

Applicability of post 2012 climate instruments to the transport sector

Interim Synthesis Consultant Report
December 2009

DRAFT

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Partnership on Sustainable
Low Carbon Transport

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1 Introduction

1. The post-2012 Climate Agreement is expected to open a new window for more ambitious greenhouse gas emissions reduction actions. It is increasingly important for the transport sector in developing countries to contribute to such mitigation efforts. Businesses as usual scenarios indicate a growth of over 100% in vehicles for the period 2012 – 2018 in most of the developing countries. Globally, governments and experts are discussing instruments that support mitigation efforts by developing countries. The proposals fall under two general categories:

- *Generate Emission Reductions which count against mitigation targets for developed countries.* This includes continuing the Clean Development Mechanism (CDM beyond 2012, but with certain modifications to enhance scale of emission reductions, lower barriers and reduce transaction costs.
- *Generate Emission Reductions which can be reported directly by developing countries to UNFCCC.* The instrument being discussed for this purpose is Nationally Appropriate Mitigation Actions (NAMAs).

2. The post 2012 Climate Instruments in the transport sector (CITS) project implemented by the Asian Development Bank (ADB), in cooperation with the Inter-American Development Bank (IDB) is a first step to help ensure that the transport sector can benefit from the revised/new climate change mitigation instruments under a post-2012 Climate Change Agreement. The CITS project is a contribution to the Partnership on Sustainable, Low Carbon Transport.

3. The CITS project is implemented over the period September 2009 – April 2010 and has the following outputs:

- a) Synthesis of information on the GHG reduction and co-benefit potential of transport interventions and existing and planned climate change mitigation instruments;
- b) Four case studies from the Asian and Latin American regions, illustrating suitable NAMAs and CDM projects in the transport sector, documented in a synthesis report;
- c) Development of an informal network, spanning both developed and developing countries, of transport organizations to help guide the discussion on detailed guidelines for post 2012 climate instruments.

4. Although the implementation of the project is still ongoing and the case studies have not been completed it was decided to produce an interim synthesis report to inform the discussions on post 2012 climate instruments at COP 15 in Copenhagen. The interim report can also serve to obtain inputs and feedback for the final report of the CITS project which is expected to be available by May 2010.

5. The format of the interim report is as follows. Chapter 2 gives an overview of the abatement potential of various types of interventions in the transport sector. Chapter 3 reviews the existing climate instruments and related climate change programs for their effectiveness and

relevance to the transport sector. An overview of the discussions on post 2012 climate instruments and their significance for the transport sector is given in Chapter 4. A synopsis of the four case studies carried out under the CITS project is given in Chapter 5. Initial conclusions and recommendations are presented in Chapter 6; this chapter also outlines the next steps to be taken in the CITS project prior to its completion in May 2010.

6. The report was written by Cornie Huizenga, Partnership for Sustainable Low Carbon Transport and Stefan Bakker, the Energy Research Center Netherlands with support from the authors of case studies: EMBARQ/World Resources Institute (Dario Hidalgo), for the Belo Horizonte case study; Wuppertal Institute (Frederic Rudolph) for the Hefei case study; Transport Research Laboratory (Holger Dalkmann and Ko Sakamoto) for the Jakarta case study; and Ecofys (Martina Jung) and for the Mexico case study). The CITS project is guided by Jamie Leather and Sharad Saxena in ADB and Rafael Acevedo-Daunas, Maria Cordeiro and Vera Lucia Vicentini in the IDB.

7. Comments on this draft interim consultants report can be addressed to Cornie Huizenga (cornie.huizenga@slocatpartnership.org) and Stefan Bakker (bakker@ecm.nl).

2 CO₂ emission reduction potential in the Transport Sector

8. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPPC) states that in 2004 the global transport sector accounted for 6 GtCO₂-eq or 13% of total GHG emissions (Kahn Ribeiro et al., 2007). In a business-as-usual scenario these are projected to increase by over 80% by 2050, with the bulk of the increase taking place in developing countries (IEA, 2009). Substantially changing this trend will require adoption of a range of available and new technologies as well as changing travel patterns. Strong policies are needed to achieve this.

2.1 Avoid - Shift - Improve framework

9. The nature of sustainable transport policy measures varies, but they can generally be seen to contribute to at least one of three fundamental strategies: (Dalkmann and Brannigan, 2007)

- Avoiding the need to travel (Avoid);
- Shifting travel to more sustainable modes (Shift); or
- Improving the sustainability of modes (Improve).

10. Transport policy instruments can be further divided into categories: planning, regulatory, economic, information and technological, as shown in Figure 1.

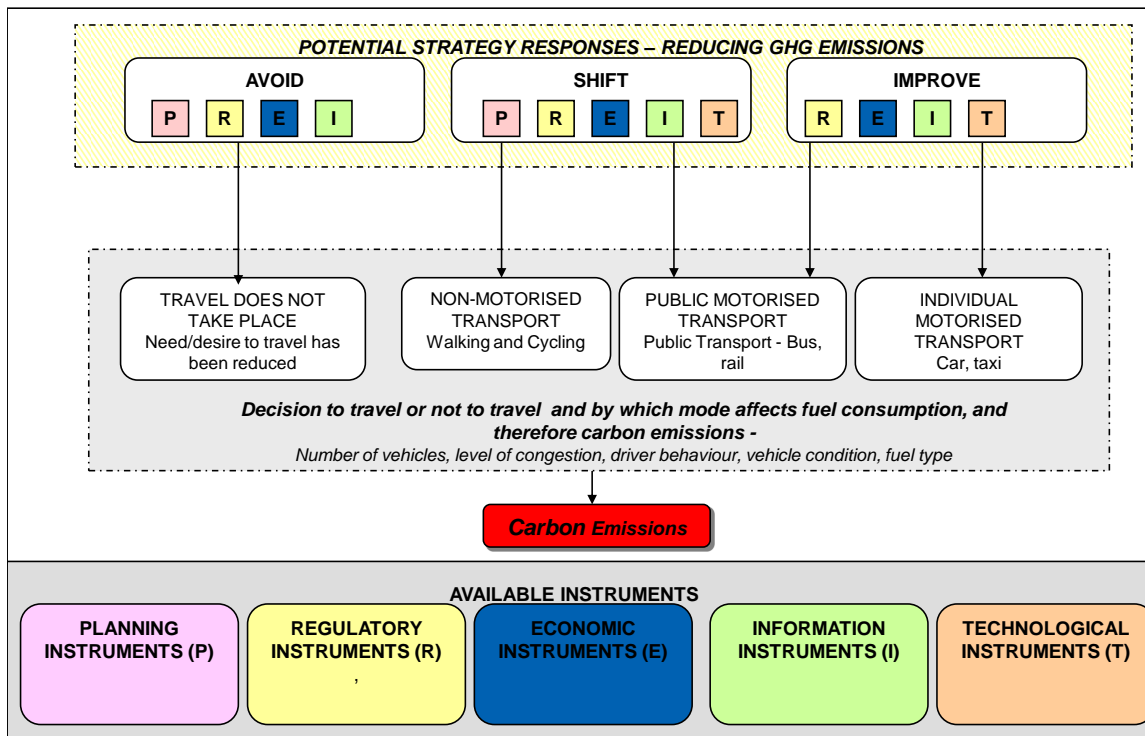


Figure 1: Strategies and instruments to reduce carbon from transport (Dalkmann and Brannigan, 2007).

11. In current policy effort as well as published literature on potential of emission reductions in transport, the category 'Improve' dominates. In its overall potential assessment the IPCC concludes '(t)he mitigation potential by 2030 for the transport sector is estimated to be about 1600–2550 MtCO₂ for a carbon price less than 100 US\$/tCO₂. This is only a partial assessment, based on biofuel use throughout the transport sector and efficiency improvements in light-duty vehicles and aircraft and does not cover the potential for heavy-duty vehicles, rail transport, shipping, and modal split change and public transport promotion and is therefore an underestimation (...) (low agreement, limited evidence)' (Kahn Ribeiro et al., 2007). It however acknowledges that integrated transport and land-use strategies including transport demand management and modal shift measures can be effective if rigorously implemented and supported. It also notes that the demand for vehicles, vehicle travel and fuel are significantly inelastic and therefore price increases need to be substantial to make a difference in GHG emissions. The World Energy Outlook (IEA, 2009) does not explicitly consider avoid and shift measures.

12. In recent studies the need for policies focussing on 'Avoid' and 'Shift' in order to achieve the necessary emission cuts is further acknowledged (Johansson, 2009; Hoen et al., 2009). Overall, however, these still play a relatively small role in the overall policy effort. In the Blue shifts scenario variant of the IEA publication "Moving towards sustainability" (IEA, 2009) demand reduction and modal shift in passenger and freight transport result in a 20% CO₂ emission reduction compared to the baseline¹. The bulk of the reductions required to achieve an overall 50% decrease in emissions in 2050 compared to 2005 come from vehicle efficiency, and alternative fuels. (Hoen et al., 2009) estimate that road pricing, spatial planning and mobility management (telecommuting, flexible working hours) could reduce passenger travel demand in the Netherlands by 15%, 2% and 10% respectively.

13. For the freight sector there is a lack of information, but it is acknowledged that influencing the distance travelled is even more difficult compared to those of private vehicles. In McKinsey (2009) measures related to distance travelled accounted for 3% of the total global CO₂ reduction potential in 2030, while no modal shift measures are included.

14. It is generally acknowledged that, compared to technological options², the barriers for the options involving behaviour change are not as well understood and the reduction potential for these options is therefore surrounded by large uncertainties (Gross et al., 2009). In a meta-analysis of mitigation potential across 46 models in six countries, Clapp et al. (2009) note that the models may underestimate the abatement potential in the transport sector as they do not take into account behaviour changes and modal shift. The abatement cost per tonne of CO₂ for these types of measures however is often low, or negative, even excluding co-benefits (OECD, 2005).

