a multi-level approach:

- At country level, TRANSfer supports selected partner countries in developing and implementing NAMAs in the transport sector. The NAMAs supported by the project cover a broad variety of approaches in the partner countries Indonesia, the Philippines, South Africa, Peru and Colombia.
- At international level and closely linked to the UNFCCC process, the project helps accelerate the learning process about transport NAMAs with a comprehensive set of measures (events, training programs, facilitation of expert groups, documents with guidance and lessons learned such as the transport NAMA handbook and a database, which is an interactive wiki-based portal that provides access to transport NAMAs).

Activities at country and international level are closely linked and designed in a mutually beneficial way. While specific country experience is brought to the international stage (bottom-up) to facilitate appropriate consideration of transport sector specifics in the climate change regime, recent developments in the climate change discussions are fed into the work in the partner countries (top-down).

For more information see: <http://www.transferproject.org>

#### Background Information on the Partnership on Sustainable Low Carbon Transport (SLoCaT)

The Partnership on Sustainable, Low Carbon Transport promotes the integration of effective low-carbon strategies for the transport sector in global policies on sustainable development and climate change. It carries out its activities with the active involvement of its approximately 100 member organizations representing UN organizations, multi- and bilateral development banks and associated organizations, transport sector bodies, NGOs and foundations, academe and the business sector that have an active interest in sustainable transport. The SLoCaT Partnership facilitates the GIZ TRANSfer International Expert group on Climate Finance for sustainable transport.

For more information see: <http://www.slocat.net/>

#### Background Information on the Expert Group on Climate Finance for Sustainable Transport

The objective of the work stream on climate finance of the GIZ TRANSfer project is to help ensure that climate finance is increasingly used for sustainable transport in an effective way to realize the large GHG emission reduction potential in the sector. Doing this requires an increased mutual understanding and cooperation among actors active in the areas of climate and transport finance. The TRANSfer project intends to target both, the transport finance as well as the climate finance world and develop and distribute recommendations on transport and climate finance based on the following:

For more information see: <http://transport-namas.org/expertgroup/expert-group-on-climate-finance-for-sustainable-transport/>

## DISCLAIMER

Findings, interpretations and conclusions expressed in this document are based on information gathered by GIZ and SLoCaT. GIZ and SLoCaT do not, however, guarantee the accuracy or completeness of information in this document, and cannot be held responsible for any errors, omissions or losses which emerge from its use.

## COPYRIGHT

This publications may be reproduced in whole or in part in any form for educational or non-profit purposes without special permission from the copyright holder, whenever provided acknowledgment of the source is made. The GIZ and SLoCaT would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever.

## ACKNOWLEDGEMENTS

This publication was designed to become a 'living document' aiming to reflect the latest state of play on climate finance and sustainable transport. The development of this paper was a collaborative process, which benefited from various expert reviews and the input from working with the International Expert Group. The objective of the group is to help ensure that climate finance is used effectively to promote sustainable transport and realize its large GHG emission reduction potential. Further information on the group can be accessed at: <http://transport-namas.org/expertgroup/expert-group-on-climate-finance-for-sustainable-transport/>.

The conclusions and recommendations in this paper are based on the joint outputs of the international expert group on climate finance for sustainable transport established by TRANSfer and the research done by the authors.

We would like to thank all reviewers for their valuable feedback and contributions, especially: Manfred Breithaupt (GIZ), Andre Eckermann (GIZ), Jorge Kogan (CAF-Development Bank of Latin America), Werner Rothengatter, Karlsruhe Institute of Technology (KIT) / University of Karlsruhe (TH), Daniel Sutter (INFRAS).

We would also like to thank the representatives of financial institutions, governmental organizations and NGOs who kindly agreed to be interviewed Doris Chevalier (Alstom Transport S.A, Jurg Gruetter, (Gruetter Consulting), Jay Koh (Sigluer Guff), Frank Schroeder UNEOSG, Padraig Oliver (Climate Policy Initiatives), Naeeda Crishna Morgado (OECD), Greg Lowe (Willis-Re), Kevin Whitfield and Duncan Able (NedBank), Magnus Borelius (Gothenburg City Treasury), Charles Kooshian (CCAP), Sean Kidney (Climate Bonds Initiative) and Xiaonmei Tan (GEF).

# « A Systematic Approach to the Use of Climate Finance for Sustainable Transport »





## Content

1	Introduction	17
1.1	Objective	17
1.2	Rationale	17
1.3	Approach	19
2	Realizing ST's Potential for Climate Change Mitigation and Sustainable Development	20
2.1	Potential of ST for Climate Change Mitigation	20
2.2	Enhance the Potential of the Transport Sector	22
2.2.1	Develop Planning and Investment Frameworks	22
2.2.2	Adopt programmatic approaches	24
3	Potential for International Climate Finance to Scale-up Sustainable Transport	25
3.1	Attributes of International Climate Finance	25
3.2	Enhance ST's Eligibility for Climate Finance	26
3.3	Shift ODA to be more climate supportive	27
4	Recommendations for the Systematic Use of International Climate Finance for ST	28
4.1	Systematic Approach to Improving Investment Opportunities	28
4.2	Recommended Use of International Climate Finance for ST	28
4.2.1	Support good policy development	30
4.2.2	Build Investment Pipelines – increase the flow and quality of ST	31
4.2.3	Unlock private investment using Climate Finance	32
4.2.4	Increase Relevance of Technical Assistance and Capacity Building	33
4.2.4.1	Use of TA to drive the climate agenda through progressive policies and standards	34
4.2.4.2	Use of TA for programme/project preparation	35
5	ST Fact Sheets Demonstrating the Systematic Approach	38
6	Conclusions	47
	Bibliography	48

## List of abbreviation

ADB	Asian Development Bank
BRT	Bus Rapid Transit
CAF	Development Bank of Latin America
CDM	Clean Development Mechanism
COP 21	21st session of the Conference of the Parties to the UNFCCC
CF	Climate Finance
CTF	Clean Technology Fund
GCF	Green Climate Fund
GEF	Global Environmental Facility
GFEI	Global Fuel Economy Initiative
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IPCCC	Intergovernmental Panel on Climate Change
LRT	Light Rail Transit
MDB	Multi-lateral Development Bank
MRT	Mass Rapid Transit
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
PMR	Partnership for Market Readiness
PPF	Project Preparation Facility
OECD	Organization for Economic Cooperation and Development
O&M	Operations and Maintenance
ODA	Official Development Assistance
PPP	Public Private Partnership
SDG	Sustainable Development Goal
SECCI	Inter-American Bank Sustainable Energy and Climate Change Initiative
ST	Sustainable Transport
SLoCaT	Partnership on Sustainable, Low Carbon Transport
TA	Technical Assistance
TOD	Transit-oriented Development
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

## Executive Summary

### Financing the gap for sustainable, low-carbon transport

Transportation is responsible for around one quarter of energy-related GHG emissions globally and is the fastest growing of all sources.

Significant transformational investments amounting to trillions of dollars are needed over coming decades to shape sustainable, low-carbon transport (ST) systems, especially in the developing regions such as Africa, Asia and Latin America. The International Energy Agency (IEA) has calculated that the adoption of a low-carbon pathway for the transport sector (equivalent to the recommended two degree Celsius scenario of the Intergovernmental Panel on Climate Change) could generate at least USD 70 trillion in cumulative savings up to 2050, with significant potential for additional savings because of other developmental benefits.

Domestic public sector funding is still the major source of finance for transport today, but it is insufficient to meet the investment needed to address the growing demand for transport (passenger and freight) globally, the new international agenda for addressing Climate Change or the Sustainable Development Goals (adopted in September 2015 by the United Nations General Assembly). Increasingly the private sector is being asked to play a role in funding transport.

Official Development Assistance (ODA) presently represents a minor share of total investment in land transport compared to domestic finance, and is not expected to increase in line with demand. However,

ODA provided by the Multi-lateral Development Banks (MDBs) and other development finance institutions, is critical for partnering with and leveraging domestic public and private finance.

International Climate Finance (ICF)<sup>1</sup> until now has not had the catalytic effect expected, in transforming the transport sector into one which demonstrates its low carbon impacts and achievements, yet it has the potential to take on this role. ICF is much smaller than ODA and the dedicated multilateral climate funds, such as the Global Environment Facility, the Climate Investment Funds, the Nationally Appropriate Mitigation Actions (NAMA) Facility and the newly operational Green Climate Fund (GCF) are not yet able to provide the amount of finance needed or the financial instruments that could assist such a transformation.

ICF must be used to leverage other funds, and the relevance of ICF for the transport sector must be increased, which requires orienting it to where the climate and co-benefits are highest often by complementing other sources of finance (domestic and private sector finance and ODA). ICF should be used more systematically to assist scaling-up ST by meeting the needs of communities, potential financiers and other stakeholders.

*1 Defined as, public climate finance including climate relevant ODA and specific bilateral and multilateral climate funds provided by developed to developing countries. Such funds include: the Green Climate Fund, the Climate Investment Funds, the Global Environment Facility, and bi-lateral climate funds.*

### Sustainable transport solutions

There is growing international recognition for developing ST solutions using the policy framework of 'Avoid-Shift-Improve'<sup>2</sup> to reduce GHG emissions and promote more sustainable development. Adoption of the 'Avoid-Shift-Improve' approach help to manage travel growth and shift consumers to less carbon-intensive modes of transportation while improving the environmental performance of fuels and vehicles. The resultant passenger and freight ST solutions are safer, more affordable, convenient, equitable and resource-efficient. Interventions include inter-urban railways (freight and passenger), modern multi-modal logistics systems, bus and rail-based urban mass transit, improving conventional and shifting to alternative fuels, non-motorized modes. Shifting motorized transport to make greater use of alternative fuels and energy sources (electric mobility)

will play an important role particularly after 2030, and climate finance can play an important role in scaling up from project to full deployment.

International experience shows the important role national governments have in establishing overarching Planning and Investment Frameworks supported by competent national and local institutions, and implementing a sound legal framework. These frameworks are needed to link desirable policies and strategies to priority investment programs whether financed by public and private sources, or ODA. Strengthening the role of sub-national governments is important due to continuing rapid urbanization and the challenges for national governments to effectively implement local transport solutions across many growing cities.

*2 As described by GTZ (2007), "Transport and Climate Change", GTZ Sourcebook Module 5e written by Holger Dalkmann and Charlotte Branninga.*

## Recommendations for the systematic deployment of International Climate Finance

International Climate Finance can play a pivotal role in scaling up ST through systematic support to four key areas.

### 1. Support climate-friendly transport policy development

Investing in climate-friendly, sustainable transport is a long-term commitment, which requires building trust and long-term relationships. It also requires increasing the understanding of the complexities of transport among a large number of actors – governments (national and local), industry, private sector investors, MDBs and other development agencies. Strengthening institutions, improving governance and human capacity within stable political jurisdictions help provide the reassurance and accountability required by investors when considering long-term investments. There are mechanisms and instruments available that can help to provide this enabling framework that ICF can support.

Specific recommendations for ICF are:

- Strengthen country-level transport investment frameworks, including supporting the development of sustainable transport related policies, strategies/ plans, and national and local levels programs.
- Support the development of effective technical standards, including fuel emissions and vehicle performance standards, (and other ST specific standards).
- Develop progressive partnerships between the public and private sectors with appropriate risk allocation that take into account the integrated nature of transport.
- Support capacity enhancement of public policy makers at the federal, sub-national and municipal level, so that policy makers leading project development efforts are better informed about various sustainable transport options.

### 2. Build investment pipelines to improve the flow and quality of ST opportunities

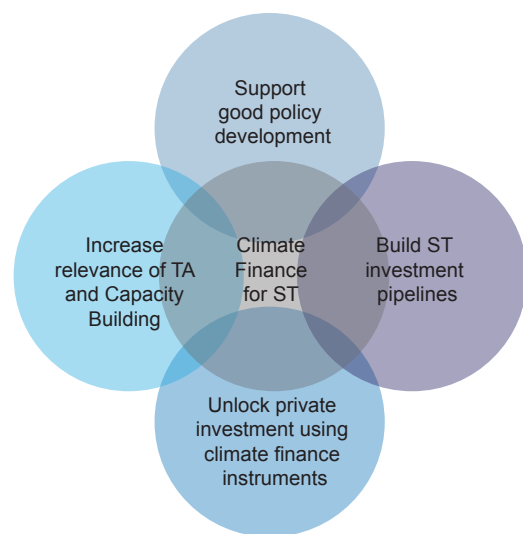
ICF can be used to expand project pipelines and the quality of investments, including their climate relevance, but also facilitate the development of a broader range of ST projects and programs. It can

be used, for example, at an international level in global campaigns to motivate governments to put enabling investment frameworks and policy programs in place, thus permitting the establishment of more ST projects. An example is the Global Fuel Economy Initiative, which provides an international framework for governments to improve their own national fuel economy programs.

An accelerated flow of ST projects is needed in order to attract finance for particular projects that have the potential for private-sector participation. Potential private-sector support can also include other sources of domestic and ODA funding that are often larger than ICF, and can be used for project preparation.

ICF should be used systematically at each point of the developmental stages within an ST project cycle, with the most direct climate benefits and the highest number of co-benefits, per dollar spent, being realized upstream in the project-cycle.

The Pivotal Role of Climate Finance



The systematic use of ICF at each point of the project-cycle is advocated, whilst recognizing that the most direct climate benefits and highest co-benefits per dollar spent are often realized upstream in the project-cycle. The value of using the project-cycle is demonstrated in this paper for three different types

of ST intervention, as examples of the approach: (i) a policy measure at national level (e.g. fuel economy); (ii) a countrywide, sustainable urban transport program; and (iii) a rapid transit project. The recommended use of ICF, linked to the project cycle acknowledges that each project may differ in terms of risks, investment needs and financial arrangements, however there are also many similarities. Creating the conditions that foster more rapid development of ST, at a lower cost, is the realm of programmatic approaches that have been successfully used in several regions of the globe hitherto often with the support of existing sources of ICF. Programmatic approaches can speed up project development by standardizing approaches, building awareness and capacity and initiating project development across several, rather than single, localities.

**Specific further recommendations for the use of ICF in enhancing its flow to ST projects are:**

- **Co-finance major Project Preparation Facilities** with a view to influencing the selection of transport investments and their procedures to favour those with more sustainable and low-carbon profiles.
- **Prioritize further development of ST programs** by the selective use of technical assistance and capacity building.
- **Support preparation of first-of-kind ST projects**, such as a nation's first urban rapid transit system or those projects that are likely to catalyse the preparation of other ST projects.
- **Support education, capacity building and training of public officials responsible for developing sustainable transport projects.** This can be done through a variety of ways, including the sharing of knowledge through city-networks and knowledge sharing platforms.

### 3. Unlock more private investment using Climate Finance instruments

ICF can be used to overcome some key barriers for private investments in ST projects in developing countries through a variety of instruments, both existing and new ones. Instruments can be used to provide low-cost (concessional) debt financing, better risk coverage through guarantees/partial risk guarantees, equity financing and structures, which can (where appropriate) and, amongst other things, help mitigate foreign exchange exposure to the projects.

**Specific supporting recommendations for the use of ICF to help unlock more private investment are:**

- **Improve the efficiency of, and accessibility to, ICF** to address the needs of ST. Regardless of whether ICF is deployed in the form of grants or other investment instruments, the transaction costs associated with applying for the funds, managing the funds, tracking objectives and reporting on the funds are presently significantly higher than privately-managed investments funds and currently this is a barrier to their use.
- **Continue to structure existing sources of ICF into a variety of investment instruments better adapted to the specific requirements of ST.** Current practices should be continued where they add value, including concessional/low-cost debt, guarantees and risk sharing mechanisms, and results-based performance grants, and new ones developed that respond to the requirements of ST and its complexities. Not all risks can be addressed through structuring but they can be better managed and lowered.
- **Use ICF to help bear the costs of currency hedging for project investments.** While foreign exchange risk (FOREX) is not unique to ST investments, it is one of the most commonly cited barriers and from our interviews international investors felt that the use of climate finance in this area could help to facilitate increasing investment in ST projects in developing countries.
- **Assist sub-national governments to use ICF to improve credit worthiness and attract loans from development finance institutions and access to debt markets** (examples include new debt instruments such as climate and green city bonds). To enhance the capacity for municipal financial management, it is also necessary to enhance local sectoral planning and investment, project/program preparation and implementation competencies.
- **Existing funds for ICF could also be used to develop criteria more suited to the characteristics of ST** to increase the overall quantity of finance available for ST and to particular types of ST thus increasing the transformative potential. These criteria (and accepted methodologies for calculating climate impacts) can also be applied to **newer instruments such as Green/Climate and city bonds.**

- **Where appropriate, ST projects that use ICF may also allow investors the opportunity to own equity** to anchor projects in a way that debt capital may not, and that may ‘crowd-in’ additional finance. This is in part due to the scarcity of equity capital in many projects in developing countries, as well as the fact that low-cost debt is of marginal value in the current environment of low interest rates.

#### 4. Increase relevance of technical assistance and capacity building

**Technical Assistance (TA) is considered to be the ‘glue’ that links policies, plans, programs and projects.** Feedback from stakeholders uncovered that it was neither well coordinated nor well coordinated always relevant to project developers or potential investors. Designing and providing more robust technical assistance programs associated with the climate aspects can help build capacity at national and local levels and improve the transfer of knowledge.

**Funding to support the upfront costs to design and develop ST policies, plans, programs and projects is seen as being critical.** Public funds are often limited, sometimes hard to access for capacity building and TA assistance and may not be flexible enough to help policy makers or developers undertake the proper studies, designs or structuring needed to get the project to a stage where financing can be raised.

**TA is essential for the design of good policies, standards and specifications and to build capacity in each**

**of the four key areas identified for ICF.** TA is also vital for supporting program/project preparation including business cases, specifications, and instruments including Measurement, Reporting and Verification (MRV) systems.

**Financial support is also required for public education and awareness, marketing and campaigns to incentivize shifts to more sustainable modes of transportation.** While project design and financing are important areas for ICF many stakeholders recognize that without complementary efforts to change public behaviour, ST projects may have a higher risk of failure because not enough attention or investments were made in this aspect.

**Interventions at global, regional and national scales have visibility and leverage and are likely to be the most valuable use of ICF.** Several of the individual actions within each of the four key areas identified have the potential to be transformative for ST projects. For example, the Global Environment Facility’s support to the Global Fuel Economy Initiative has helped to shift global policy development in this area by more than the sum of the individual commitments in purely financial terms. National and regionally relevant technical standards can also transform local attitudes and accelerate the uptake of new energy-efficient and climate resilient technologies.

**Helping to foster political champions for ST among political leaders, climate funds and civil society is also seen as being highly beneficial.**

## Conclusion

**Meeting the financing needs for scaling-up ST will rely on funding from national governments and expanding investments from the private sector.** Increasing the availability of ICF and ODA for ST will also help. However, current experience indicates that both ICF and ODA need to enhance their climate relevance, recognize a broader range of co-benefits and be used more to leverage domestic and private finance. Concerted action across a broad spectrum of areas is needed by policy makers to address the potential financing gap for ST.

**Policymakers can, and should, explicitly promote the development of ST measures, policies and programs,** including supporting effective enabling environments, incentives for catalyzing ST investments, and promoting behavioral shifts within the general public. Decision-makers who can impact the uses of ICF should ensure that the channels of ICF prioritize ST as a target for funding, and encourage all financial stakeholders to prioritize investments in sustainable transport.

**Climate finance should be used more systematically to address the particular characteristics of the transport sector, the diversity of types of ST and leverage the potential for climate action and significant co-benefits from sustainable transport.** As set out in this paper, the impact will be larger if the limited resources of ICF are not used for project implementation but instead are increasingly used to guide policy development, leverage public and the private funding, target financial instruments and build capacity as advocated by the systematic approach.

**More leadership by the Development Finance Institutions, including the MDBs, bi-lateral DFIs and other domestic DFI partners is needed to accomplish the required shift in approach to the transport sector and the use of both ICF and ODA.** It is recommended that they actively utilize their convening power and influence to effect a major shift in awareness and behavior within their communities to recognize the seriousness of climate concerns, and the need to scale up investment in low carbon transport.





# 1 Introduction

## 1.1 Objective

The objective of this Discussion Paper is to identify how scarce International Climate Finance (ICF)<sup>3</sup> can be systematically used to significantly scale-up sustainable, low-carbon transport (ST) infrastructure and services.

<sup>3</sup> For the purpose of this Discussion Paper, International Climate Finance, is a key subject of interest, i.e. developed to developing country, public climate finance including climate relevant ODA and specific bilateral and multilateral climate funds. Such funds include: the Green Climate Fund, the Climate Investment Funds, the Global Environment Facility, and bi-lateral climate funds.

Specific questions this paper addresses are:

- What particular role could ICF play that differs, or complements, other relevant sources of conventional ODA, domestic and private sector finance?
- How can ICF be applied in a more systematic way to assist the scaling up of ST by meeting the needs of proponents, potential financiers and other stakeholders?

## 1.2 Rationale

With the global population set to increase by one third by 2050,<sup>4</sup> with most growth in urban areas, there are significant challenges hindering the creation of more sustainable development patterns and preventing urban and rural poverty reduction<sup>5</sup>. Transport infrastructure and services can facilitate urban and rural inhabitants access to economic opportunities and essential services such as education and health. When transport is designed to be inclusive, taking into account the special needs of vulnerable people and different socio-economic groups, it is a strong driver of economic growth and poverty reduction. However, transport currently also brings serious negative impacts including road crashes, resulting in loss of life and injury, noise and air pollution, that harm human health. It also contributes about 25%<sup>6</sup> of all energy-related Greenhouse Gas (GHG) emissions that cause global warming.

**Sustainable, low carbon transport (ST) is essential to support sustainable development and increased climate resilience.** It is vital to achieving poverty reduction by providing low income people with access to jobs and services and by enabling them to conduct their income-earning activities safely, affordably, conveniently and equitably. ST is safe, affordable, convenient, equitable and resource-efficient with both passenger and logistics chains exhibiting a reduced reliance on road-based transportation. ST includes

inter-urban railways, green freight initiatives, bus and rail-based urban mass transit, and non-motorized modes.

**Domestic public sector funding<sup>7</sup> plays a vital role in investing in ST infrastructure (refer Box 1.1) but it is currently insufficient to finance the demands for investments in the future,** (this is further elaborated on in Section 2). Raising the share of private sector funding in sustainable transport projects in developing countries is absolutely essential, given the current and expected deficit in public sector capacity to fund the expansion of transport infrastructure and services. Transport investments will therefore likely need to be augmented with private capital to close the funding gap. Access to private capital for all infrastructure development, including transport is constrained; despite global liquidity being high<sup>8</sup> there is a shortage of good investment opportunities and there are still significant barriers to investing in many developing nations.

<sup>7</sup> Public investment in transport is financed by domestic revenues, from government balance sheets or through debt instruments such as bonds that must be repaid, and in the case of low and middle-income countries by loans that also must be repaid to multi-lateral and bilateral financial institutions. The poorest countries are usually entitled to grant funding or very low interest concessional loans from these institutions.

<sup>8</sup> Globally, banks are estimated to manage financial assets of about USD 140 trillion while institutional investors in particular pension funds manage over USD 100 trillion, with capital markets representing another USD 170 trillion (UNEP 2015).

<sup>4</sup> Refer [<https://www.un.org/development/desa/en/news/population/un-report-world-population-projected-to-reach-9-6-billion-by-2050.html>] accessed November 4, 2015.

<sup>5</sup> Likely to represent around 20-25% of the global population at 2050.

<sup>6</sup> IEA (2013)

Transport, as currently structured, will have difficulty in attracting a significant share of the substantial climate finance that has been pledged, as part of the international climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). Land transport's share of funding for climate change mitigation and adaptation actions is low and much lower than its potential contribution to global GHG emission reductions. Today, it is estimated that public and private climate finance flows<sup>9</sup> to developing countries for both mitigation and adaptation actions in all sectors, amounts to 39 to 120 billion USD per year (IPCC 2013). However, less than 10% of climate change mitigation related funds from the Global Environment Fund (GEF) and 16% of the World Bank's Clean Technology Fund (CTF) have gone to low-carbon transport projects. For the Clean Development Mechanism (CDM), this share is even lower, with only 0.3% of Certified Emission Reductions (CERs) being generated from transport projects. Of the total public and private climate finance flows devoted to mitigation, a mere six per cent are estimated to be for ST (CPI 2014). Under the 2010 Cancun agreements industrialized countries agreed to provide USD 100 billion per year of climate finance by 2020, so it is important that ST projects benefit more in the future from climate finance, than in the past.

The systematic deployment of ICF can make a significant contribution to the improved economic, social and environmental outcomes of the transport sector through better investment choices and more sustainable operations. However, the transport sector's complexity puts it at a disadvantage compared to other sectors. Due to its multiple impacts and its horizontal impact on other sectors, transport induces complex behavioral changes, consumes large amounts of energy and generates GHG emissions that are difficult to measure because there are generated from millions of mobile emission sources. The complexity of transport has made it especially difficult for it to compete with the energy sector to access to climate finance. New transport infrastructure or retrofitting existing infrastructure is expensive and it is not expected that even if ICF reached the 100 billion USD target by 2020, ICF will be a major source of funding for climate change mitigation and adaptation interventions in the transport sector. The limited amount of available ICF for transport predicates that it should be used to promote ST and enhanced climate resilience, to support model practices, to influence the use of all ODA and public and private investment for ST.