15. Transport policy measures can be implemented at different policy levels. Local policy often has a large degree of autonomy when it comes to issues such as parking and public transport. Also the link with sustainable development is most visible at the local level, e.g. through urban air quality and congestion problems. Moving towards sustainable transport can

¹ However the impact is smaller in case the transport sector is already decarbonised by technical means

² Several of the studies referenced in this section define technology in a manner which focuses on vehicle engine and fuel technology. It is important to acknowledge that technology also includes ICT and other forms of technology which help function the overall transport sector more efficiently and effectively.

be done through project, programmes or projects³. A sustainable transport approach requires comprehensive packages of interventions on all levels (national and local). Table 1 gives a rough characterisation of the differences in transport options according the ASI model, as well an indication of the mitigation potential.

Table 1. *General characterisation of ASI options and mitigation potential.*

Governance level / Intervention type	National	Regional	Local
Avoid	Policy **	Policy *	Policy/program **
Shift	Policy/programme **	Programme/project *	Policy/programme/project ***
Improve	Policy ***		Project *

Potential to reduce GHG emissions in the transport sector: *** high, ** medium, * low. Source: adapted from ADB (2009); authors. It should be noted that there is also a time dimension: the impact of measures on emissions in time differs for different policies and measures.

16. The bulk of the studies related to mitigation in the transport sector is for Annex I countries. In addition these studies are most often more detailed in their quantitative and qualitative analysis. Marginal abatement cost curves for developing countries developed in the late 1990s and early 2000s in the framework of CDM strategies often include only a handful of transport options, which are mainly related to vehicle efficiency, fuel switch and bus rapid transit systems (Bole et al., 2009). McKinsey (2009) developed a cost curve for India which includes mileage standards, biofuels, integrated planning, modal shift in the freight sector, public transport, electric vehicles and hybrids. The Indonesian Technology Needs Assessment includes several emission scenarios developed from bottom up data of vehicle quantities and mitigation options such as hybrids, fuel switch and modal shift (Republik of Indonesia, 2009; 260 and before). A World Bank study conducted in support of the national climate plan in Mexico (Programa Especial de Cambio Climatico 2008-2012, PECC) includes a transport cost curve for Mexico which covers, among others, 9 transport interventions (Urban densification, BRT system, NMT, Bus system optimization, vehicle fuel efficiency standards, Inspection and maintenance, border vehicle inspection, road freight logistics, railway freight) (Johnson et al. 2009).

17. The relative lack of detailed studies in developing countries so far may be explained by lack of resources, general low data availability on the transport sector, as well as a generally low priority towards GHG reduction as a goal in itself. (ADB, 2009). To assess ex ante and ex post the impact of policy intervention there is a need for more detailed activity data and time series, including consumer behaviour at the local level. This may be resource intensive and requires

³ A project is a single activity clearly defined in space and time. A programme is a larger set of (often smaller) activities spread over time and space (e.g. several BRTs in several cities), and is often used to implement a policy. A policy is the establishment of incentives to achieve policy goals (e.g. tax cuts).

significant capacity building and overhaul of transport data collection procedures and mechanisms.

18. In terms of mitigation options and policy measures, compared to developed countries, developing countries may have, inter alia (ADB, 2009a; Huizenga, 2009a):

- A lower, but fast increasing, level of vehicle ownership
- Older vehicles and lower vehicle emission standards
- Higher population density
- A higher, but often declining, share of non-motorised and public transport in overall distance travelled
- A higher share of motorized two and three wheelers in the vehicle fleet
- Higher urban air pollution levels, congestion and road accidents
- Poor transport data
- Lower spatial planning capacity

19. ADB (2009a) notes the potential for developing countries to leap-frog to integrated cleaner transport systems, rather than follow the same unsustainable path as developed countries have done. The more intense transport problems developing countries face may provide an opportunity to move faster to a sustainable transport future.

2.2 Co-benefits

20. Transport policies and programs usually target several policy objectives including improving mobility, reducing congestion, improve air quality, security of supply and climate change mitigation. Benefits can be distinguished into (ADB, 2009a):

- *Benefits* –the primary intentional goal of policies and project (e.g. reduced traffic congestion),
- *Primary co-benefits* - other benefits that directly result from transport policies or projects (e.g. GHG and air pollution reduction);
- *Secondary co-benefits* - benefits that indirectly result from transport policies or project (e.g. reduced health impact and costs from air pollution).

21. “The (ASI) approach will bring about different co-benefits, and these co-benefits may be different between developing and developed countries. Developing cities are dominated by large numbers of old high polluting vehicles and the policies focusing on “improve” will have relatively high co-benefits. With many cities in developing countries yet to develop a strong planning capacity, planning instruments such as efficient mix of land use-transport-environment can bring about higher co-benefits compared to developed cities. Similarly, in developing countries, regulatory and planning instruments targeting the freight sector can bring relatively large and immediate co-benefits compared to developed countries” (ADB, 2009a).

22. Some specific studies show the large size of the co-benefits of sustainable transport projects and policies. For instance, at the programme level, James Woodcock, et Al. (2009) estimate the health effects of alternative urban land transport scenarios for London, UK, and Delhi, India. The authors noted that “reduction in carbon dioxide emissions through an increase in active travel and less use of motor vehicles had larger health benefits per million population (7332 disability-adjusted life-years [DALYs] in London, and 12 516 in Delhi in 1 year) than from the increased use of lower-emission motor vehicles (160 DALYs in London, and 1696 in Delhi).

However, combination of active travel and lower-emission motor vehicles would give the largest benefits (7439 DALYs in London, 12 995 in Delhi), notably from a reduction in the number of years of life lost from ischaemic heart disease (10–19% in London, 11–25% in Delhi).” The authors conclude that “policies to increase the acceptability, appeal, and safety of active urban travel, and discourage travel in private motor vehicles would provide larger health benefits than would policies that focus solely on lower-emission motor vehicles.”

23. At the policy level, CTS Mexico (2009), show that in the context of Mexico sustainable transport national strategies bring large GHG pollution reduction potential, and result in negative net social costs (i.e. positive impacts) for a society as whole (Figure 2.). The only intervention which has taken as a whole positive social cost is bus hybridization.

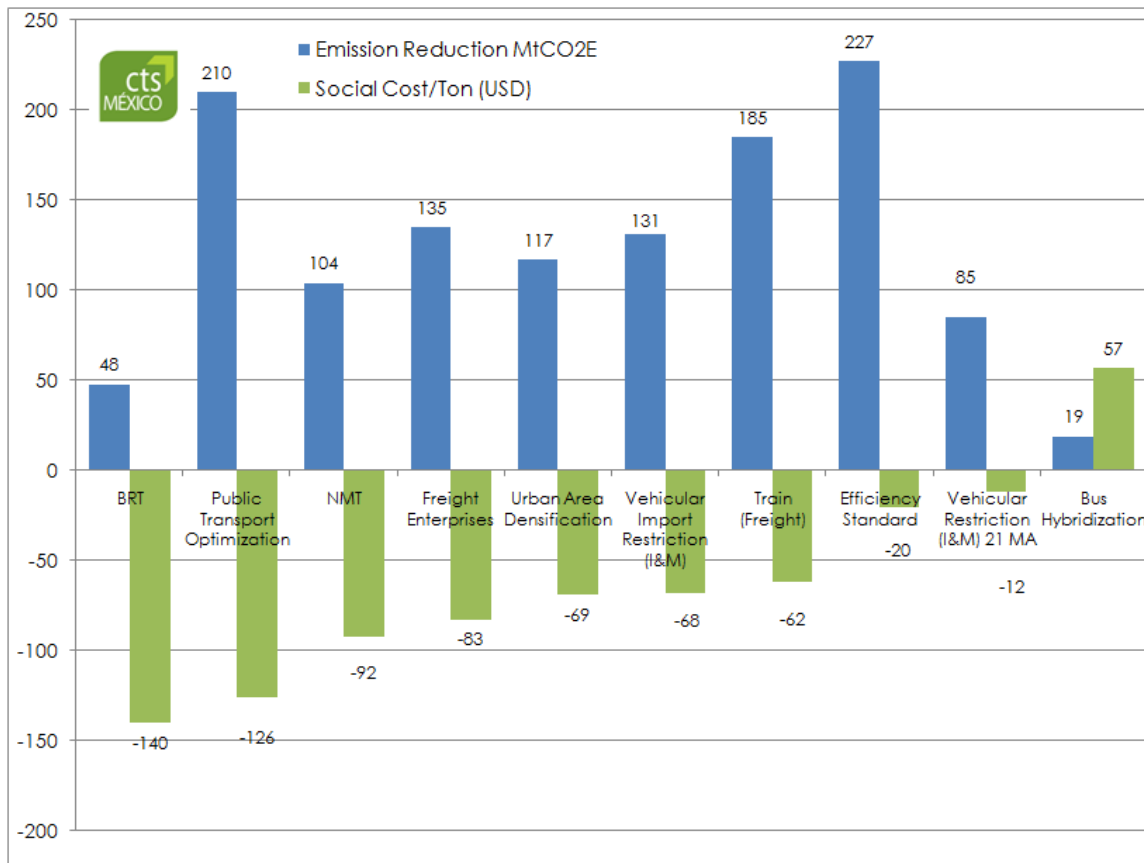


Fig. 2: Emission reduction potential and associated social costs (Johnson et al. 2009)

24. At the project level, INE (2008) quantifies the most important environmental and economic benefits of a bus rapid transit corridor in Mexico City, Metrobus, whose initial 20 km started operations in July 2005. Over a 10 year period, the authors estimate a reduction of 280,000 tons of carbon dioxide emissions, and net benefits from health impacts, travel time and project costs of USD 12.3 million, using a discount rate of 7%.

25. A special type of co-benefits could be linked to those emissions that contribute to climate change but are not included in the Kyoto gases, notably black carbon and ozone⁴. The transport sector is an important source of these substance, either by directly (PM) or indirectly (ozone formation from tailpipe emissions).