<sup>9</sup> Here, climate finance is defined as all financial flows whose expected effect is to reduce greenhouse emissions and/or to enhance resilience to the impacts of climate change in accordance with the definition of IPCC (2014). This covers private and public funds, domestic and international flows, expenditures for mitigation and adaptation, and the full value of the financial flows rather than only the share associated with the climate change benefit.

#### Box 1.1:

##### Main Source of Current Funding for Transport

The sum of global investments in transport annually was estimated to be USD 1.4 to 2.1 trillion, with about 58% of this global investment coming from private investment (World Resources Institute, 2014).<sup>10</sup>

Domestic (public) financed investment in transport is, on average, 30 times greater than ODA. Current multi-lateral and bilateral ODA is estimated to be about 2% of the total investments. In 2014, the Multilateral Development Banks reportedly provided USD 6.3 billion to climate finance for sustainable transport, accounting for 23% of their total climate finance portfolio of USD 28 billion (MDB Group, 2015)<sup>11</sup>. ICF for transport provided through dedicated funds, such as GEF and CTF, is only a small percentage (see text) although the Green Climate Fund offers more potential.

Export Credits are more significant for ST project financing than ODA and currently finance over USD 400 billion worth of projects. USD 55 billion of this has gone towards project finance in developing countries<sup>12</sup>; examples include Japan and France using export credits to finance new metro lines in Hanoi, Vietnam

Climate-themed bonds (often government-backed) are a growing market segment. Across all sectors this market was estimated to represent USD 598 billion in June 2015, up from 503 billion in March 2014. USD 66 billion of this were labeled as Green Bonds and the balance of USD 532 billion were unlabeled climate-themed bonds. Transport features strongly in this market and of the 2015 total (USD 598 billion), 88% was investment grade with transport accounting for 72%, 95% of which were for rail (Climate Bonds Initiative 2015).

<sup>10</sup> World Resources Institute. 2014. *The Trillion Dollar Question: Tracking Public and Private Investment in Transport*. <http://bit.ly/1LQnbtC>

<sup>11</sup> African Development Bank, Asian Development Bank, Development Bank of Latin America, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, Islamic Development Bank, and the World Bank Group. 2015. *Joint Report on Multilateral Development Bank's Climate Finance 2014*. Refer [<http://www.worldbank.org/climate/MDBclimatefinance2014>] accessed October 20, 2015.

<sup>12</sup> Refer [[https://en.m.wikipedia.org/wiki/Export\\_credit\\_agency](https://en.m.wikipedia.org/wiki/Export_credit_agency)] accessed October 12, 2015.

## 1.3 Approach

**Desk research was undertaken to assess current approaches to development and transport investments and to examine good practices that could be used to scale up ST.** Current practice is normally for project investments, for ST or otherwise, to be developed on an individual basis. In our research, we note that several governments in the developing world, in some cases with the support of ICF or ODA, have begun to develop programmatic approaches. Typically these programmatic approaches aim to incentivize national and sub-national governments to develop local ST investment programs. This approach has been found to work well in the jurisdictions where it has been employed (such as China, India, and Mexico). This report advocates the systematic use of ICF to expand programmatic approaches and to improve the quality of the preparation of individual projects.

**The findings of desk research were validated through interviews with stakeholders who were drawn from the financial sector** (including the insurance industry,

institutional investors, commercial banking, development finance institutions, private equity, NGOs, and think tanks). The list of stakeholders who were consulted is presented in Acknowledgements. The findings of these consultations have been integrated into the contents of this paper.

**This report was developed through a participatory approach with active contributions from selected members of the expert group and stakeholders, and was peer reviewed.** It will be used for wider outreach from the end of 2015 to mid 2016 at important international meetings (starting with COP 21 in Paris).

**It will also be actively used in the outreach activities of the International Expert Group on Climate Finance for Sustainable Transport<sup>13</sup>** established by the GIZ TRANSfer project and the Partnership on Sustainable, Low Carbon Transport (SLoCaT).

---

<sup>13</sup> Refer [<http://transport-namas.org/expertgroup/expert-group-on-climate-finance-for-sustainable-transport/>].

## 2 Realizing ST's Potential for Climate Change Mitigation and Sustainable Development

### 2.1 Potential of ST for Climate Change Mitigation

In the absence of policies to contain growth in demand for global passenger and freight travel it is expected that this will double by 2050, from 2010 levels, with the highest growth projected in the developing regions such as China, India and Africa. Globally, the developing regions will account for nearly 90% of global travel increases (IEA 2013). A key challenge is to shift the current pattern of investment towards the fast growing developing nations and to re-orient investment towards more sustainable transport modes rapidly; both are urgently required.

**Growing greenhouse gas (GHG) emissions from rapid motorization and increased freight transport<sup>14</sup> in developing countries is an increasing challenge for mitigating climate change.** In addition to generating significant quantities of GHG emissions, the current dominant car-centric model of developing land transport infrastructure, while supporting economic growth, has significant negative impacts on social inclusion, air pollution, and road safety.

**A halving in GHG emissions from transport may be feasible by 2050** based on research<sup>15</sup> from the International Energy Agency (IEA) that supports a 2° Celsius (2DS) global warming scenario. IEA (2012) shows that if the transport sector is to contribute to a 2° Celsius stabilization pathway, GHG emissions from motorized travel must significantly decline in OECD<sup>16</sup> (meaning developed) countries before 2020 and continue to decline until 2050 (refer to Figure 2.1)<sup>17</sup>.

**In the development of transport infrastructure and services there are three broad strategies known as 'Avoid-Shift-Improve'<sup>18</sup>, to reduce GHG and vehicle**

<sup>14</sup> In 2009, transport contributed about a quarter of global energy-related GHG emissions of which about 70% were generated by land transport (IEA 2012). GHG emissions are projected to rise by nearly 50% by 2030 and by more than 70% by 2050 (IEA 2012).

<sup>15</sup> IEA (2014) modeled 4°C and 2°C warming scenarios (with the latter referred to as 'business as usual') in relation to the 6°C scenario, with all scenarios relating to transport's potential contribution to GHG emissions.

<sup>16</sup> Organization for Economic Cooperation and Development.

<sup>17</sup> A forthcoming SLoCaT report on post-2020 measures will provide a more detailed assessment of transport mitigation potential relative to achieving a 2DS

<sup>18</sup> GTZ (2007), "Transport and Climate Change", GTZ Sourcebook Module 5e written by Holger Dalkmann and Charlotte Branninga. Shipper et al. (1999) described this Framework as "Activity, Share, Intensity, Fuel Mix."

**emissions and at the same time enhance welfare and social inclusiveness** through improvements to accessibility enabled by transport, at the national or sub-national scales. These strategies are:

- **Avoid or reduce travel and travel distance by motorized modes.** This can be accomplished through a combination of regional development at the national level and land use planning at the urban level. Better management of the demand for transport through the use of economic and policy instruments can also reduce the amount of travel;
- **Shift to more environmentally and socially-sustainable modes.** The availability, quality and quantity of environmentally sustainable modes as well as better provisions for non-motorized and active modes such as walking and cycling, are important and bring significant additional beneficial impacts on economic welfare (such as lowering traffic congestion with its related loss of time and economic productivity) and social inclusiveness (improved access to employment and primary services and better road safety). In the case of freight transport, a greater share of goods being moved by well-utilized railways or inland waterways will also reduce GHG emissions, air pollution and traffic fatalities.
- **Improve the energy efficiency of transport modes and vehicle technology.** The performance of vehicles is important to mitigate emissions and to increase the efficiency of transport systems. The main negative impacts of poor performance and vehicle efficiency are usually environmental but also impinge on economic welfare, through the choice of types of vehicles, fuel choice and quality, fuel efficiency and the load factors of vehicles (both in terms of passengers and freight tonnage).

**IEA recommends taking measures that reduce GHG emissions, and developing for freight and passenger transport policies that are in line with the 'Avoid-Shift-Improve'<sup>19</sup> approach to manage travel growth and shift consumers to less carbon-intensive modes of transportation.** Shifts to non-petroleum based fuels

<sup>19</sup> As described by GIZ (2010). *The Avoid-Shift-Improve Framework is valuable for systematically defining ST measures to reduce GHG emissions.*

and energy sources (including electric mobility) will also play an important role in reducing emissions from transport, particularly after 2030. A major shift in the behavior of decision-makers and transport system users is also needed to underpin rapid and effective implementation of the actions needed to achieve the 2° Celsius scenario.

**Choices made today on transport infrastructure, technology and services in the emerging and developing economies can either lock them into a fossil fuel-dependent future, or put them on an alternative, low-carbon, pathway.** These choices will determine the impact of transport in the future, in terms of global and national GHG emissions, energy use, air pollution, congestion and road trauma. Redirecting funding away from the road-dominant development model of the present day towards ST infrastructure and services will require significant transformational investments in coming decades, favoring investments in sustainable, low-carbon transport infrastructure and services.

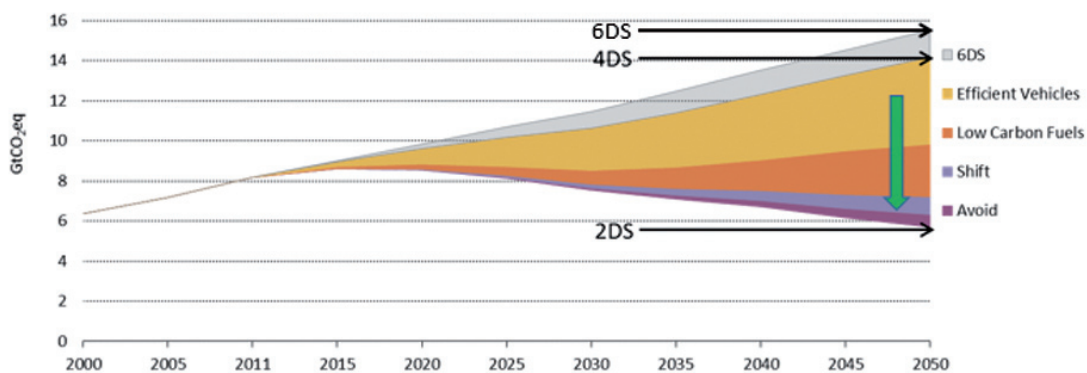
For the period 2015-2035, the Climate Policy Initiative (CPI 2014) estimates the cumulative transitional investment required to be just over USD 3 trillion, of which over 70% relates to land transport. By comparison, around USD 1.4 to 2.1 trillion was estimated to have been spent on capital investments in transport infrastructure globally in 2010 (Lefevre et. al. 2014). The CPI estimates are based on the IEA scenarios shown in Figure 2.1, illustrating the projected emphasis on changes in private vehicle technology and fuels

to 2035 under the 2DS. Bringing forward mode shift initiatives and expanding their role would increase the projection of the necessary transitional investments.

**Transitional investments that focus on low-carbon modes such as railways, mass transit and active transport (walking and cycling) are likely to require both public and private investment.** Traditional investments in rural roads, national highways and cross border links will continue to be needed an additional investment, which can come from ICF, may be required to make this infrastructure safer and more resilient. Appropriate policies, standards, and governance improvements are, nonetheless, needed to support this transition.

**Initial investments in ST can be recouped by the very large cumulative savings in expenditures** (from avoided costs for vehicles, fuels and transport infrastructure) estimated at over USD 70 trillion in the period from now to 2050 (IEA 2012; ITDP 2014). These savings are due to the difference between a sustainable transport development scenario, aligned with the estimated the 2° Celsius warming trajectory, and the ‘business as usual’ (BAU) transport development scenario aligned with the 4° Celsius warming trajectory.

Figure 2.1. IEA Scenarios for Low-Carbon Transport Pathways, Source: IEA, 2013



## 2.2 Enhance the Potential of the Transport Sector

Transport is a strong enabler of other sectors such as education, health, and the economy to reduce poverty but decisions on transport are rarely integrated with overall economic development. Due to the enabling or crosscutting nature of ST, there are many potential co-benefits (e.g. welfare benefits such as improved access to jobs, services and markets) that may be of more immediate relevance to local decision-makers and their constituents than future climate benefits. Other local co-benefits can include improved safety, transport security and social equity. Examples of potential synergies to be gained by better integration of transport into cross-sectorial investment are more compact development forms, lower investment costs and more effective realization of agglomeration economies.

### 2.2.1 Develop Planning and Investment Frameworks

National governments have a leading role in determining the appropriate planning and investment frameworks, supported by competent national and local institutions, and implementing a sound legal framework. These frameworks are needed to link desirable policies and strategies to priority investment programs, whether financed by public and private sources or ODA, as shown in Figure 2.2. This will allow a more strategic use of scarce public funding by linking priority investments to clear strategic, policy objectives. In many countries this will require an interlinked approach to policy reform, regulation reform and the introduction of new financing mechanisms as well as extensive capacity building. Once operational transport infrastructure and services have to be operated and maintained over their economic lives after which reinvestment would be needed. The framework should ensure that the long term financing needs of infrastructure are not overlooked.

Figure 2.2: Conceptual Planning and Investment Framework

Instrument	Content	Time Frame
Policy	Directional intent e.g. reduce road fatalities, achieve certain urban air quality levels, limit GHG emission from transport, create universal rural, urban and national level access	Long term
Strategy and Plan	Strategy/ long term plans integrated with land use (10 to 50 years) – directional in nature, sub-sectorial/ spatial priorities, broad sequencing of land use, transport	10 – 50 years
	Medium term plans – detailed project identification, priority setting	
Program	Investment programs (on rolling basis), consisting of projects and other initiatives including TA and capacity building.	1-2 year committed projects, 3-5 year indicative investments awaiting funding approval
Project	'Ready to implement' projects identified in programs	Once implemented projects have a long life

Five ‘building blocks’ for financing sustainable, low-carbon transport can guide the creation and support the implementation of appropriate planning and investment frameworks. These building blocks proposed by GIZ<sup>20</sup> would favorably influence the travel behavior of individuals and firms, the organization of the transport sector, the raising of adequate finance, and how public and private investment is facilitated:

- **Acknowledging mobility as a public service.** In many countries many citizens, especially those that are poor, are left without access to markets, jobs, education, health and community services. Furthermore, in many nations transport demand exceeds the supply of transport leading to significant congestion and associated externalities that also impact disproportionately on the poor. Some countries, especially developed countries, acknowledge the necessity of access to mobility for everyone in policies and practice and in some countries the access to mobility services is even a constitutional right – however in practice this is not always the case.
- **Getting institutions and framework conditions right.** A coherent policy framework should be established, covering all relevant policy areas and making use of all feasible policy options.
- **The transport-finance-transport principle.** Financing public responsibilities in the transport sector is an unsolved problem in many countries. Sustainable transport, especially public transport or railways, usually involves a high share of spending on operation and maintenance. Unlike private transport, public transport requires the provision of regular and reliable services, and as its ticket price is often set below market levels for social reasons, it frequently requires continued public financial support. Furthermore, many investments in the transport sector tend to be large. With high demands for public financing from all sectors, it is inevitable that the transport sector must endeavor to be largely financially self-sustainable (“transport funds transport”).
- **Pricing transport to moderate excessive demand.** A key economic principle that applies in achieving economically optimal demand is the setting of the price for the use of transport facilities to cover the approximate marginal social costs (marginal operating costs, cost of congestion, fatalities and injuries, and other externalities) of road use.

<sup>20</sup> GIZ (undated), “Building Blocks for Financing Sustainable Transport Sector Development.”

- **Setting clear investment priorities.** One of the key concerns for sustainable transport financing is how to shift investments from conventional, unsustainable modes to low-carbon, sustainable transport. Through the use of appropriate planning and investment frameworks, national transport policies, can be effectively ‘translated’ into comprehensive urban mobility plans, and sub-sector strategic plans that can provide the necessary guidance for prioritizing investments in the transport sector.

**Value capture mechanisms can be implemented on a wider scale to recoup privately enjoyed property value increases, generated from public investment in infrastructure.** Deployed at a greater scale than today, income from improved value capture mechanisms can be used to repay debt raised through bonds or other loans for transport infrastructure financing. There are two main approaches commonly used. Tax Increment Financing (TIF)<sup>21</sup>, most common in the United States, is based on the level of estimated development and the expected growth in property tax revenues from the increased property values. This is used to raise finance by special bond issues to finance transport infrastructure development that in turn helps to ensure this uplift. The second approach uses betterment taxes or special assessments (Walters 2012; Medda et al. 2010). These are levies on business and households within a defined catchment. Levies have a long history in transport infrastructure development and are currently being applied to the funding of Cross Rail in London. All of these mechanisms are effective for capturing all, or part, of the incremental increased value created by public investment but require community acceptance.

**Other supporting policies and instruments are needed to support a better alignment of transport sector with sustainability concerns.** Technical standards can lead to progressive upgrading of vehicles and fuels. Capacity enhancement can raise managerial and technical competence for developing and managing the transport sector. Appropriate planning and evaluation tools and knowledge bases are also needed. Political and community awareness are also essential.

<sup>21</sup> See for example, [[http://www.infrastructure.gov.au/infrastructure/iff/files/IFWG\\_Report.pdf](http://www.infrastructure.gov.au/infrastructure/iff/files/IFWG_Report.pdf)].

## 2.2.2 Adopt programmatic approaches

**Programs set the investments required over the short term (up to five years) and may also be thought of as investment pipelines.** They bring to life the aspirations of strategies and long term plans and their investment priorities. They consist of integrated sets of individual projects and supportive policies and actions (e.g. capacity building). Covering new investment, expenditures on maintenance and operations, effective programs are budget-realistic.

**Governments with the support of MDBs and other international development agencies can incentivize sub-national governments to develop ST programs.** Advantages of a programmatic approach include: (i) enhanced awareness of decision makers; (ii) standardization of approaches to project preparation and procurement with cost-efficiencies; (iii) enhanced capacity of sub-national governments for financing, management of the transport sector and integration with other sectors; and (iv) more efficient implementation across a wider geographic front. Incentives provided by national governments typically include national level funding support and technical assistance for feasibility studies and capacity building. Programmatic approaches could also assist in aggregating investment options that in their own right are too small to attract large scale (bond) financing where governments are sufficiently credit worthy.

**Sub-national governments are experiencing huge demand for low carbon and climate resilient infrastructure for transport, as they expand and their populations grow.** Where cities have sufficient capacity and readiness<sup>22</sup> to raise finance through financial markets, such as the potential to issue green bonds (climate bonds) to finance citywide climate change mitigation and adaptation related projects or programs. This is seen as an area of high potential, as cities often need to implement integrated strategies, including ST projects. As was shown in Box 1.1 the market for green bonds is growing quickly, and it has a strong

transport focus. Growth could be further enhanced by improved standards for measuring the climate impacts of ST projects by the financial markets, as well as reducing the transaction costs for investors and issuers. Such standards, including those for green bonds, come in addition to standards at the product/project or program level. For example, the imminent Climate Bond Standard for low-carbon transport is expected to facilitate the scaling up of green bond issuance for sustainable transport (Climate Bonds Initiative 2015).

**In order to scale-up the quality and number of potential transport investments several development institutions have set up funding facilities designed to improve and accelerate project preparation.** Worldwide, research undertaken in June 2015 by SLoCaT for GIZ has identified 38 Project Preparation Facilities (PPFs) and 28 Infrastructure Financing Facilities (IFFs) (with 7 facilities contributing to both areas). The geographic spread of these facilities is heavily skewed to Africa and Asia – accounting for 40% each of the total number of facilities – while Latin America-focused facilities account for only 4% of the total. Two-thirds (67%) of these facilities state an explicit focus on transport; which include transport sub-sectors such as airports, air transport, roads and motorways, bridges, railways, and/or transport investment strategies such as regional transport corridors, rural access roads, efficient urban transport systems, and improved road safety, among others. They have different procedures for project selection and for project preparation. Particularly where private participation in projects is sought, there is a tendency to focus on toll roads and other transport infrastructure that have the potential to be profitable from user fees. Making these PPFs more relevant to ST and shifting their approach to support sound ST program development appears to offer good potential to realize the climate-change mitigation potential of the transport sector.

<sup>22</sup> UNDP (2012), defines 'readiness' to include the capacity to plan for finance, access finance, deliver finance effectively and efficiently and monitor, report and verify financial expenditures.



## 3 Potential for International Climate Finance to Scale-up Sustainable Transport

### 3.1 Attributes of International Climate Finance

**ICF has the potential to be a useful and catalytic source of funding.** Dedicated multilateral climate funds, such as the Global Environment Facility, the Climate Investment Funds, the Nationally Appropriate Mitigation Actions (NAMA) Facility<sup>23</sup> and the newly operational Green Climate Fund (GCF) have the potential to both unlock private capital and ensure climate objectives are met.

**UNFCCC mechanisms National Appropriate Mitigation Actions (NAMAs) and Intended Nationally Determined Contribution (INDCs) are well suited to ST and have great potential in accelerating demand for ICF (refer Box 3.1).** Both mechanisms have the added benefit of providing a framework for action around a common set of climate objectives for developed and developing countries to include increasing the share of ST. In the past climate finance, channeled bi-laterally or through smaller funds, has proven to be both useful and catalytic. Notable good practices to date include: (i) supporting the development of policy and programmatic approaches (rather than financing individual projects); (ii) stimulating greater awareness of low carbon transport options, for example by engaging in demonstration projects and/or the development of NAMAs, and (iii) financing capacity development for policy, planning, program and project development.

**ICF can play a role in ‘crowding-in’ international private capital and investors, particularly in addressing certain barriers to investment.** While climate finance cannot remove all barriers an investor may experience when investing in ST projects in developing countries, it can help fill a financing gap through a variety of instruments. This includes providing low-cost (concessional) debt financing, risk coverage through guarantees/partial risk guarantees, equity financing and structures, all of which can help mitigate foreign exchange exposure and other risks to the project. It is also extreme-

ly useful in financing technical assistance, project preparation and capacity building during the project development stage.

**In addition to ensuring ICF is effective, multi-lateral channels of these funds need to be designed to be highly efficient, and minimize to the greatest extent possible overall transaction costs.** ICF provided through dedicated multi-lateral, bilateral climate and environmental funds, has different purposes. However each funder is different and some suffer from long and complicated approval procedures with varying, often demanding, methodological requirements. The difficulties are compounded by the need to demonstrate the eligibility of each project. Many of the stakeholders consulted during their interviews (developers, project proponents, investors and other financial stakeholders noted that existing ICF channels are bureaucratic and slow, which overall undermines their effectiveness.

#### Box 3.1:

##### NAMAs & INDCs

Nationally Appropriate Mitigation Actions (NAMAs), and the recently submitted Intended Nationally Determined Contribution (INDCs) have the potential to provide a robust, country-driven framework that can easily translate into investments in many sectors. Many countries have developed sustainable transport NAMAs, and some are currently executing programmatic and project level investment from those strategies. Both NAMAs and INDCs have the potential to strengthen the links between policies–programs–projects, and International Climate Finance should continue to provide technical assistance in many areas to support the successful translation of these plans into investments.

<sup>23</sup> During the climate negotiations 2012 in Doha, Qatar, the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the Department of Energy and Climate Change (DECC) of the United Kingdom (UK) jointly established the NAMA Facility.

Many stakeholders still feel ICF is a niche, and not scalable. Given the relatively high transaction costs, and the limited flexibility in the use of climate finance for transport, some stakeholders feel that it does not bring enough value to a project yet for the effort of getting it. Some stakeholders cited this in relation to using climate finance as a concessional debt instrument. However, in part due to low interest rates in international markets, combined with the resource requirement needed to get the funding and the systems needed to meet reporting requirements, many possible ST projects do not include climate finance because the incremental discount (or ‘concessionality’) of the debt. This is all too often already offset by the lengthy and multiple approval processes presently required.

Other valuable insights gained from the financial sector stakeholders consulted are included in the recommendations made on use of ICF presented in Section 4:

- Several pointed to the need for behavioral change that is often overlooked by policy makers, project developers and financiers.
- **Financing is not always a ‘gap’.** Well-designed and structured projects often do not lack financing options, particularly with the recent emergence of additional development finance institutions. Financing challenges, particularly with transport projects in emerging markets, often have more to do with emerging market risk and creditworthiness, and less about the ‘climate’ or ‘sustainability’ aspects of the projects. In addition, most infrastructure projects in emerging markets require – de facto – significant political risk and country risk coverage (e.g. MIGA<sup>24</sup>), and this would be the case whether the project was a sustainable transport project with or without climate finance. Therefore if the project is ‘bankable’, under present conditions, it can be financed without the need for climate finance. However the down side of this is that it also means that aspects of emission reductions within a project may not be maximized because there is no need to respect any climate criteria.

<sup>24</sup> For example, World Bank Groups’ Partial Risk Guarantees (PRG) for private sector investment projects and political risk insurance provided by the Multilateral Investment Guarantee Agency (MIGA).