26. Quantification of co-benefits remains however challenging, and often subjective, with no widely accepted approach present as yet. Even on the level individual co-benefits, e.g. health benefits of improved air quality, different methodologies are being used, let alone for other areas such as energy security or reduced congestion. In addition to the methodological difficulties, lack of activity data is a barrier towards co-benefit quantification. ADB (2009a) has however proposed an approach towards explicitly including transport related co-benefits in policy evaluation, based on sustainable development priorities of a country, and ex ante and post assessment of benefits. Japan Ministry of Environment (2009) developed an assessment framework and methodology including qualitative and quantitative indicators for co-benefits of GHG reduction measures.

27. Olsen and Fenhann (2008) have reviewed the sustainable development criteria and processes for approval of CDM projects used by Designated National Authorities in various countries. They also proposed a taxonomy for assessment of sustainable development benefits from CDM projects which includes economic, social, environmental and other benefits. Other studies and reports that address methodological issues on the assessment of sustainable development benefits of CDM projects include Sutter (2003) and Schneider (2007).

28. In the climate change context there is a need for further discussion how to integrate the co-benefits approach in a future climate regime without creating another barrier for funding because of increasing complexity of MRV procedures.

3 Applicability of Existing Climate Instruments to the Transport Sector

3.1 CDM

29. The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment (called Annex 1 countries) to invest in ventures that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. Proposed projects have to use a baseline and monitoring methodology approved by the CDM Executive Board to show how the emission reductions are derived. Another crucial feature of an approved CDM carbon project is that it has demonstrated that the planned reductions would not occur without the additional incentive provided by emission reductions credits, a concept known as "additionality" (UNFCCC, 2005). Since 2005, larger sets of similar projects can be developed under the CDM as Programmes of Activities (PoA).

⁴ One important reason to address black carbon and ozone is that these have a much shorter life-span than CO₂ as warming agents. The long(er) term impact of aerosols is still uncertain.

30. The transport sector has played a very limited role in the CDM. As of December 2009, 24 projects out of 4782 project in the pipeline are related to transport (including biofuels) (UNEP/Risø, 2009). They are expected to reduce 2.9 MtCO₂-eq/yr up to 2012, or 0.4% of the total reductions of the current pipeline. Table 2 shows the transport projects broken down by approved methodology.

Table 2. Transport projects in the CDM pipeline, December 2009.

Methodology	No. of projects	Expected GHG reduction up to 2012 (ktCO ₂ -eq/yr)
AM47, version 2: Production of biodiesel based on waste oils and/or waste fats from biogenic origin for use as fuel (February 2007)	3	666
ACM17 Production of biodiesel for use as fuel (October 2009)	1	262
AMS.III-T. Plant oil production and use for transport applications (2008)	1	19
AM 31 Baseline Methodology for Bus Rapid Transit Project (July 2006)	7	1122
ACM16 Mass Rapid Transit Projects (October 2009)	1	583
AMS.III-U. Cable Cars for Mass Rapid Transit System (MRTS) (September 2008)	1	17
AMS.III-C. Emission reductions by low-greenhouse emission vehicles (2006)	9 + 1 PoA	234
AMS.III-AA. Transportation Energy Efficiency Activities using Retrofit Technologies (May 2009)	0	0

Source: UNEP/Risø (2009)

31. The current underrepresentation of the transport sector can be explained by the following barriers (adapted from ADB, 2009a; Millard-Ball and Ortolano, 2010):

- The difficulty in determining additionality, e.g. due to the small share of CER revenues in the total project cost;
- Difficulty in establishing the baseline scenario, due to the fact that transport projects contribute to a multitude of goals;
- Emissions from individual sources are relatively small and dispersed, making monitoring difficult;
- Extensive linkages to other economic activities (makes it more difficult to give boundaries to a project);
- Transport's strong relationship with human behaviour (which can make evaluation difficult);
- Lack of uniformity in Meth Panel recommendations;

- Specifically for biofuels: difficulty in determining life cycle emissions.

32. These barriers explain the fact that few methodologies have been approved in the transport sector, even though a larger number have been proposed since 2005. (Millard-Ball and Ortolano, (2009) give an overview of all methodologies submitted and their approval status. In addition experience has shown that applicability of approved methodologies has been difficult, e.g. for BRT projects using AM31, which has been approved in 2006, and biodiesel from waste fats using AM47 (approved in 2007). Recently these methodologies have been consolidated in ACM16 and ACM17, which are used by one project each, one month after their approval.

33. The recent increase in approved methodologies can be seen a sign that there is scope for more transport projects in the CDM. However the CDM is being criticized for including projects that would have happened anyhow (i.e. non-additional projects), and transport projects are among those having problems demonstrating additionality.

3.2 Financial institutions and programmes

34. Several development banks and multilateral funds offer financial assistance to transport projects and programmes. These include the World Bank (WB) and the Clean Investment Fund (CIF), (multilateral) development banks in Asia, Africa and Latin America, and the Global Environment Facility (GEF) used as the Financial Mechanism of the UNFCCC. This section reviews their performance, in particular the type of activities supported and their successfulness to promote sustainable transport.

35. In 2000, the GEF Council approved Operational Program #11 (OP 11 – “Promoting Environmentally Sustainable Transport”), a program aimed at enhancing efforts in the transport sector. As of April 2009, the GEF has funded 37 transportation projects in more than 73 cities worldwide, thereby being the largest sustainable urban transport programme in the world. Initially, GEF support to the transport sector focused on technological solutions. However GEF-4 (2006–10) emphasizes “non-technology” options, such as planning, modal shift to low-GHG-intensive transport modes, and promotion of better managed public transit systems. The new strategic program on “sustainable innovative systems for urban transport” prioritizes countries with rapidly growing small and medium-size cities, which includes urban planning, public transport investments (particularly BRT), TDM and national policy development (GEF, 2009a).

36. During this period, the GEF has allocated approximately \$201 million to sustainable urban transport projects, with an average of \$5.4 million per project. This funding has been supplemented by more than \$2.47 billion in co-financing⁵. This co-financing ratio of 1 to 12.3 is the highest in all GEF programs as it often requires large-scale investments to develop infrastructures. Figure 3 shows that the portfolio is quite diverse, with substantial in BRT, vehicles and NMT (‘other’ refers to capacity building, planning, awareness raising and policymaking).

⁵ Co-financing as recorded by GEF is based on voluntary reporting which is not subject to validation.

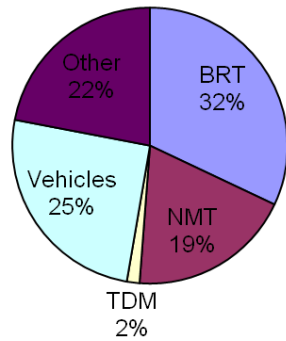


Figure 3. GEF Transport funds breakdown (ITDP draft Oct 09)

37. Estimating these projects’ impact on CO₂ emissions is difficult (ITDP, 2009). Project documents indicate an expected direct CO₂ reduction of 31.5 MtCO₂, and an expected indirect CO₂ reduction of 34.5 MtCO₂. The projects are implemented by the World Bank, UNEP and UNDP (GEF, 2009a). On technology transfer, GEF (2008) reports on support of BRT, electric three-wheelers, hybrid buses, fuel cell buses and TDM.

38. The World Bank (WB) has provided more than \$30 billion (\$ 2 – 5 billion / yr) project lending to the transport sector in the past decade, or over 15 percent of its total lending commitments. The average project size was \$150 million in 2005. Three-quarters of this go to roads, as shown in Figure 4. Transport lending in the ADB in the period 2004 – 2008 was on average \$ 2.19 billion per year of which 81% was for Roads and Highways. The focus on roads in transport lending is similar for other development banks such as ADB and IDB. It is expected that transport lending will increase to \$ 5.89 billion per year in the 2009 – 2011 period and the relative share of Roads and Highways will decrease to 66% (Duncan, 2009). The IDB in 2008 provided \$ 2.2 billion of lending to the transport sector of which 87% was for roads. (Taga, 2009). A recent Stockholm Environment Institute working paper reports that four major bilateral and multilateral development organizations (Agence Française de Développement, the German Development Bank, the Japan International Cooperation Agency the European Investment Bank) in 2008 channeled € 8 billion in climate financing (both ODA and non-ODA) of which 32% was for mitigation in the transport sector (Atteridge, 2009).

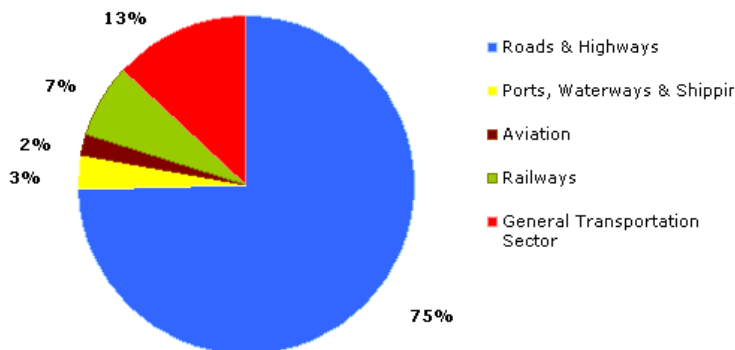


Figure 4. World Bank transport project lending breakdown in 2007 (World Bank, 2009⁶)

⁶ <http://go.worldbank.org/KM9OPODLQ0>

39. The WB provides two percent of total infrastructure spending in developing countries. In an evaluation IEG (2007) recommended the WB to reconsider its priorities and try, wherever possible, to make a difference by demonstrating new approaches. This includes multimodal freight project and sustainable urban transport. Barriers however include lengthy preparation time, and the lack of support and incentives for staff to get involved in more intricate projects, and the WB's current restrictions on subsovereign lending⁷. In addition, programmatic approaches may be promising for enhanced development support in transport and related sectors, but their outcomes have not been evaluated fully. The approaches could result in greater country ownership, better policy dialogue, and more transparency, and may also be better suited for more effective capacity building and knowledge dissemination, an area where the WB has not fared well.