## 3.2 Enhance ST’s Eligibility for Climate Finance

Specific recommendations to enhance the eligibility of ST for ICF are:

- **Decision makers should support the use of ICF to promote ST in a manner that corresponds roughly to transport’s share of overall GHG emissions,** taking into account carbon benefits and co-benefits<sup>25</sup> and not just the marginal abatement cost of GHGs.
- **Create a ‘Transport Window’ under different ICF mechanisms to ensure that transport is not neglected due to its complexity.** A special transport window can help to ensure that governments pay attention to reducing emissions from transport, as well as any other sector, and include efforts to both realize its potential to climate change mitigation and build climate resilient transport networks. Because of the significant benefits ST can bring, and the relatively small proportion of ICF channeled to these projects to date, we would recommend specific transport windows to be established in those funds that have the ambition to support transport projects. This signals to both policy makers and investors the availability of ICF for this sector.
- **Develop a White or Positive List of transport measures that are suitable to be funded by ICF,** and harmonize both criteria for defining sustainable, low-carbon transport (ST) infrastructure and services as well as recommended methodologies for measuring impact.
- **Adopt eligibility criteria that match the transport sector.** Projects should no longer be evaluated merely on the GHG mitigation costs per tonne avoided, but co-benefits should be included as important criteria when deciding on the eligibility and the effectiveness of transport projects. We recommend aspiring to quantify these co-benefits quantification in the future but not to make this a prerequisite at the approval stage.

<sup>25</sup> Making decisions on transport purely through a ‘climate lens’ would fail to capture the full benefits of sustainable transport because of its cross-cutting impacts that, for example, in some way have a direct enabling role to each of the 17 SDGs. In current economic evaluation methodologies even when putting a high value on GHG the travel time of users is usually the dominant monetized benefit (Schipper et al., 2009).

### 3.3 Shift ODA to be more supportive

From our consultation process and discussions with practitioners, there was agreement that it would be useful if ICF could be used to shift the focus of ODA and help make both public and private investments in transport more climate-relevant. A greater concern for low-carbon transport development and resilience by ODA need not be incompatible with other economic, social and environmental goals. Through an enhanced eligibility of transport for ICF and an increased focus from ODAs on climate concerns, the total financial resources devoted to ST can be greatly increased in line with the projected demand. Specific recommendations on how ICF can be best used to scale up ST are presented more fully in Section 4.

## 4 Recommendations for the Systematic Use of Climate Finance for ST

There are considerable challenges to facilitate the necessary behavioral changes to prioritize ST in new investments and retrofits, and re-orientate the way transport and associated land development is planned, designed and financed to support a 2° Celsius or lower pathway. There appears no lack of proven technology that can shift us onto low-carbon pathways for transport but the inertia of current attitudes and practices are key constraints.

While much of the necessary transitional investments in ST will be in large infrastructure, carefully targeted ICF can enhance the ST's sustainability and its low carbon aspects, through improving the range and quality of investments and addressing present deficiencies in planning and investment frameworks. ICF needs to be used to leverage other funds or to provide crucial aspects of the project that help to ensure its success. For example, providing support for capacity building among all stakeholders offers high pay-off for low cost. ICF can also support careful investments in governance and technology measures (e.g. control systems, user information etc.) that are necessary to ensure that infrastructure, and the services it provides, operate as an integrated whole, and are less carbon intensive.

### 4.1 Systematic Approach to Improving Investment Opportunities

To meet the expected requirements of a 2°C world, building a robust pipeline of sustainable transport investments is critical. Building pipelines of well-prepared ST investments, at national and sub-national government levels, was identified during the consultations and workshops as being key to future success<sup>26</sup>.

Preparation of individual infrastructure and other investments sits within a wider range of activities needed to undertake effective development and implementation of infrastructure as shown in Figure 4.1. The steps shown in Figure 4.1 express in detail what is embodied in the broad sequence of activities normally referred to as the project-cycle, used by MDBs and other DFIs. Program and project preparation are usually the responsibility of government agencies although ODA/ ICF may also support this process. The key steps for the preparation of an individual project<sup>27</sup> include: (i) refining the concept for a specific project through a pre-feasibility study, (ii) conducting a feasibility study to optimize the project design and to establish its merit, (iii) planning delivery arrangements for the project including project financing, and (iv) processing and gaining approvals that permit the project to proceed to implementation (Adam Smith International 2014). However it should also be noted that at many of these stages the tools

used to establish the benefits of a project are often not well suited to establishing the climate advantages or the co-benefits. Within the process of project preparation, the consideration of a wider range of financing structures and contractual models could better attract private finance (equity and debt) for any project and the capacity building and stakeholder engagement aspects, across all the potential activities as shown in Figure 4.1, need to be reinforced with any project that includes strong climate commitments.

The systematic use of ICF for each of the sequential infrastructure development activities (i.e. the activities within the project-cycle) is advocated for ST. Key reasons are:

- **The project financing and associated needs vary according to the stage of development and the project cycle** e.g. concept versus detailed business case/ project preparation. ICF may have different impacts at each stage and maximizing its use at these crucial points is considered to be important.
- **In the past, MDBs and international development agencies have been the main channel(s) of ICF.** Many of these entities engage with countries and clients across all parts of the policy-program-project cycle and ICF can be delivered via grants, guarantees and loans at various different stages in these cycles;

<sup>26</sup> For example, Huiwenga et al. (2014), SDSN (2015) and Bank of America (2015) for the energy sector.

<sup>27</sup> These steps express in detail what is embodied in the sequence of activities normally referred to as the project-cycle by MDBs and other Development Finance Institutions.

- Procurement/ transaction advisory services are an important part of implementation as this aspect often challenges governments (for example navigating the tendering requirements of MDBs) and/or where projects are extremely complicated e.g. for rail MRT<sup>28</sup>, and for Private Public Partnerships (PPPs) requiring complex and highly specialized procurement preparation and management, which governments may have limited experience and capacity to do. This can be the case for infrastructure and operational aspects, especially in large integrated urban transport projects where there are many specialized contracts to manage;
- Project implementation, including construction and operations, of an ST measure must be well executed – a key risk affecting the ultimate success of sustainable transport investments is poor quality implementation that impacts the projected performance (i.e. higher costs and lower patronage than expected). Poor quality construction or bad procurement decision can also shorten the economic life of the asset (requiring major refurbishment earlier than anticipated).
- Conventional financing is typically limited to the construction/ implementation phase. Financing to support other stages of the project cycle, including Measuring Reporting and Verification (MRV) of the climate impacts and overall evaluations, may be also be suited to ICF. Furthermore, improved project preparation (and demand estimation) and development of appropriate procurement modalities for PPP can assist in addressing any gaps between revenues and operating costs often encountered initially by new rapid transit projects.

Without the support of good policies to guide, regulate and manage development of the transport sector the building of pipelines of good quality ST investments would be insufficient. Suitable policies would set the standards to be met by vehicles, infrastructure and services across nations in the future. They would determine how transport infrastructure and services are planned and delivered and are integrated with other sectors. Other supporting actions are also needed as described below.

28 MRT - Mass Rapid Transit

Figure 4.1: Infrastructure Development and Implementation Activities, Source: Adam Smith International, 2014



Since sustainable transport interventions can vary greatly in type and level of investment for the purposes of this Discussion Paper, the value of using the sequential activities shown in Figure 4.1 (the ‘project-cycle’) is shown later in Section 5, which examines three types of ST intervention as initial examples of the approach: (i) a policy measure (e.g fuel economy); (ii) sustainable urban transport program (e.g the introduction of alternative fuel) and (iii) rapid transit project (e.g BRT, LRT or MRT).

## 4.2 Recommended Use of International Climate Finance for ST

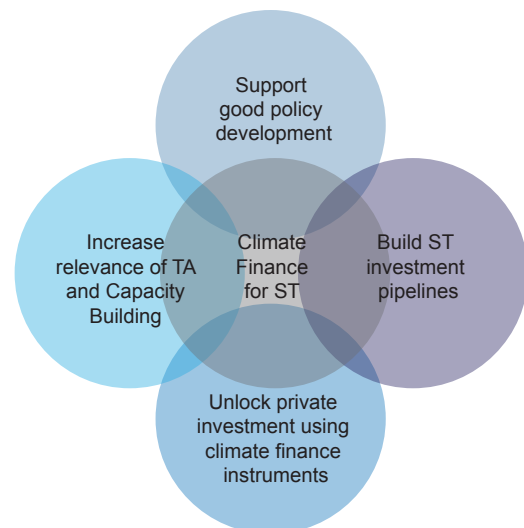
International Climate Finance can play a pivotal role in scaling up ST through systematic support in four key areas. From the research and consultations undertaken these are shown conceptually in Figure 4.2 and are:

- Support good policy development;
- Build investment pipelines to improve the flow and quality of ST investments;
- Unlock private investment using a variety of Climate Finance Instruments (e.g. addressing risks or financing gaps); and
- Increase Technical Assistance and capacity building and its relevance<sup>29</sup>.

Effective policies supported by ICF are needed to set the framework for more sustainable development of the transport sector. Better investment pipelines are needed to identify, prepare and implement the ST investment opportunities. ICF also has a role in expanding the financing options used for ST projects; including addressing key investment risks and lowering transaction costs. It can also be used to increase the relevance of TA and capacity building.

<sup>29</sup> What this means is that capacity building needs to build national and local capacity as part of the legacy of the project and it is not enough to just hold one or two workshops as the capacity building component of a ST project.

Figure 4.2: The Pivotal Role of Climate Finance



### 4.2.1 Support good policy development

Development of improved investment pipelines cannot be fully effective without attention to the enabling ‘eco system’. This was confirmed during the consultations with stakeholders. At the policy level, ICF can be useful to:

- **Strengthen country level investment frameworks**, including supporting the development of sustainable transport related policies, strategies/plans (linked to land use and other sectors), and program frameworks identified in Section 2. These include policies which can help incentivize modal and technology shifts (e.g. revisions to fuel taxes and vehicle ownership and user charges), and incentives for sub-national governments and municipalities to incorporate sustainable transport into overall economic development;

- **Design effective technical standards**, including fuel emissions and vehicle performance standards, (and other ST specific standards such as those for access to public transport or the infrastructure provision standards for walking);
- **Develop progressive partnership arrangements between the public and private sectors** with appropriate risk allocation that accounts for the integrated nature of transport
- **Support capacity enhancement of public policy makers** at the federal, sub-national and municipal level, so that those policy makers leading project development efforts are more aware of the various sustainable transport options.

The specific policy recommendations to enhance the ‘eco-system’ are provided in Section 4.2.4 that covers **Technical Assistance**, as most of the needed actions would require a variety of forms of Technical Assistance for technical advisory services, knowledge development, development of analytical tools and capacity enhancement.

## 4.2.2 Build Investment Pipelines – increase the flow and quality of ST

Existing pipelines fall short of what is necessary in both volume and quality. Scarce ICF funds should be used wisely to ‘fill the financing gap’ for existing pipelines, to expand pipeline development and to improve the quality of constituent investments. It can also be used to facilitate the development of broader range of ST opportunities. Solving the pipeline challenge can be brought about with better education of policy makers and transport planners, national and local government officials, as well as local financial institutions and project developers.

Accelerating the development of the flow of ST projects is also needed to attract financing for particular projects that have the potential for private sector participation. This can include other sources of domestic funding and ODA that are larger than ICF and also available for project preparation.

Specific recommendations for use of ICF on enhancing the flow of ST investments are:

- **Co-finance major Project Preparation Facilities with a view to shifting the selection of transport investments and their procedures to be more sustainable and low-carbon.** This includes the enhancement of project-preparation procedures to fully account for carbon, welfare and the full range of other benefits that may be realized via ST. While international climate funds such as GEF and CTF provide grants for project/program preparation, they are not involved in the direct co-financing of standalone PPFs. There appears to be potential for the involvement by ICF through PPFs to improve both the selection of projects and the quality of project preparation from a climate perspective, and at the same time to include other co-benefits.
- **Prioritize the development of ST programs across multiple jurisdictions by the selective use of technical assistance and capacity building (further described in Section 4.3.5).** Where programmatic approaches have been applied in the identification, approval and funding of projects (e.g. in China, Colombia, India and Mexico) remarkable results have been achieved with rapid and simultaneous deployment. A Fact Sheet on how a multi-jurisdictional ST program may be developed and the role of ICF is set out in Section 5.
- **Support preparation of first-of-kind ST projects, such as a nation’s first urban rapid transit system or similar projects, which are likely to be catalytic.**
- **Support education, capacity building and training of public officials responsible for developing sustainable transport projects.** This can be done through a variety of ways, including through city-networks and with knowledge-sharing platforms<sup>30</sup>.
- **As more ST Nationally Appropriate Mitigation Actions (NAMAs) are developed, this learning can be progressively transferred to PPFs and project/ programmatic preparation so that in effect NAMA principles are mainstreamed.**

<sup>30</sup> For example, *TransFORM, city-to-city peer learning and knowledge dissemination through a nationwide platform on urban transport solution platform that was jointly established by the World Bank and China in 2014.*

### 4.2.3 Unlock private investment using Climate Finance

Private investment has an important role to play in scaling up ST. While ICF cannot solve all challenges to investment in ST in developing countries, it can usefully fill a financing gap through a variety of instruments. They include providing low-cost (concessional) debt financing, risk coverage through guarantees/partial risk guarantees, equity financing and structures, which can mitigate foreign exchange exposure to the project. It is also extremely useful in financing technical assistance, project preparation and capacity building during the project development stage

However, as mentioned, just because climate finance is available this does not mean that those who most need it will take it up. Feedback from some stakeholders was that not all instruments are attractive (e.g. concessional debt and/or risk sharing guarantees). Some stakeholders cited the high transaction costs, the systems needed to meet reporting requirements and length of the approval process as significant barriers to using climate finance.

ICF can assist sub-national governments to improve their credit worthiness and attract loans from MDBs and increase their access to debt markets (e.g. via new debt instruments such as climate and green city bonds). To enhance the capacity for municipal financial management, it is also necessary to enhance local sectorial planning and investment, project/program preparation and implementation competences. Providing the opportunity for sub-national governments to access finance would also incentivize them to develop their own ST projects and programs. For example, the City Creditworthiness Academy led by the Public-Private Infrastructure Advisory Facility and World Bank's Low Carbon Livable Cities Initiative aims to help sub-national authorities become creditworthy in order to access market-based financing (refer Box 4.1). ICF could be used to co-finance such initiatives because of the strong mutual benefits.

Deploying ICF as equity into investments could be highly valuable, and anchor projects in a way that debt capital may not, and can 'crowd-in' additional finance. Many developers and project finance stakeholders have noted that using ICF as equity to anchor an investment could be more useful than deploying the same funds as low-cost debt. This is in part due to the scarcity of equity capital in many projects in developing countries, as well as the fact that low-cost debt is of marginal value in today's world of low interest rates. Given the relatively high transaction costs

for accessing ICF, the value of the funding would be greater if invested in projects as equity<sup>31</sup>.

Improving the efficiency of, and accessibility to, ICF funds is needed notwithstanding the need for greater flexibility with investment instruments. Regardless of whether ICF is deployed in the form of grants, or other investment instruments, the transaction costs associated with applying for the funds, managing the funds, tracking objectives and reporting on the funds are significantly higher than privately-managed investments funds. Governance issues within many of these funds have resulted in ambiguous division of accountabilities, which has directly resulted in increased inefficiency and costs to the funds.

#### Box 4.1:

##### Capacity Building to Improve Municipal Creditworthiness

Access to financing is a major hurdle to all aspects of sustainable urban development, including sustainable transport. The World Bank's City Creditworthiness Initiative helps cities improve their financial performance and secure the private investment they need to fund climate-smart infrastructure and services. The investment required to such infrastructure is immense. However, in order to attract investment from private sources, municipalities must also be creditworthy. This program supports cities and municipalities on this crucial first step and helps them unlock finance for large, long-term, sustainable investments that will provide critical services to resident populations and foster green growth through sustained climate-smart urban development.

Many barriers to investment are tied to perceived risks, such as emerging market risk, political risk, and developer risk. Financial and non-financial risks require different solutions. Not all risks can be addressed through structuring but they can be better managed and in many cases lowered.

Existing sources of ICF are regularly being structured into a variety of investment instruments. This practice should be continued where they add value, including concessional/low-cost debt, guarantees and

<sup>31</sup> However, equity investments may require additional obligations on the part of the designated implementing entities.



risk sharing mechanisms, and results based performance grants. Refer Box 4.2.

**ICF can play a role by bearing the costs of currency hedging for project investments.** While the foreign exchange risks (FOREX) are not unique to ST investments, these risks are one of the most commonly cited barriers that international investors mention. There is therefore a role for climate finance to help them overcome this and increase investments in developing countries. Almost all major sustainable infrastructure projects which collect revenues in local currencies will have an issue servicing debt financing, for example, if this has to be paid in Euros or US dollars. This creates a mismatch between local revenues, and debt servicing in hard currencies results in an inordinately unfair burden on local projects. Ultimately this can undermine the benefit of the concessional funding provided to the investment. Normally this cost is passed on to the consumers, but due to the social nature of many ST projects that can jeopardize the financial sustainability of the final outcome.

**Many non-financial risks can be addressed through a variety of means that primarily revolve around improving the quality of project and program preparation** (within project investment pipelines) that includes activities such as; (i) improved project and program preparation, including better accounting for: (a) optimism bias where demand is often overestimated and investment cost systematically underestimated business cases (Flyvbjerg, 2004), and (b) improved economic evaluation that factoring in all economic, social and environmental benefits including the carbon effects; and (c) better procurement decisions. Specific recommendations on relevant topics are made in Section 4.3.4 dealing with Technical Assistance.

#### Box 4.2:

##### Risk Sharing & Partial Guarantees

Risks sharing facilities (RSF) and partial risk guarantees have been used for more than a decade by Development Finance Institutions and MDBs to push local financial institutions to engage more deeply in climate related investments. Often these products are funded with climate finance, and seem to both successfully allocate risk among all parties in a deal, and build local capacity among financial institutions. Private equity and other investors often cite the model as an appropriate way to structure funding vehicles to invest in climate in more risky markets. However some feedback from local financial institutions is that these facilities may ignore important regulatory requirements – including headroom and sector limitations – and increase overall the local financial institutions transaction costs, thereby making them less attractive. Some stakeholders suggested that in order to catalyze the local financial sector, a more efficient approach would be through credit lines or other mechanisms that enable Development Finance Institutions to access climate finance more efficiently and deploy it more effectively.

## 4.2.4 Increase Relevance of Technical Assistance and Capacity Building

Technical Assistance (TA) is the ‘glue’ that links policies, plans, programs and projects and deserves separate discussion because feedback from stakeholders was that it was not well coordinated and not always relevant to project developers or potential investors. As described above, the scope of TA covers technical advisory services, knowledge development, development of analytical tools and capacity enhancement. While capacity enhancement is identified as a separate aim of TA, the first three uses of TA by their nature also enhance capacity.

**Funding to support the upfront costs to design and develop ST policies, plans, programs and projects are critical.** While TA may not be a large part of overall costs, funds for it are often limited, hard to access, and may not be flexible enough to help policy makers or developers undertake the proper design, studies or structuring needed to get the project to a stage where financing can be raised. Where TA/grants exist for these activities, often it is for single components, rather than all the components needed to prepare a project.

**TA, grants for planning and design and other upfront costs need to be part of a larger investment program.** Simply providing TA/grant funds does not ensure projects will be financed or that there will be the capacity on the ground to deliver it. Clearer links between upfront grants supporting the design of ST projects and investment and implementation would give greater comfort to investors and other financiers.

**It would be unwise to underestimate the need to provide financial support for public education, increasing awareness, marketing and other campaigns to incentivize shifts to more sustainable modes of transportation.** While project design and financing are important areas for ICF, many stakeholders recognize that without complementary efforts to convince the public at large to embrace more sustainable transportation options, adoption rates may be slower than predicted or projects may be at risk for failure.

Associated education and public awareness efforts are typically left to governments (at the national and subnational levels), and are often vastly underfunded. Currently capacity building and TA in adaptation is particularly lacking.

Many stakeholders noted that supporting these efforts through ICF as part of an overall program to move people into more sustainable transport could dramatically increase the probability of long-term success. ICF has a valuable role to play in changing attitudes and behaviors of political leaders and their constituents to favor ST, and this can be done at low cost. Expanding the interest of investors in green bonds or other investments in sustainable transport would be aided by improving their knowledge of what constitutes a suitable 'green' or 'climate-aligned' investment and the benefits to their portfolios.

#### 4.2.4.1 Use of TA to drive the climate agenda through progressive policies and standards

It is necessary to improve the use of TA to drive the climate agenda through progressive policies and standards. ICF can provide significant transformative impacts by improving the enabling framework for ST such as: (i) better integration of cross-sectorial governance and financing; and (ii) the development of climate friendly transport sector policies and standards; (iii) better transport sector planning and investment frameworks including procedures, governance and tools/ technical methods that are predictable and standardized where possible for both national and sub-national levels.

**Specific recommendations where ICF can assist cross-sectorial coordination:**

- **National budget laws should promote development of sub-national planning and investment competence and financial capacity.** Here ODA with possible co-finance from ICF can assist in drafting relevant legal provisions. The case for climate finance here is strong because of the potentially favorable climate impacts of more technically capable and solvent sub-national government entities, and other co-benefits.
- **Similarly, national administrative laws should promote effective cross-sectorial policy making and public investment management.** ICF directed to capacity building to improve prioritization, programming and multi-year budgeting to make Medium Term Expenditure Frameworks more effective would also draw attention to the fi-

nancial impact of effective climate mitigation and adaptation decisions that may take several years to be realized.

**Specific recommendations where ICF can assist at the level of the transport sector include:**

- **Sector policies can prioritize low-carbon modes** as in China's State Council Directive 64 that contributed to the new policy directions in the 12th Five Year Plan (2011-2015), giving priority to public transport development and integrating transport and land use. It also provided financing incentives for city-level led public transport projects, produced guides on comprehensive transport hub development and on the development of urban pedestrian and cycling systems (2012-2013). While domestically funded, the China-Global Environmental Facility-World Bank Urban Transport Partnership Program implemented from 2007-2014 directly influenced the work.
- **Policies should promote more efficient pricing of externalities from road transport** (congestion, GHG and local emissions etc.) to reduce and optimize demand and foster more sustainable travel behavior. The removal of distortionary subsidies for fossil fuel use by private transport should be a priority.
- **Forward looking standards can facilitate market transformation.** Promotion of the accelerated introduction of fuel economy /efficiency impro-

vements on a global scale brings multiple benefits including energy saving, GHG emissions reduction, improved air quality, and for many countries improved energy security and savings in scarce foreign exchange. The establishment of the Global Fuel Economy Initiative (GFEI) with financial support (amongst others) from GEF illustrates the potential impact of a global program supported by ICF. (See Box 4.3).

- **Standards should also consider other social and environmental aspects**, like standards for busses (where universal access is a desirable target), resource efficiency for the design, implementation and operation of infrastructure (e.g. minimizing carbon emissions, the use of land, water and other resources). Standards need to evolve over time and not remain static. ICF can assist building the awareness of the value of progressive and timely implementation of standards that set out a roadmap of improvements over the medium term, as well as help to share this knowledge between countries.

#### Box 4.3:

##### Global Fuel Economy Initiative

Aiming to facilitate market transformation for sustainable mobility in urban areas leading to reduced GHG emissions, UNEP, the International Energy Agency, the International Transport Forum and the FIA Foundation, with support from the GEF and other international funds and organizations, launched the Global Fuel Economy Initiative in 2009/2010.

GFEI has developed a comprehensive program to improve global automotive fuel economy within the next few decades. Fuel economy improvements that make use of proven existing technologies are assessed as being able to achieve a 50% reduction in fuel use per kilometre for new Light Duty cars by 2030. GFEI is pledging to get 100 countries involved in its capacity-building work by 2016 in order to build momentum and maximize the global impact of fuel economy improvements. It has already successfully implemented CO<sub>2</sub> and fuel reducing policies in 25 countries and its goal is to expand to 100 countries by 2030.

[\[www.50by50campaign.org\]](http://www.50by50campaign.org).

#### 4.2.4.2 Use of TA for program/project preparation

**Improve the use of TA for project and program preparation to address climate concerns** (mitigation and adaptation) by national and sub-national governments for project/program preparation, efficient implementation, and operations, to support the effective development of project and program pipelines:

- **Support better project prioritization and preparation** (i.e. including the business case) particularly where capacity is weak and where new technologies are involved).
- **Standardize Terms of Reference (TOR), the development of common methods of project preparation including business case development, procurement approaches and related capacity building** to offer economies, joint learning amongst jurisdictions, faster implementation, and reduce risk for investors.
- **Develop effective partnership arrangements codified by contracts** (with an appropriate risk allocation) between public and private sectors to

achieve better integration of transport infrastructure and services – the codifying of these into standard contract forms can be used in other jurisdictions to streamline procurement and implementation processes<sup>32</sup>.

- **Where risk-averse private sector finance is involved**, capacity needs to be developed to ensuring the integrity of the implementation of prototype ST projects and that contingent liabilities are well managed so these projects are no more or less risky than publicly financed ones.
- **Supporting the development and implementation of reporting, evaluation and appraisal systems** (e.g. MRV).