40. The IDB is developing a Regional Environmentally Sustainable Transport Strategy (REST –CC Strategy) aimed to implement a sustainable pathway for transport in the Region that limits GHG-emissions from this sector and minimizes other negative externalities, fostering economic growth and social inclusion (Huizenga, 2009b). The ADB has developed a Sustainable Transport Initiative (STI) which aims 'to align transport investment with emerging challenges, by supporting: (a) Inclusive Economic Growth, (b) Environmentally Sustainable Growth, and (c) Regional Integration (Yao, 2009). The ADB STI is oriented on the ASI approach.

41. Development Banks have provided policy-based or program lending since the 1980s, in order to address policy and institutional reforms. In Africa this has contributed to positive economic and policy reforms (AfDB, 1997). ADB (2007) concludes that overall performance at evaluation is lower compared to ADB supported investment projects. Of the program loans approved since 1996 public policy program loans had a 61% success rate. Program lending appears to have performed better in countries with policy and institutional environments that are amenable to reform, and where stronger institutions are in place to manage the required changes.

42. A special fund established by the ADB in 2007 is the Clean Energy Financing Partnership Facility (CEFPF). Its budget for 2007-2008 was \$33 million. Funded energy efficiency and renewable energy projects, including technical assistance, are estimated to reduce GHG emissions by 3.6 MtCO₂-eq/yr. (ADB, 2008). As of mid 2008, out of 17 there was one transport related project (energy efficiency in railways).

43. In 2008 the Climate Investment Fund (CIF) was established by the World Bank in cooperation with the multilateral Development Bank. Two strategic funds were set up under the CIF: Clean Technology Fund (CTF, see also 4.2.2) and the Climate Change Fund. The CTF is designed to fill an immediate financing gap before further details of the future climate regime are worked out, and it seeks to demonstrate how financial and other incentives can be used to scale up clean technology deployment and transfer. For the transport sector it focuses on modal shift, fuel economy and fuel switch (WB, 2008). Currently programmes in Vietnam, Philippines, South Africa, Mexico and Thailand are being considered for funding which include BRT, rail systems, vehicle technology and biofuels components (WB, 2009). It is too early to do a performance analysis.

⁷ Traditionally multilateral development banks loans have been with national governments. Under subsovereign lending loans can also be made to local governments.

Box 1: Clean Technology Fund – Transformational Impacts

The discussion on the detailed shape of NAMAs (and relevance for the transport sector) should take into account the experiences of the Climate Investment Fund and Clean Technology Fund. An important criterion for these funds has been the “transformational” character of projects supported by these funds. The transformational nature of the Clean Technology Fund is expressed by “how concessional financing at scale could leverage a shift to low carbon technologies across a sector or sub-sector, or demonstrate global application of a low-carbon technology”. (World Bank, 2008c)

In the transport sector there is now a discussion now within the CTF whether BRT is sufficiently transformational and whether BRTs should be supported in the program. Some argue that BRT is increasing Business as Usual and therefore should not be supported by the Clean Technology Fund. Others argue that while MDBs have increasingly embraced BRTs this is not yet the case by many of the stakeholders and that even cities that are willing to adopt BRT face considerable barriers which the Clean Technology Fund can help to overcome. Also, increasingly BRT is being combined with other components such as integration of land use, other public and private transport systems and thus a much broader assessment and delivery of a total transport solution⁸. In the case of Mexico support to BRT was linked to scrapping of old buses.

Some observers commented that for the transformational impacts envisaged by the Clean Technology Fund to occur, the CIFs should do more to cover improvements in sectoral governance, institutional capacity, and policy and regulatory environments in the current draft CTF results measurement framework (Nakhoda, 2009).

44. From this chapter it appears that the CDM under the current rules is not likely to play a major role in a shift to sustainable transport systems, although PoAs may result in some opportunities. Other financial mechanisms have put in a larger share of their resources in the transport sector, both for lending and grants, but mainly in road infrastructure. Since the turn of the century there is a tendency to look at transport more holistically and invest more in modal shift. Capacity building and policy support are key areas where support is needed, even though the impact on emissions is difficult to quantify.

⁸ This is currently being attempted in an ADB supported CTF proposal for Viet Nam (personal communication Jamie Leather, ADB).

4 Instruments under development under development

45. As part of the ongoing negotiations on a new Climate agreement revisions to CDM are being considered. NAMAs are a new instrument being discussed.

4.1 CDM and New Emission Trading Mechanisms

46. The discussions on the future of CDM and similar baseline-and-credit models are conducted in the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) which was set up in December 2005⁹. The AWG-KP is set to complete its work by the end of 2009.

4.1.1 Developments and Trends

47. There are a number of themes and proposals that come up frequently in the discussion of CDM and which will contribute to shaping the future of CDM¹⁰:

- There is a desire among some groups, especially developed countries, to increase the level of off-setting of emissions in developed countries through expanded CDM. This could help towards realizing more ambitious emission reduction targets in developed countries. Another argument given is that this would promote financial transfers to developing countries. With respect to the latter, the European Commission estimates that by 2020 developing countries are likely to face annual costs of around €100 billion for mitigation and adaptation and that between €22-50 billion will be needed annually for international public finance to pay the costs by 2020: the EU could contribute €2-15 billion annually, and the international carbon market might provide up to €38 billion annually (European Commission 2009)¹¹.
- Other groups, including some developing countries and NGOs, argue that the amount of emission reduction in developed countries to be achieved by offsetting of emission (e.g. through CDM) should be limited. Their main argument is that this would help promote domestic action by developed countries. It has been suggested to limit off-setting achieved from projects in emerging economies (currently the main recipients of funding generated through CDM) and prioritize off-setting achieved through projects implemented in least developed countries.
- Strengthen efficiency, predictability, consistency and transparency in CDM management process. This could increase the volume of CDM projects.

⁹ See http://unfccc.int/kyoto_protocol/items/4577.php

¹⁰ This section is based on Center for European Policy Studies (2009); Sanchez (2008); UNFCCC (2009a); UNFCCC (2009b); and UNFCCC (2009c)

¹¹ In 2008 transactions by the (primary) CDM recorded 389 MtCO₂e in volume and \$6,519 million in value (Capoor & Ambrosi, 2009)

- Improve regional distribution. Four countries currently account for more than 80% of all CDM projects. China alone accounts for 59% of expected average annual CERs from registered projects by host party, followed by India (11%), Brazil (6.5%) and the Republic of Korea (4.6%).
- Differentiation among countries and project types to improve regional and sectoral balance: (a) positive lists with respect to additionality, b) negative lists: excluding countries or project types from the CDM, (c) preferential treatment in procedures, access to resources; (d) CER discounting whereby one tonne CO₂-eq reduced equals more or less than one CER, e) caps on CER issuance or allocation of CER demand to certain countries or sectors.
- Better recognition of environmental co-benefits and the contribution to sustainable development. Currently the appraisal of the contribution of CDM projects is done separately from the appraisal of its contribution to GHG emission reduction and is the responsibility of Designated National Authorities in the developing countries. There are no standardized methodologies and there is no regular reporting on the contribution of CDM projects to sustainable development. (Olsen and Fennhann, 2008). Given the overall limited amount of CERs generated in the CDM, its contribution to global sustainable development and tech transfer has been limited.
- To enhance the environmental integrity, efficiency and regional distribution of the clean development mechanism, define standardized baselines for specific project activity types, and specific sectors or subsectors
- Further facilitate the use of Programme of Activities (PoA), also known as Programmatic CDM. PoA is a voluntary action, coordinated by a private or public entity, implementing a policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), resulting in measurable GHG emission reductions, or avoidance that are additional to any that would occur in the absence of the PoA¹². PoAs increase the possibility to register a set of activities of the same type in a wide area under a single 'programmatic' umbrella. The rationale behind this new modality is to enhance the efficiency of the operation process, and increase its applicability as well as the volume of credits. It is also expected to facilitate access on the part of countries without a track record to the CDM by allowing the re-grouping of single projects that would otherwise be too small to be commercially attractive or viable.
- Sectoral benchmarking in the CDM establishes a dynamic baseline based on a pre-determined benchmark (e.g. for emissions per tonne of production) for a whole sector (e.g. cement, power and steel have been suggested) or sub-sector in a country or a region. Sectoral benchmarking in the CDM could improve environmental integrity as well as predictability by demonstrating additionality and setting the baseline with stringent and differentiated pre-determined benchmarks.

¹² Source: CDM Rule Book - <http://cdmrulebook.org/pageID/452>

- Discussions on a possible sectoral crediting mechanism¹³ suggest that it will be possible to credit emissions reductions from a covered sector against a threshold possibly below the business as usual scenario. Thresholds represent country performance and can be expressed in absolute (e.g. GHG emissions in sector x) as well as intensity terms (e.g. GHG emissions/ton of cement). Sectoral crediting is however different from CDM as credits would be issued to the respective developing country government which would have to provide the incentives for emission reductions to take place. Sectoral crediting based on no-lose targets¹⁴ intends to encourage emissions reductions (orchestrated by the host country) in a key emitting sector in developing countries. A technical merit of sectoral crediting is its circumvention of the additionality test on a project basis. Sectoral crediting assesses the performance of a whole sector instead of individual activities, although monitoring will still need to be performed at an installation level for aggregation into a sector level.

4.1.2 Relevance for the transport sector

48. Table 3 gives an overview of the possible impact of the changes to CDM currently being discussed on the transport sector. The largest impact can be expected from efforts to differentiate CDM through a positive/negative list; acknowledging more fully environmental benefits; standardized base lines; PoAs; sectoral benchmarking and sectoral crediting. With all of these possible changes it is important to keep in mind the need to prove the emission reductions. After all these are traded commodities which have a direct impact on often legally binding emission reduction targets in developed countries.