Within the process of developing individual program/project investments, specifications for infrastructure and vehicles to be procured can anticipate future standards and good practice from other jurisdictions. Currently, unless specifications call for

<sup>32</sup> As for FIDEC engineering contracts [<http://fidic.org/bookshop/about-bookshop/which-fidic-contract-should-i-use>].

advanced standards for emissions, energy-efficiency and other aspects, prospective tenderers do not offer them as this increases the cost of their bids. However, ST projects can be used to help accelerate the adoption and lower the costs of new cleaner technologies and practices and they should not hesitate to do so. For example the capital investment of advanced energy-efficient and low-emission buses may appear to be more expensive initially, but their total cost of ownership TCO (whole-of-life) costs or the financing package that accompanies them in fact makes them a better purchase than more conventional buses. ICF can also be used to ensure that procurement processes are upgraded to allow the most climate friendly options to be purchased – this is presently affecting the purchase of full electric buses in some countries, as they do not comply with the procurement specifications for vehicle purchase.

Specific recommendations where ICF can assist are:

- **Develop specifications for vehicles, facilities, infrastructure that reflect early adoption of stringent standards** – in line with those that may exist when the project is open and not those that exist today.
- **Standardize specifications for use on other projects in the country / region.** A modular approach may be appropriate with attachments providing progressive updates of technological requirements to avoid long processes of development of new specifications.

- **Support capacity building for tender assessments** to capture TCO cost, energy use and emission reductions.
- **Provide support to adjustment of national and local regulations that may require only the lowest cost tender to be accepted** (as is common in many developing countries).

**The use of ICF as described would assist recipient country decision makers to make more informed use of bilateral export credits** (often used to finance railways and bus systems in developing countries). The nations providing the bilateral export credits are usually those where technological standards are quite high. A TCO costing assessment is usually needed to fully understand the attractiveness of financing packages involving export credits.



## 5 ST Fact Sheets Demonstrating the Systematic Approach

The systematic approach showing use of ICF in support of different stages of infrastructure development and implementation/ project cycle is illustrated in Tables 5.1 to 5.3 covering:

- Policy: Fact Sheet for Fuel Economy Standard – Table 5.1.
- Program: Fact Sheet for Multi-Jurisdictional Sustainable Transport Program – Table 5.2.
- Project: Fact Sheet for Mass Rapid Transit (Bus/ Rail) – Table 5.3.

The Fact Sheets contain the following information:

- Description of the ST measure;
- The type of measure – standalone, part of a network, part of a program etc;
- GHG reduction potential;
- Range of co-benefits;
- Investment cost range;
- Main financing sources/potential for private sector involvement;
- Direct revenue sources;
- Financial feasibility;
- Economic feasibility;
- Main barriers and risks by stages of project cycle – including recommended use of ICF and likely percentage of total cost requirement that can be met by ICF for each stage to obtained leverage for more effective implementation of ST.

Completing the systematic approach four areas were identified where the specific recommendations on use of ICF were focussed (refer Section 4). Table 5.1 shows how ICF can build ST programs and expand investment pipelines. Tables 5.2 shows how ICF can improve project preparation and the implementation of a large ST investment (rapid transit). Table 5.3 shows how small amounts of ICF can be used to develop a sector-wide fuel economy policy. The use of different types of instruments for delivering ICF including grants/ equity, risk mitigation measures and use of technical assistance are shown. Together these four areas are where the specific recommendations on use of ICF were focussed (refer Section 4).

A key observation is that ICF can have significant strategic impact when applied upstream in the development of ST infrastructure programs and projects. It shows great potential for systematic mitigation of financial, technical capacity and knowledge barriers.

Table 5.1: Policy - Fact Sheet for Fuel Economy Standard			
Description:		Development of a nation-wide fuel economy standard for Light Duty Vehicles (LDVs) vehicles in a region	
Type:		Policy (National technical standard)	
GHG reduction potential:		Potentially very significant as it improves fuel economy progressively over time in all new vehicles nation-wide	
Co-benefits:		Health benefits/ air quality	
Costs:		Very low identification/ preparation costs; implementation costs can be tax neutral and are other responsibility of manufacturers although costs overall are usually offset from gains from reduced fuel use.	
Financing sources:		<p><u>Domestic public finance</u>: for the development of standards, new testing and approval procedures, consultation with motor vehicle industry and related stakeholders and in some cases the introduction of new Inspection and Maintenance I&amp;M procedures</p> <p><u>ODA</u>: grants may be used to support development of technical standards</p>	
Direct revenue sources:		Not applicable	
Financial feasibility:		The implementation of the measure may be revenue neutral at worst – reduced fuel taxes would be expected to be compensated by lower public health costs	
Economic feasibility:		The measure is economically feasible, typically with a very positive cost-benefit ratio due to significant co-benefits (fuel savings, improved air quality, etc.).	
Main barriers and risks by stages of project cycle:		Recommended use of ICF	Approximate cost range
Identification/ concept			
Barrier	Lack of understanding by government of benefits, potential resistance from auto industry who may claim cost of cars will rise	ICF may finance awareness raising activities with decision makers, and consumers, support to engagement with industry	From EUR 0.1–0.2 m, ICF may fund up to 100%
Preparation			
Barrier	Uncertainties due conflicting information on appropriate technical approach for development of standards (e.g. average fleet or individual class) and time frame over which manufacturers say they can comply	ICF may finance a TA to provide technical advisory services to support development of an appropriate fuel economy standard for one or more classes of vehicle	Up to EUR 0.5 m, ICF may fund up to 100%

<b>Procurement/ transaction advisory services</b>			
Barrier	Resistance from OEMs for new type approval tests or to accept international standards.	ICF may be used to support continued consultation with industry and communication programs with consumers and media	From EUR 0.1-0.2 m, ICF may fund up to 100%
<b>Construction/ implementation</b>			
Barrier	Poor coordination between industry and government, poor public communications	ICF may be used to support capacity building and advisory services to strengthen the quality of implementation	From EUR 0.1-0.2 m, ICF may fund up to 100%
<b>O&amp;M<sup>33</sup></b>			
Barrier	Inadequate skills/ resources in responsible government agency for confirming fuel economy standard is correctly introduced in fleets (by labelling or other means)  Monitoring of high polluting vehicles to increase speed of turn over of the fleet	ICF may be used for capacity building for compliance monitoring, public communications and readying for carbon markets or similar	Up to EUR 0.5 m, ICF may fund up to 100%
Barrier	Motorists may not fully perceive the benefit of fuel economy if fuel prices are low	ICF may be used for public communications	From EUR 0.1-0.2 m, ICF may fund up to 100%
<b>MRV</b>			
Barrier	Lack of resources and capacity for MRV, absence of other financing sources/ limited access to records of new vehicle sales, models etc. from manufacturers	ICF may be used to support development of baseline and MRV methodology, conduct of MRV in first year and increase capacity	From EUR 0.1-0.2 m, ICF may fund up to 100%

<sup>33</sup> O & M Operation and Maintenance



Table 5.2 Program – Fact Sheet for Multi-Jurisdictional Sustainable Transport Program	
<b>Description:</b>	<p>National programs that incentive municipalities to implement sustainable transport measures usually set criteria and minimum actions for municipalities as a condition to access co-funding from national government. The criteria/ actions required include preparing comprehensive transport/land use strategies that prioritize sustainable transport, taking initial steps to create public transport authorities and preparing initial pilot projects with supporting business cases.</p> <p><b>Implementation of ‘on the ground’ investment would be the responsibility of municipalities</b> that may seek to involve the private sector in certain aspects of implementation and operations. Examples include: Columbia (National Public Transport Program), China (Global Environmental Facility–World Bank Urban Transport Partnership Program), Mexico (ProTram), Brasil and India (National Urban Transport Policy)</p>
<b>GHG reduction potential:</b>	Very high as ST projects and systems may be catalysed across many cities and progressively over time
<b>Co-benefits:</b>	Equity, travel time reduction, reliability improvements, societal benefits such as improved access to jobs, education and health, safety, health benefits/ air quality etc
<b>Costs:</b>	Identification/ preparation costs of the program up to EUR 1.0 million. Co-financing by ICF of city-level project preparation can vary but is often in the range 50-100% of total costs. But investment is usually the responsibility of municipalities with co-financing provided by several sources.
<b>Financing sources:</b>	As for Table 5.2
<b>Direct revenue sources:</b>	<p>Program financing sources may come from hypothecated funds (from fuel surcharges), government budget or ODA</p> <p>Direct revenue sources for sub-projects exist at municipal level and are similar to those described in the MRT Facts Sheet.</p>
<b>Financial feasibility</b>	<p>Programs may include grant components which do not need to be reimbursed and ODA loan components that need to be paid back. Public financing is realized from conventional taxation and other government revenue sources (resource taxes, excise duties).</p> <p>Financial feasibility of sub-projects at municipal level is similar to that described in the MRT Facts Sheet. ST program as a whole may incentivise cities to improve land taxation and value capture with/ without comprehensive local government financing reforms promoted by national Ministries of Finance.</p>
<b>Economic feasibility</b>	Economic feasibility of projects is similar to that described in the MRT Facts Sheet. The ST program as a whole is likely to produce benefits that greatly exceed the investment provided the programme is well designed.

Table 5.2 Program - Fact Sheet for Multi-Jurisdictional Sustainable Transport Program			
Main barriers and risks by stages of project cycle		Recommended use of ICF	Approximate cost range
<b>Identification/ concept</b>			
Barrier	Program concept overly ambitious and/or too lenient requiring little effort by municipalities, to attract financing	ICF may fund whole or part of identification/ concept development through examination of current experiences domestically, internationally and accounting for national and municipal capacities	From EUR 0.1-0.2 m, ICF may fund up to 100%
<b>Preparation</b>			
Barrier	National government underestimates the work needed to prepare a sound program – backed by sound policy, technical guidance and resources for supporting municipal level project preparation to a suitable standard	ICF may 'top up' finance to enable comprehensive program preparation	Up to EUR 0.5 m, ICF may fund 50% - 100%
<b>Procurement/ transaction advisory services</b>			
Barrier	Municipalities lack of knowledge in national/ international competitive tendering practices, new technologies for a jurisdiction and how best to engage the private sector – refer MRT Facts Sheet	ICF may be used to provide a pool of funds and resources to assist municipalities with procurement mechanisms basis plus capacity building services on a needs basis	Up to EUR 0.2 m/ year per municipality, ICF may fund 50% - 100%
<b>Construction/ implementation</b>			
Barrier	High investment project-level barriers (high cost, exchange rate risk, impact of delay on financing)	Co-funding from national government may include element of grant and/or concessional loan provided by ICF	Context specific
Barrier	Lack of capacity to ensure quality of implementation	ICF may be used to support capacity building and advisory services to strengthen the quality of implementation	Up to EUR 0.2 m/year per municipality, ICF may fund up to 100%
<b>O&amp;M</b>			
Barrier	Time-limited demand guarantees for new projects – refer MRT Facts Sheet	ICF may be used to co-finance a time-limited minimum demand guarantee available to 'green fields' projects	Context specific
<b>Table 5.2 Program - Fact Sheet for Multi-Jurisdictional Sustainable Transport Program</b>			
Barrier	Unclear/unstable political environment	ICF may be used to create an insurance that mitigates the political risk	Context specific

Barrier	Non-financial barriers (e.g. regulatory barriers, lack of information/ capacity)	ICF may be used to address priority barriers	From EUR 0.2-0.5m, ICF may fund up to 100%
MRV			
Barrier	Lack of resources and capacity for MRV, absence of other financing sources	ICF may be used to support development of baseline and MRV methodology, conduct of MRV in first year and increase capacity	Up to EUR 0.5 m, ICF may fund up to 100%

**Table 5.3: Project - Fact Sheet for Mass Rapid Transit (Bus/ Rail)**

<b>Description:</b>	First MRT system in a developing city. Normal bus or mini-bus services are presently the main public transport mode, but whose performance is degraded by traffic congestion.
<b>GHG reduction potential:</b>	Dependent on patronage, energy choice, length and integration of BRT/LRT line with other modes, origin of mode shift etc.; potentially significant cumulative reduction over life time – e.g. 1M tonnes or more GHG over 20 years.
<b>Co-benefits:</b>	Equity, travel time reduction, reliability improvements, societal benefits such as improved access to jobs, education and health, safety, health benefits/ air quality etc.
<b>Approximate Investment</b>	Bus Rapid Transit – EUR 5-10 million per km Rail – EUR 50 – 150 million per km
<b>Financing sources:</b>	<p><u>Domestic public finance:</u> usually represents a large portion of infrastructure investment</p> <p><u>ODA:</u> MDB loans to public/government entities are often used as a key source of investment in project infrastructure, export credits may be provided bilaterally to fund rolling stock (trains/ buses).</p> <p><u>Private sector:</u> source of investment in infrastructure, rolling stock and operations via an appropriate concession structure (Public Private Partnership, PPP) where the risk is completely transferred to the private sector with limits on the public involvement, and requires complex arrangements and time frames on the ownership of public assets.</p> <p><u>Public Private Partnerships (PPPs):</u> can now take many forms and are an increasing used mechanism for building (such as Design, Build, Operate, Transfer) or for operations under a franchise, availability payments (payment for provision of specified transport services, provision of infrastructure/facilities and other types of services) or net cost based contract (those where fare revenue is the sole or only source of revenue).</p> <p><u>New mechanisms such as city wide or climate bonds/ themed bonds</u> are also increasing being used. The 'green' or climate credentials bring these into to universe of climate finance.</p>