Table 3. Relevance of CDM trends for the Transport Sector

Development - Trend	Potential Impact on Transport Sector	Remarks
Increase off-setting	+	<ul style="list-style-type: none"> Increase in demand for CERs can result in greater willingness to consider and address the specific requirements of the transport sector
Quantitative limits to off-setting for Annex I countries	-	<ul style="list-style-type: none"> Limits to offsetting could mean a de facto exclusion of the transport sector, as others are more attractive.
Functioning of CDM systems	o	<ul style="list-style-type: none"> Neutral effect. Better functioning of CDM system will not specifically benefit the transport sector
Decrease geographical concentration	o	<ul style="list-style-type: none"> Neutral effect. The transport sector will not specifically benefit from measures to address the

¹³ Beside sectoral crediting, also sectoral targets are discussed in the negotiations. The difference to crediting is that targets lead to the issuance of allowances ex ante and imply compliance, while credits within a sectoral crediting mechanism are issued ex post.

¹⁴ No-lose targets: no penalty applies if the threshold is not met.

Development - Trend	Potential Impact on Transport Sector	Remarks
		current geographical concentration
Differentiation	++	<ul style="list-style-type: none"> Transport sector can benefit from differentiation measures being discussed, especially allocated demand, positive list for certain types of projects and from applying multiplication factors for (certain types of transport) projects.
Environmental benefits	+++	<ul style="list-style-type: none"> If environmental (and other) co-benefits get greater recognition (and rewards) this can make CDM more attractive for the transport sector provided that other measurement related problems are also addressed
Baselines	++	<ul style="list-style-type: none"> The availability of approved standardized baselines for transport (sub) sectors could facilitate the entry of more transport project in CDM although for some transport activities it will be difficult to standardize baselines
Programs of Activities	++	<ul style="list-style-type: none"> Bundling of activities can be useful for the transport sector particularly if it will be possible to include different types of measures (e.g. Avoid – Shift and Improve). For example combining 10 BRTs under a PoA, or combining measures to strengthen public transport with measures to strengthen non-motorized transport.
Sectoral crediting	+++	<ul style="list-style-type: none"> If introduced, this new and not agreed upon approach could be of great significance to the transport sector.

- Negative, o Neutral, + light positive, ++ moderate positive, +++ large positive

Source: authors, partially based on Bongardt et al. (2009) and Bakker et al. (forthcoming)

4.2 NAMAs

49. Paragraph 1(b)(ii) of the Bali Action Plan calls for: “Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity building, in a measurable, reportable and verifiable manner.”

50. While the main role of developing countries in the Kyoto Protocol is as host countries in the CDM, the adoption of the NAMA concept would introduce a new form of developing countries participation in global climate governance. It is important to note that NAMAs are

however different from Annex I country targets as they will be proposed voluntarily by the developing country and are conditional to financing by developed countries.

51. The Ad-Hoc Working Group on Long Term Cooperative Action (AWG-LCA) was tasked at the COP 13 meeting in 2007 to develop proposals on amongst others the NAMA concept. The AWG-LCA will have its eight meeting in Copenhagen. The latest proposals on the NAMA concept are contained in the Report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention on its seventh session, held in Bangkok from 28 September to 9 October 2009, and Barcelona from 2 to 6 November 2009. (UNFCCC, 2009c)

4.2.1 Review of NAMA Concept

52. There is still a lack of clarity on the manner in which NAMAs will be designed, reviewed, implemented and monitored. Two annexes were composed by the CITS team to better understand the manner in which NAMAs could possibly function and be of relevance to the transport sector¹⁵.

53. The following gives an overview of key features of the NAMA concept¹⁶:

- The Bali Action Plan is explicit that NAMAs will be implemented in the context of sustainable development. Yet, little discussion has been conducted on how this can be best accomplished. The decentralized approach to safeguarding the sustainable development quality of CDM projects meant that sustainable development related co-benefits play no real role in the evaluation of the projects by the CDM Executive Board and it has made it difficult to measure sustainable development benefits in a comparable manner across projects.
- Definition of NAMA. The general understanding so far is that NAMAs are not restricted to actions which directly reduce GHG emissions but that they can also include actions which will facilitate or enable the reduction of GHG emissions. There is also no restriction to projects in the NAMA discussion so far and it is accepted so far that a NAMA can be a policy, a program or a project. While the various documents have a bias towards describing and discussing NAMAs at the national level there is no clear reason to assume that NAMAs could not be implemented at the provincial or city level.
- Three types of NAMAs are generally distinguished: (a) unilateral NAMAs, these are implemented on a voluntary basis and developing countries are expected to implement these without external support, (b) supported NAMAs, these are to be supported and enabled by technology, financing and capacity building, in a measurable, reportable and verifiable manner, and (c) credited NAMAs, in the case of these NAMAs emissions reductions can become part of an off-setting mechanism like CDM. The discussion so far focused mostly on supported NAMAs.
- It has been proposed that NAMAs would be registered in a NAMA registry. The registration process would include the amount of emission reductions accomplished through the NAMA. For supported NAMAs the NAMA registry

¹⁵ Annex 1: Supported NAMA Flow Chart and Annex 2: NAMAs and the Transport Sector in Developing Countries.

¹⁶ Mainly based on UNFCCC, (2007); UNFCCC, (2009c); and Aree Kim et al., (2009)

would also record the external support provided to support the implementation of the NAMA.

- A point of considerable debate is the linkage of NAMAs to Low Carbon Development Strategies or Action Plans, as advocated amongst others by the European Union and Japan, and the role that such strategies and/or action plans would play in determining the level of external support to the NAMAs. Developing countries through the Group of 77 and China have argued that such a linkage would infringe on the sovereignty of developing countries and be a step towards compulsory emission reduction goals.
- One of the main stumbling blocks for transport under CDM has been the measurement of baseline and impact of intervention on GHG emissions. So far little is known about the Monitoring, Reporting and Verification (MRV) requirements for NAMAs. The bar for supported and unilateral NAMAs might be placed lower than in the case of CDM because under supported NAMAs there would be no emission reductions generated which need to be validated¹⁷.
- Large emphasis has been placed, especially by the developing countries, on the need that NAMA related funding is predictable, measurable, reportable and verifiable. Also, mitigation funding should be clearly separated from development assistance. Less has been said about how the funding could be delivered. In the case of CDM emission reductions need to be certified before annual payments are made. Considering the emerging consensus on the definition of NAMAs which appears to indicate that funding would be available, under supported NAMAs, for both emission reduction and enabling activities a different disbursement mechanism will have to be found than in the case of CDM.

4.2.2 Relevance to the Transport Sector

54. The manner in which the NAMA discussion is unfolding: emphasis on policy, co-benefits, support to enabling activities, and less stringent “MRV” than in the case of CDM holds promise for the transport sector. And although many of the details still need to be settled the NAMA instrument might have the potential, more so than CDM, to help put the transport sector on a more sustainable growth trajectory.

55. Annex 2 assesses the (potential) relevance of the discussion on NAMAs for the transport sector. Key points are:

- Non-climate benefits from interventions in the transport sector are often much larger than climate benefits (if both are monetized). This would make it important that guidelines for (transport related) NAMAs explicitly include non-climate related benefits in financing, MRV and institutional arrangements. This should however not lead to unassailable methodological requirements.
- Supported NAMAs are expected not to include only direct GHG emission reduction activities (which often favor a technological approach) but also enabling capacity and institution building, removal of regulatory barriers activities. This is of particular relevance

¹⁷ In the case of credited NAMAs MRV mechanisms will most likely have to follow requirement similar to those of CDM.

to the transport sector (CCAP, 2009) where large scale emission reductions will require a combination of measures aimed at changing transport systems (i.e. reducing the need for travel through better land use planning, restraining the use of private vehicles, promoting public transport and non-motorized transport) with measures aimed at improving the fuel efficiency of individualized motorized transport.

- “Unilateral NAMAs are an important piece of a climate policy package for transportation, representing developing countries’ own contributions to mitigation efforts. There are numerous revenue-generating and low-cost mitigation options in the transportation sector, including fuel taxation reform, fuel economy standards, and smart growth land-use planning”. (CCAP, 2009)
- Sequencing of interventions in the transport sector is important. Technologically oriented activities will often generate benefits in a shorter time than measures aimed at modal shift or at changing land use patterns. The latter can take well over 10 years. The different time perspective of transport interventions will have to be taken in account in designing detailed NAMA guidelines. Also, capacity building and policy formulation often needs to precede actual investments in the transport sector for the latter to be effective.
- Because of the close linkages between climate change and other sustainability issues (pollution, congestion) and more general development issues such as energy security and urban development it is hard to determine the “Additionality” of a specific transport intervention or measure. While the measure might be additional from a climate policy perspective it might not be from more general environmental/developmental perspective or transport policy perspective.
- Additionality is a concept derived from CDM and was introduced to ensure the quality of off-sets realized. Since in the case of supported NAMAs no off-setting takes place this criterion may be less important. There will be still a need to create trust that funds are used for climate purposes, and to measure the global progress to the ultimate objective of reducing GHG emissions. Emission estimates are surrounded by large uncertainties both for current levels and especially so for projected BAU emissions in the transport sector. There is need for consensus building around assumptions used by different groups in modeling of the expansion of transport sector and to increase the availability of reliable activity data.
- MRV of GHG impacts could be a mixture from actual measurements of GHG emission reductions and indirect or proxy indicators and in some cases process indicators. Direct GHG impact indicators represent the “gold standard” in terms of indicators. Where such direct indicators are not available use can be made of proxy indicators (for example kilometers of bicycle lane constructed), or even of process indicators (number of people trained).
- Considering the importance of co-benefits in the transport sector, which in many cases provide the leverage to adopt and implement certain policies; programs and projects in the transport sector it important that adequate upfront support is available for the development of NAMA MRV methodologies which can quantify these co-benefits.
- Existing IPCC guidelines (IPCC, 2006) are mostly useful for general calculations of sector wide emissions in the transport sector but are less suited to assess sub-national

interventions where the use of fuel cannot be well determined, or allocated to specific modes¹⁸.