Table 5.3: Project – Fact Sheet for Mass Rapid Transit (Bus/ Rail)			
<b>Direct revenue sources:</b>		Ticket revenues, social payment (public subsidy or payment for socially disadvantaged passengers), advertising (typically less than 5% of passenger revenues). Land value capture is also a potentially valuable source of funding but may require special advantages (such as the government ownership of all land as in the case of Hong Kong MRT) or changes to the legislative environments to realise them on a significant scale. Other mechanisms such as betterment levies as in case of London's Cross Rail, or the French "Versement Transport").	
<b>Financial feasibility</b>		Typically, initial investment in infrastructure is financed by domestic budgets and ODA. ODA and bilateral export credits can be used to finance rolling stock and integrated ticketing. In many cases, direct revenue may not fully cover recurrent operation and maintenance (O&M) costs. Comprehensive land value capture mechanisms or other financial mechanisms can make significant contributions to infrastructure investments while taxes and levies can be used for operations.	
<b>Economic feasibility</b>		Large co-benefits may make MRT projects economically feasible. Welfare benefits through user benefits (passenger access improvement), travel time reductions and reliability improvements usually comprise the majority of monetised economic benefits. Monetised value of GHG and air pollution benefits usually represent less than 10% of all monetised benefits.	
<b>Main barriers and risks by stages of project cycle</b>		<b>Recommended use of ICF to overcome barrier</b>	<b>Approximate cost range</b>
<b>Identification/ concept</b>			
<b>Barrier</b>	Concepts poorly shaped or follow conventional lines focusing only on roads	ICF may fund whole or part of identification/ concept development through pre- and feasibility studies.	From EUR 0.1-0.2 m, ICF may fund up to 100%
<b>Preparation</b>			
<b>Barrier</b>	Cost level for project preparation is higher than client agency normally allocates	ICF may 'top up' finance to enable comprehensive project preparation	From EUR 0.5-2.0 m, ICF may fund 50% - 100%
<b>Barrier</b>	Low financial return on investment	ICF may be used to raise awareness about value capture mechanisms in order to reduce the share of project finance that requires public spending.  ICF can be used to develop appropriate PPP contracts forms that encourage the building and operation of rapid transit so that it is fully integrated into a city's overall public transit system <sup>34</sup> .	From EUR 0.1-0.2 m, ICF may fund up to 100%  From EUR 0.5m – 1.0M for a full legal "contract deed", ICF may fund up to 100%

<sup>34</sup> Development of modern city-wide public transport system that can optimize patronage and have high external benefits requires a high level of integration of infrastructure for all modes, public transport services (bus, tram and train), and a common approach to fares and ticketing to facilitate seamless travel from A to B. Net cost contracts (e.g. Build Operate Transfer) that transfer considerable risk to private concessionaires, and where user tariffs are the main source of income to a concession, are less likely to promote a high level of integration. Availability contracts where defined infrastructure, public transport services and other requirements are procured by competitive tender have the advantage that it is easier to achieve integrated public transport systems. However, availability contracts require more capacity to develop, procure and manage than net cost contracts. One additional advantage of sound availability contracts is they would normally permit higher debt-equity ratios.

Table 5.3: Project – Fact Sheet for Mass Rapid Transit (Bus/ Rail)			
<b>Procurement/ transaction advisory services</b>			
Barrier	High transaction costs e.g. complicated procedures for international competitive bidding and/or complicated nature of project that may be the first for a jurisdiction	ICF may co-finance procurement support for project features specific measures designed to enhance GHG reduction	Up to EUR 0.5 m, ICF may fund up to 100%
<b>Construction/ implementation</b>			
Barrier	High upfront investment cost	ICF (grant/ concessional loan) may be combined with ODA to lower interest rate on loans	Context specific
Barrier	Implementation quality carries shortens project's economic life, carrying earlier than anticipated reinvestment cost and reduces project performance	ICF may support implementation supervision particularly for project types that are new to a jurisdiction	Up to EUR 0.5 m/year, ICF may fund up to 100%
<b>O&amp;M</b>			
Barrier	Demand risk is high in first few years of project O&M particularly for first rail rapid transit projects in a jurisdiction or those that require larger networks to be completed to ensure demand	ICF may be used to co-finance a time-limited minimum demand guarantee	Context specific
Barrier	Gaps in local knowledge and capacity between first and second tier city authorities.	ICF may be used to address priority barriers	From EUR 0.1-0.2 m, ICF may fund up to 100%
Barrier	Legal barriers – jurisdiction of transport ministries (e.g. between rail and road transport) or local limitations (e.g. if transit agencies may not be involved in property development, this would curtail land value capture options)	ICF may be used to address priority barriers	From EUR 0.2-0.5m, ICF may fund up to 100%
<b>Procurement/ transaction advisory services</b>			
Barrier	High transaction costs – complicated procedures and expensive regular surveys to secure ICF, lack of robust baseline data	ICF may be used to support development of baseline and MRV methodology, conduct of MRV in first year and increase capacity	From EUR 0.2-0.5 m, ICF may fund up to 100%



## 6 Conclusions

A significant change is required in almost all parts of transport related funding and financing arrangements to realize ST on the scale required for the transport sector to be in line with the 2DS. With major development needs projected for developing countries the challenges for sustainable development are considerable as recognized in the new SDGs and the United Nations Post 2015 Development Agenda. While new transport infrastructure and services will require trillions of dollars, ST solutions can substantially reduce the level of investment required, leading to cost reductions over time.

Dramatic behavioural shifts in developed economies and scaling-up of ST ‘on the ground’ in developing countries will take time but early decisions can underpin the needed transformative actions on: (i) increasing the overall availability of public funding; (ii) accelerating private sector investment; (iii) creating clear and predictable planning and investment frameworks; and (iv) harmonizing planning approaches, tools, methods and implementation procedures.

ODA, and ICF, though limited in scale can usefully support the above actions and the transition towards a sustainable, low-emission development pathway. ICF in contrast to ODA should be used more prominently to address specific climate concerns (mitigation and adaptation) but also to capture and quantify the full range of co-benefits. Specific ICF initiatives can take a lead from the Green Climate Fund (GCF) that intends that all GCF funding will be transformative.

Recommendations are made in this Discussion Paper to more systematically improve the deployment of ICF and increase its relevance for ST. The presence of many co-benefits resulting from actions on transport means that a more systematic approach to the transport sector is needed (as set out in Section 4). The impact will be larger if the limited resources are not used mainly for direct implementation but instead are increasingly used to guide policy development, leverage public and the private funding, target financial instruments and build capacity as advocated by the systematic approach advanced in this Discussion Paper.

Even with a reasonable share of available climate finance there will be a huge shortfall in transport related funding that could only come from national governments and the private sector. Financing from Multi-Lateral Development Banks, and bilateral agencies, via Official Development Assistance (ODA), will help but will be dwarfed by the overall need. It is therefore an imperative that available climate finance, as well as ODA, will be used more strategically to leverage and scale-up other public and private funding sources directed to developing more sustainable and low-carbon transport.

Leadership of the MDBs and other development partners will be needed to accomplish this major shift. They need to actively utilize their convening power and influence to effect a major shift in awareness and behaviour to recognize the seriousness of climate concerns. Influencing national decision makers on transport to understand the seriousness of climate concerns has the potential to change the way transport is prioritized, developed and funded across nations.

## Bibliography

- Adam Smith International (2014), “*Assessment of the Effectiveness of Project Preparation Facilities in Asia.*” Report prepared for the G20 Working Group. September.
- ADB (2014), “*Asian Development Fund and Infrastructure Sustainability: Building the Capacity for Asset Management.*” Prepared for the ADF Midterm Review Meeting, 12–13 November 2014, Manila, Philippines.
- Climate Bonds Initiative (2015), “*Bonds and climate change: state of the market 2015.*”
- Climate Policy Initiative (2014), “*The Global Landscape of Climate Finance.*” October.
- Flyvbjerg, B. (2004), “*Procedures for Dealing with Optimism Bias in Transport Planning, Guidance Document. Published by the British Department for Transport.*”
- GIZ (2010), “*Transport and Climate Change*” Module 5E of Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities.
- GIZ (2012), “*The Climate Financing Cascade: A NAMA financing mechanism in a nutshell.*” November
- Huizenga C, Sayeg P and Wuertenberger L (2014) “*Policy Brief: Scaling-up Sustainable, Low-Carbon Transport – overcoming financing and funding challenges, and the role of climate finance.*” Draft for Discussion, 2 December 2014
- International Energy Agency (2012), “*Energy Technology Perspectives 2012.*”
- International Energy Agency (2013), “*Global Land Transport Infrastructure Requirements: Estimating road and railway infrastructure and costs to 2050.*”
- Intergovernmental Panel on Climate Change, Working Group III – Mitigation of Climate Change (2013), “*Chapter 16: Cross-cutting Investment and Finance Issues.*”
- Institute for Transport and Development Policy and University of California, Davis (2014), “*A Global High Shift Scenario: Impacts and Potential for More Public Transport, Walking, and Cycling with Lower Car Use: Summary Findings.*”
- Lefevre, B, and Leipzier, D (2013), “*Transport Readiness for Climate Finance: A framework to access climate finance in the transport sector.*” Draft v1. Washington DC.
- Lefevre, B, Leipzier, D, and Raifman, M (2014), “*The Trillion Dollar Question: Tracking Public and Private Investment in Transport.*” Working Paper, World Resources Institute, Washington DC.
- Medda, F.R. and Modelewska, M (2010), *Land Value Capture as a Funding Source for Urban Investment: The Warsaw Metro System*, University College London.
- Nelson, D, Herve-Mignucci, M, Goggins, A, Szambelan, S, and Zuckerman, J (2014), “*Moving to Low-Carbon Economy: The Financial Impact of the Low-Carbon Transition.*” Climate Policy Initiative Transition Series.
- Partnership on Sustainable, Low Carbon Transport (2014), “*Results Framework on Sustainable Transport.*” Refer [[www.slocat.net/resultsframework](http://www.slocat.net/resultsframework)].
- Schipper L, Deakin E, McAndrews C, Scholl L, Frick KT (2009). “*Considering Climate Change in Latin American and Caribbean Urban Transportation: Concepts, Applications, and Cases: Final Report*”. Prepared by Center for Global Metropolitan Studies, University of California: Berkeley, CA: Center for Global Metropolitan Studies, University of California.
- Sheng, A (2015), “*Central Banks Can & Should Do their Part in Funding Sustainability*”. Fixing Climate Governance, Working Paper 1. Prepared for the Centre for International Governance Innovation, Canada. June. Refer [<http://ow.ly/TmpRj>].



- The New Climate Economy Report (2014), “*Better Growth Better Climate.*”
- United Nations Environment Programme, 2015. “*Inquiry into the Design of a Sustainable Financial System – The Financial System We Need: Aligning the Financial System with Sustainable Development –Policy Summary.*” Refer [[www.unepinquiry.org](http://www.unepinquiry.org)].
- UNDP (2012), “*Readiness for Climate Finance – a framework for understanding what it means to be ready to use climate finance.*”
- UN-Habitat (2013), “*Planning and Design for Sustainable Urban Mobility.*” Global Report on Human Settlements 2013. Published by Routledge.
- Walters, L.C. (2012), “*Land Value Capture in Policy and Practice*”, Stuart Gow Professor of Public Management, Romney Institute, Brigham Young University, USA.
- Tuan Minh Le, Jim Brumby, Anand Rajaram and Nataliya Biletska (2010), *A Diagnostic Framework For Assessing Public Investment Management. A World Bank Policy Research Working Paper.* Refer [<http://dx.doi.org/10.1596/1813-9450-5397>]



**Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH**

Dag-Hammarskjöld-Weg 1-5

65760 Eschborn, Germany

T +49 61 96 79-0

F +49 61 96 79-11 15

E [info@giz.de](mailto:info@giz.de)

I [www.giz.de](http://www.giz.de)



**Partnership on Sustainable Low Carbon Transport (SLoCaT)**

Far East International Plaza, B-1811

317 Xianxia Road

200051, Shanghai, China

T +86 021 5291 9855

E [secretariat@slocatpartnership.org](mailto:secretariat@slocatpartnership.org)

I [www.slocat.net](http://www.slocat.net)