- Many of the transport interventions have no, or limited incremental costs (against benefits) particularly if all co-benefits are fully monetized. However, depending on what is defined as NAMA, capacity building and other non-investment elements (e.g. development of strategies, regulatory changes) could be supported based on the full cost.
- Taking into account existing funding practices it is expected that funding for development of the land transport sector in developing countries will continue to come primarily from resources in the developing countries themselves. Unlike the energy and building sector the largest share will come from public sector and not the private sector. The second largest source of funding is and will be development assistance. New UNFCCC mitigation and technology funds as well as GEF and other dedicated climate funds will only provide small share of transport funding¹⁹. Their use can be optimized if they are available upfront to facilitate and catalyze the development and implementation of sustainable, low carbon transport.

5. Case Studies on Applicability of Post 2012 Climate Instruments for the Transport Sector

5.1 Introduction

56. The case studies were introduced into the CITS project to help ensure that the recommendations to be formulated at the end of the project would reflect the reality on the ground in the developing countries. Case studies are being conducted in Brazil, Indonesia, Mexico and the Peoples Republic of China (PRC).

¹⁸ IPCC guidelines are for current emission (expost analysis) and not for estimation of future emissions (ex ante) or emission reductions.

¹⁹ Based on informal assessment of funding by Multilateral Development Banks which indicates range of \$ 15-20 billion for transport lending. Transport related funding by MDBs is expected to go up in the coming years because of increase in capitalization of several of the MDBs (See also 3.2). The European Commission proposed € 10-20 billion per year by 2020. Assuming that transport would get 20-25% (equivalent to share of emissions for transport sector) this would be € 2-4 billion per year which is well below the current and expected transport lending by MDBs..

57. The case studies are implemented by four different organizations, who are all working together with local organization(s) in the case study countries. This is expected to build capacity that can be used once the formulation of detailed guidelines for the post 2012 climate instruments will start.

58. For the ADB and the IDB the discussion on, and involvement in case studies, has been of great value in providing focus to their respective efforts to strengthen lending and non-lending assistance to sustainable, low carbon transport.

5.2 Hefei, Programmatic Public Transport CDM

5.2.1 Context description

59. Hefei is the capital of Anhui Province located in the centre of Eastern PRC, 500 km west of Shanghai. Due to economic and population growth, the demand for transport is growing rapidly. As the number of individual cars increases by 200-300 per day, congestion is becoming a matter of concern for policy makers, especially in the old city centre. Hefei prioritizes the development of public transport in order to increase its modal share. Two north-south and two east-west subway lines are planned to establish an urban rail transit system of 120 km. BRT development is expected to reach 180 km with a density of 0.5 km/km² in 2020. Walking and cycling are still the most important transport modes. However, the share of the individual motorized transport is increasing.

5.2.2 Description of the proposed CDM program

60. The Hefei Planning Bureau intends to develop a low-carbon district north to the city centre. The idea is to create a “Walkable City” with mixed types of building and land-use patterns. Residents shall be encouraged to choose walking through direct, convenient, safe and accessible walking routes. Moreover, the city plans an area-wide, comprehensive public transport network with non-motorized transport-friendly urban nodes around public transportation stations (BRT and underground) in order to provide direct access to other parts of Hefei.

61. By building a “Walkable City”, it can be expected that activities and modal share would be influenced. The Walkable City concept would reduce the total transport activity: A district with mixed types of buildings and land-use would lead to smaller distances travelled. It would also influence the modal split, due to its characteristic of a Walkable city and its good access to public transport, the residents would potentially use energy efficient transport modes instead of individual motorized transport.

62. The City of Hefei has commissioned an urban planning consultancy to further develop this concept of a “Walkable City”. This concept could be used as a blueprint for a Programme of Activities (PoA).

5.2.3 Methodological issues in assessing/ quantifying the CO₂ and other co-benefits

63. This CDM project idea aims at modelling traffic generation, traffic distribution and the choice of transport modes through a travel demand model, as real data is not available. The modelling approach will be conducted in close co-operation with the urban planning consultancy that has been commissioned to design the “Walkable City”. A CDM project must also calculate the number of trips, trip lengths and the modal share for the baseline scenario, i.e. the mobility behaviour of the residents if they did not live in the “Walkable City”. This appears to be

extremely challenging, as the project emissions have to be compared to a hypothetical situation that cannot be observed in reality. To overcome the existing concerns about climate integrity, this CDM project proposal “Walkable City” in Hefei aims at using multi-project baselines. They are currently discussed under the AWG-KP and would essentially be sectoral benchmarks for specific project activities.

64. The project activity “Walkable City” in Hefei City will use the: (a) average number of trips per day and inhabitant; (b) average distances covered; and (c) average modal shares of the respective 20% Hefei residents that have the most climate-friendly mobility behaviour in regard to these three factors²⁰.

5.2.4 Expected CO₂ benefits and associated co-benefits

65. Due to the concept of mixed land-use and good access to energy-efficient transport modes, CO₂ reductions are expected. Other environmental co-benefits include reduction of land-use, noise and local pollutants. These effects will be quantified to the extent possible. It must be assumed that the 20% Hefei residents with the most climate-friendly mobility behavior induce less CO₂ emissions than an average inhabitant of the “Walkable City”. Therefore, the final report will include a discussion, under which circumstances benchmarks for mobility behavior could be introduced.

5.2.5 Financing approach

66. The Hefei government decides about the budget to be spent for construction and operation of the urban transport systems. Since 2006, the City of Hefei was able to provide 2 billion RMB of own resources for the construction of urban infrastructure and 60 million RMB for operation of transport. Additional funding resources are bank loans from the China Development Bank and other banks, corporate bonds and the AD. Since 2006, approximately 10 billion RMB have been spent for urban infrastructure development, 80% of which for urban transport infrastructure construction. Hefei, like many other cities in PRC, has a high budget deficit. Therefore additional income resources are necessary to develop sustainable, low-carbon transport systems.

67. The revenues from the possible CERs generated will need to be higher than the CDM transaction costs, including the survey costs for monitoring emission reductions. Finally, the estimated net profit would have to be compared with the money to be spent to build the transport infrastructure.

5.2.6 Institutional approach for the planning, review, implementation, monitoring and reporting of the NAMA

68. Project proponent would be the City of Hefei, being the responsible institution for infrastructure investments. In case the “Walkable City” in Hefei was to be part of a PoA, any private or public entity, e.g. an institution under the National Development and Reform Commission (NDRC) would be coordinating the PoA, whereas Hefei’s new sustainable district would be a CPA.

²⁰ This is in line with paragraph 48 (c) of the CDM’s modalities and procedures (contained in the Marrakesh Accords). It states that the performance of the top 20% of similar project activities conducted in the last five years could be used as basis.

5.2.7 Further work to be done under the case study

69. The most important work to be done is the collection of data to calculate project and baseline emissions of the CDM project concept “Walkable City” in Hefei, PRC. This will eventually lead to a hypothetical calculation of emission reductions.

5.3 Jakarta, Transport Demand Management (TDM) NAMA

5.3.1 Context description

70. Indonesia faces a particular challenge in taking mitigation actions in the transport sector. Land transport in Indonesia represents 47.5% of primary energy consumption and transport emissions are expected to increase roughly two-fold over the next 10 years (Republik of Indonesia, 2009). Recent rapid growth of car ownership, has contributed to a number of issues associated with transport in Jakarta: congestion, rapid growth in carbon emissions, and increased air pollution. Noise and road safety are negatively affected by the traffic growth.

5.3.2 Description of the proposed NAMA

71. Transport Demand Management (TDM) is based on ‘a strategy which aims to maximise the efficiency of the urban transport system by discouraging unnecessary private vehicle use and promoting more effective, healthy and environmental-friendly modes of transport’ (Broaddus et.al., 2009).

72. Current TDM measures, including: (a) The development of a network of Bus Rapid Transit (BRT), and (b) Limiting access to a part of the central business district to cars containing more than 3 people have not been sufficient to counteract the effects of rapid growth in motorisation. In this context, a number of additional TDM measures are gaining acceptance by local policy makers as options for implementation in the near future: (a) electronic road pricing, (b) parking restraint, and (c) further improvements in public transport (particularly BRT).

5.3.3 Methodological issues in assessing/ quantifying the CO₂ and other co-benefits

73. The University of Bandung has applied a transport model to assess the impact of TDM measures in the city of Jakarta. The approach utilises an “equilibrium flow” model which assesses the demand for travel by collating origin and destination information, and then distributing these journeys across the existing network. Whilst the model is best suited to traffic management and assessing congestion, it can also be used for estimating vehicle kilometres and emissions of both carbon and air quality pollutants. The output of the model is provided by road link, giving a very high spatial resolution. It is suitable for both “business as usual” projections as well as determining the outcome from the implementation of a range of different mitigation measures, both individually, and combined into suites of measures (i.e. scenarios).

74. The existing transport model already provides a well established list of indicators to track progress on key issues of concern, including;

- Vehicle movement (which can be translated into carbon emissions by examining the assumptions on the vehicle stock and emission factors)
- Congestion levels
- Air Quality Pollutant Emissions

75. However, the main barrier towards the tracking of progress lies in the lack of adequate data, in terms of volume and quality.

5.3.4 Expected CO₂ benefits and associated co-benefits

76. Scenario work using the TDM model has demonstrated that total transport demand can be reduced by approximately 4-5%²¹, and expected CO₂ reductions could be calculated using specific data provided by the modelling, including km-travelled coupled with vehicle emission factors –resulting in reductions roughly in the same magnitude.

5.3.5 Financing approach for the NAMA

77. Because TDM heavily relies on domestic intervention at policy level (e.g. setting up and enforcing regulations, planning entire networks etc), it is generally thought that TDM may be appropriate as a unilateral NAMA. However, the limited institutional, financial and technical resources to implement TDM measures in Jakarta leads to the conclusion that at the moment, Jakarta may benefit from further (international) support to step up the implementation of TDM as an internationally supported (non-tradable) NAMA.

78. There are many ways in which TDM can be supported by the international community, in terms of capacity building, technology transfer and financing. Possible financing should distinguish between financing for items;

- To allow TDM to **qualify** as a non-tradable NAMA (pre-implementation)
- To allow the actual **implementation** of the TDM measures. This is further divided into the three elements contained within the proposed TDM package (parking restraint, better public transport and electronic road pricing)

79. Potential sources of funding would be, in addition to domestic funding, UNFCCC mitigation fund and technology fund as well as loans and grants.

80. Crediting under a sectoral target (with boundaries set at a city level) may potentially be conceived for this NAMA.

5.3.6 Institutional approach for the planning, review, implementation, monitoring and reporting of the NAMA

81. There are a large number of institutions at the national and local level who would be involved in the implementation of the NAMA. Coordination is an issue which needs significant attention. A key question is who will be the overall “owner” of the NAMA consisting of three different types of measures. The implementation of the NAMA is expected to be centered around local institutions while planning and review may have both local and national level involvement. The monitoring and reporting is expected to be carried out by the national level, but with strong cooperation with the local level.

5.3.7 Further work to be done under the case study

82. Amongst others following needs to be done:

- a) Further development of the transport model: better air quality pollutants modelling; fleet characterization; and more detailed emission factors

²¹ Note that this figure depends heavily on the assumptions. This figure is provided for indicative purposes only, and is subject to change.

- b) Detailed financing structure; budget and possible contributions from mitigation fund, technology fund, domestic resources and development assistance
- c) Resolving institutional coordination responsibilities and mechanisms

5.4 D. Belo Horizonte, NAMA

5.4.1 Context description

83. Belo Horizonte (Beautiful Horizon) is the capital of the state of Minas Gerais and is located in the southeastern region of Brazil. It is the third-largest metropolitan area in the country. Belo Horizonte has a population of over 2.4 million, reaching almost 5.4 million in the official Metropolitan Area.²² Belo Horizonte is currently developing a Comprehensive Mobility Plan –planmobBH (Logit et al., 2009), under the new requirements by the Ministry of Cities.

84. The Plan involves extensive data collection and modeling efforts which are suitable for baseline and projection analysis, and helpful in defining a monitoring, reporting and verification –MRV- proposal. The indicators defined so far to compare alternative scenarios are limited to modal distribution, travel speeds and congestion levels. There is an opportunity for improving planmobBH by incorporating environmental dimensions, especially the quantification of Green House Gas and local emissions.

5.4.2 Description of the proposed NAMA

85. The NAMA for integral urban mobility seeks the reduction of GHG emissions from the urban transport and the improvement of transport conditions, the local environment and the population health through an integrated urban mobility plan. The NAMA seeks to avoid the increase of vehicle miles, shift passenger and cargo movements to efficient modes, and improve the energy efficiency of the vehicle fleet. Actions under the plan are also expected to increase the city competitiveness and the quality of life.

86. The integrated urban mobility plan includes enhancement of public transport (BRT and Metro), metropolitan fare integration, construction of infrastructure and promotion of active transport (pedestrian and bicycles), and combined land use and parking policies. The plan is presented in different scenarios, which depend on the availability of funding and implementation capacity of the responsible agencies.

5.4.3 Methodological issues in assessing/ quantifying the CO₂ and other co-benefits

87. Green House Gas reductions are expected from the reduction of the length of personal trips due to densification (avoid), reduction of the total vehicle kilometers as the participation of public transport increases (shift), and enhanced efficiency of the vehicle fleet (improve).

88. GHG and co-benefit calculations can be performed routinely by the transport planning organizations as part of a continuous, comprehensive planning process. The calculations require periodic updates (e.g. every year) of the transport model inputs (supply: transportation networks; demand: O-D matrix by mode), and estimation of the following indicators: (a) Trip length by mode (km), (b) Total system travel time by mode (hours)

²² http://en.wikipedia.org/wiki/Belo_Horizonte

5.4.4 Expected CO2 benefits and associated co-benefits

89. Based on preliminary assessment it is estimated that 926,222 CO₂eq tonnes/year will be emitted less because of the implementation of the NAMA. Main transport co-benefits of the plan are reductions in travel times (due to increased travel speeds) and travel costs (due to increased efficiency of public transport). In addition there are expected reductions in local pollutants, accidents, increased physical activity, which result in reductions in mortality and morbidity. Increased accessibility also results in increased land values, reduced costs for the distribution of goods, increased access to job opportunities. With the majority of low income population living in the periphery, the plan also results in increased equity. It is possible to quantify these impacts using the results of modeling.

5.4.5 Financing approach for the NAMA

90. A model NAMA for urban transport is expected to help in removing barriers for implementation, namely funding, public acceptance and continuity over time. Funding for transport infrastructure is expected to come from public funds, while equipment (buses and fare collection and control systems) is mainly expected to come from private funds, through project finance based on user fares. As the requirements for funding infrastructure are expected to be sizeable, a combination of local, state and federal funds is expected.

91. Making explicit the GHG reduction potential, and establishing quantitative goals and an MRV mechanism, will eventually increase the likelihood of receiving funding as the local plan helps achieving national goals in limiting GHG. It also provides a unique opportunity for the city to participate in international funding flows: supported NAMA outside the offsetting mechanisms and multilateral or bilateral grants and loans with climate change objectives.

5.4.6 Institutional approach for the planning, review, implementation, monitoring and reporting of the NAMA

92. Plan implementation and oversight requires the coordinated effort of several agencies in the city administration (Prefeitura de Belo Horizonte), under the leadership of the transport agency (BHTrans) and the participation of the environment agency. Reporting could be assigned to a joint committee of transport and environment agencies, which will generate a full report periodically (e.g. every year). Funding for data collection, modeling activity and analysis should be assigned accordingly. As the transport modeling efforts are helpful for continuous improvement of the transport network, the reporting requirements do not constitute an extraordinary burden on the local institutions. Adequate technical capacity is available locally to conduct the required studies and complete the reports.

5.4.7 Further work to be done under the case study

93. Further work under the case study will focus on:

- Which are the GHG mitigation and co-benefit potentials of sustainable, low carbon transport in a mid size Brazilian?
- What would an Avoid-Shift-Improve oriented NAMA for Brazilian city/cities look like?
- How would it be organized?
- How would it be financed?
- How would it be Monitored-Reported-Verified?
- How could it be scaled up?

5.5 Mexico, Optimization of conventional bus system NAMA

5.5.1 Context description

94. Helped by low fuel prices, bad quality of public transportation, and the availability of inexpensive vehicles on the market, transport is the largest and fastest-growing sector in Mexico with regard to energy consumption and GHG emissions. The overall transport sector is responsible for around 18 % of total GHG emissions in the country, with road-transport making-up the majority (90%) of emissions from the sector (World Bank 2009).

95. Mexico has published a national climate plan, called 'Programa Especial de Cambio Climático 2009-2012' (PECC) (SEMARNAT (2009), in which it specifies objectives and goals (actions) to achieve in the different sectors. In the PECC, 8 transport-related objectives (and 12 goals) are specified which are estimated to achieve emission reductions of 11.35 Mt CO₂-eq from 2008-2012 Mt CO₂-eq.

A big network of privately owned minibuses (peseros) operates in the valley of Mexico. A fleet of more than 28.000 peseros (as of 2007) transports an important part of Mexico City's public transport passengers, surpassing by far the capacity of the metro or the other public transport modes. Due to poor regulation and lack of system planning, a system of single-owner operated buses has developed. This has resulted in the so-called "War for the Peso" with drivers competing against each other. This system contributes to pollution, traffic congestion, high accident rates as well as poor service quality.

5.5.2 Description of the proposed NAMA

96. The proposed NAMA builds on PECC Objective 2.2.6: "Build a modern, urban public transport management system which responds to sustainability criteria and implies a high (positive) social impact, in cities with more than 100 thousand inhabitants". PECC further details this objective as: " Increase from 36 % in 2006 to 100% in 2012, within the programs of PROTRAM and FONADIN²³, the percentage of metropolitan areas and cities with more than 100 thousand inhabitants with public transport modernization projects, with an emphasis on the development of bus rapid transit systems and lanes".

97. While the expansion of BRT systems is already planned and financed through other sources (e.g. Clean Technology Fund), the NAMA focuses on the optimization of the conventional bus system itself will focus on in the valley of Mexico. Components of the NAMA comprise (a) the establishment of the institutional and regulatory framework needed for the optimization of the bus system, including the creation of a regulatory entity as well as an operation and management entity: (a) Establish the institutional and regulatory framework needed for an effective optimization of the bus system; (b) data gathering and modeling (d) the implementation of changes in the bus system, e.g. reorganization of routes, concession management (bus size/technology) Implement changes in bus system (optimization), and (e) Public Awareness raising and outreach.

²³ The National Infrastructure Fund (FONADIN) is the main tool for financing infrastructural investments in Mexico (e.g. highways, railways etc.) and includes a program to support the development of massive transport systems in Mexico called PROTRAM.

5.5.3 Methodological issues in assessing/ quantifying the CO₂ and other co-benefits

98. Emission reductions of the NAMA are deriving from efficiency gains achieved through the optimization of the conventional bus routes. Due to this optimization, current overcapacity is decreased. Direct emission reductions are due to: (a) Decrease in number of buses, (b) Optimized bus size, and (c) Decrease in route length. Indirect emission reductions are achieved because a more efficient transportation system leads to an increase in the number of people using public transport. Optimizing the bus system can therefore contribute to limiting the growth of the number of private vehicles. Estimation of such indirect effects will however be difficult and subject to considerable uncertainties.

99. It would be necessary to monitor a number of different indicators which together would be able to give a picture of the increase in efficiency of the bus system. Possible indicators for tracking progress could be: (a) Number of bus units, (b) Fuel use per passenger (and km), (c) Route length, (d) Average efficiency of bus units (of same size), and (e) Passenger trips per year.

100. An existing model to calculate the respective indicators is outdated and thus not quickly available for baseline setting and planning. In order to up-date and maintain it for planning purposes, a lot of data gathering and modeling are necessary which will require significant financial resources to be invested.

5.5.4 Expected CO₂ benefits and associated co-benefits

101. Bus system optimization is the intervention with the highest emission reduction potential for Mexico of all 9 interventions analyzed in the 2009 World Bank MEDEC study (maximum annual emission reduction of 31.5 MtCO₂-eq for Mexico as a whole).

102. The bus system optimization brings various co-benefits which are: (a) Less congestion, (b) Time savings, (c) Increased public transport quality, (d) Positive health effects due to lower air pollution, (e) Cost savings for operators/passengers, and (f) Decrease in accidents. According to the 2009 World Bank MEDEC study, bus system optimization is also the intervention with the highest net benefits (Johnson et al. 2009). In the MEDEC study, direct benefits, unpaid time benefits and externalities (e.g. health effects) are calculated and together amount to 96.6 \$/t CO₂-eq for the optimization of the bus system.

5.5.5 Financing approach for the NAMA

103. The NAMA can be implemented at negative costs. As with all no-regret measures, certain barriers inhibit the possible cost-savings from being realized. In the case of the bus system optimization, these are for example, lack of information and data on possible benefits, high up-front cost which can only be recovered over longer time horizons (financial barriers), as well as social dimensions (e.g. employment effects). For interventions with negative costs, an incremental cost analysis is not appropriate. Instead, the barrier removal costs could be calculated.

104. Financing granted to NAMAs can be adapted for each action within the NAMA depending on its characteristics. It could be argued that actions which are not directly leading to future revenue streams (e.g. capacity building, institutional and regulatory changes, development of models, studies or strategies) should be financed in the form of grants based on full cost, as they would otherwise increase the national debt. Financing might be in the form of soft loans where up-front financing is enabling the generation of revenues and thus costs can be

recovered by the respective entity due to increased revenue streams in the future (e.g. costs for implementing route optimization which is decreasing the cost of operation of the overall system). External financing will complement domestic financing.

5.5.6 Institutional approach for the planning, review, implementation, monitoring and reporting of the NAMA

105. The Ministry of Transport of the Federal District of Mexico (SETRAVI) would probably be the leading institution for planning and implementation of the NAMA. Further government entities to be involved would be the Ministry of Transport of the State of Mexico, and the Ministry of Environment of the Federal District of Mexico). The NAMA comprises the establishment of a new regulatory entity which would then take over some of the functions specified in the NAMA.

5.5.7 Further work to be done under the case study

106. Work to be done within this project will include

- A further specification of the NAMA with regard to components and activities
- Development of the MRV methodology in line with available data and modelling capacity
- Outline of institutional structures necessary to implement the NAMA
- Elaboration of financing structure for NAMA
- Elaborate on important policy conclusions with regard to the climate negotiations

5.6 Initial Case study findings

107. The initial results from the case studies indicate:

- In all the four cases there is a policy context which shows an awareness of the need to improve sustainability and a willingness to consider a range of measures which would structurally alter the transport system in the concerned city;
- Once completed the four case studies will offer important information on the challenges and opportunities of the implementation of an integrated transport strategy aimed at securing local and global environmental benefits;
- There are differences in capacity to plan, implement, monitor and report on an integrated transport strategy aimed at securing local and global environmental benefits in the four case study locations;
- The case studies have made varying progress in the development of methodologies to determine local and global benefits. A dilemma faced by all the case study teams is whether to base the methodology on available data or whether to base methodology on an assumed level of required detail and reliability in determining especially the global GHG impacts. In all cases the availability for funding for data collection would greatly enhance planning and most likely increase buy-in from local stakeholders for the proposed intervention.
- All four case studies face varying degrees of difficulties in ensuring data availability to determine both local and global benefits of the proposed

measures. In some cases the required data systems are not in place, In other cases there are budgetary constraints in the regular updating of data;

- All case studies are developing a financing plan whereby possible carbon financing through either programmatic CDM or supported NAMAs is a (minor) component of overall financing. In the case of supported NAMAs there is currently still a lack of ideas how structure the financing; would there be annual payments, will NAMA financing be contingent to a positive ex-post evaluation?

6. Initial Conclusions and Recommendations and Next Steps

6.1 Initial Conclusions and Recommendations

Key Conclusions:

- NAMAs may provide better opportunities for the transport sector than current mechanisms
- Existing modeling studies and marginal abatement cost curves often do not capture the full costs and benefits of transport interventions, notable those related to 'avoid' and 'shift'.
- Support for NAMAs in the transport sector may need to focus on 'barrier removal cost' rather than incremental cost which is done conventionally. Capacity building and policy support may be important components.
- Including co-benefits for local air quality, reduced congestion and energy security in the appraisal of climate related transport interventions often reduces the GHG abatement cost significantly, however quantification remains challenging.
- NAMA financing and other international sources of funding may be targeted at similar (elements of) interventions in the transport sector, and therefore their relation needs further exploration.
- MRV of transport measures is likely to be challenging, and there is a need for better activity level data and development of methodologies. A certain degree of uncertainty however may need to be accepted, as baselines are hard to establish.

108. Transport provides access to jobs and markets, schools and healthcare and is an integral part of the development process. A large part of the population of the developing countries still lives in poverty and an expansion of transport activities to drive economic and social development is called for.

109. The challenge for this sector will be to provide economically affordable, attractive transport options which can help slow down the trend of moving towards transport systems based on environmentally unsustainable motorized private vehicles.

110. The transport sector is the fastest growing sector in terms of GHG emissions, both in developed and in developing countries. Globally the transport sector is notorious for the difficulty to realize GHG emission reductions till now. This makes it tempting to concentrate on sectors where it is easier to realize emission reductions, such as the energy sector. If the world community is to be successful in realizing ambitious medium and long term emissions reduction

targets and objectives in support of a maximum 2 degree Celsius temperature rise by 2050 all sectors, including the transport sector, will have to take action.

111. The period 2012 -2018 will be a decisive time for mitigating emissions from the transport sector in developing countries. If no effective measures will be taken in that period to influence emissions from the transport sector a point of no-return might be reached from which it will be difficult to retreat. Businesses as usual scenarios indicate a growth of over 100% in vehicles for the period 2012 – 2018. Such an unchecked growth of vehicles is likely to be associated with corresponding increases in transport infrastructure (roads, fly-overs etc.) which almost certainly will lock-in further increases in the number of vehicles. The key to long term success in reducing emissions in transport sector is action now.

112. An uncontrolled increase in CO₂ emissions from the transport sector in developing countries would most likely be accompanied by more congestion, air pollution and a further decrease in road safety.

113. The period 2012-2018 does however also offer an opportunity for the transport sector to become more engaged in climate change mitigation. The new climate agreement which is being discussed now will result in more ambitious mitigation targets. Moreover, new instruments and associated funding mechanisms will almost certainly put in place to help developing countries to adopt a less carbon intensive development strategies.

114. In order to achieve an economy wide transformation it is important that post 2012 climate instruments will be applicable to the transport sector. “Applicable” in this context means that such instruments will be able to help catalyze a transformation of the transport sector in developing countries to a growth path which will result in a substantial deviation in GHG emissions from business as usual. To be able to contribute in a meaningful manner means that the instruments need to set the right direction and are deployed at a scale that is sufficient to give rise to the transformational changes needed.

115. As demonstrated in this report there is a considerable CO₂ emission abatement potential from the transport sector in developing countries especially if non vehicle technology related options are considered as well. The Avoid - Shift – Improve approach represents an integrated approach which, if implemented in a comprehensive manner, can help in achieving a structural transformation of the transport sector. A technology focused approach alone will not result in large enough emission reductions because of the rapid growth of the vehicle fleet in developing countries which will negate emission reductions achieved through efficiency improvements.

116. Transport has not fared well under the existing climate instruments, especially CDM. This is related to both the transport sector and the character and detailed guidelines of CDM under the first commitment period of the Kyoto Protocol. It is therefore encouraging that the current discussions on post 2012 climate instruments (post-2012 CDM and NAMAs) do provide more perspective for the transport sector and has the potential to address several of the barriers which prevented a wide-ranging engagement of the transport sector until now.

117. The proposals discussed with respect to the future of CDM: to make use of positive/negative lists, allocation of CER demand to specific project types or host countries, the possible use of discounting in case of uncertainty on reliability of baseline, the use of standardized baselines all offer possibilities for the transport sector to engage in a wider scale. The adoption of credited transport NAMAs would be another impetus for the transport sector to be more part of off-setting mechanisms.

118. NAMAs intend to stimulate domestic mitigation activities in developing countries. By allowing funding for enabling activities through “supported” NAMAs that contribute to removing barriers to the implementation of “Avoid-Shift-Improve” related approaches in the transport sector, it appears that they would offer perhaps even better possibilities for the transport sector than in the case of revised CDM. If the MRV procedures agreed upon will be less restrictive than in the case of CDM and if adequate funding is available for NAMAs, it might be that especially “supported” NAMAs can contribute in a significant manner to the funding of implementation measures under the “Avoid-Shift-Improve” approach.

119. Transport NAMAs and transport CDM will be in the best case scenario provide only a minor part of overall funding for both enabling and implementation activities, compared to other sources of funding. It is important therefore to focus right from the beginning how future funding from NAMAs and CDM will relate to the other funding streams in the transport sector. The challenge is not to replace existing funding from development assistance but rather in tandem with development assistance funding facilitate, catalyze and lever a re-orientation in the funding of transport in developing countries towards a more sustainable, low carbon future.

120. The relevance of CDM and NAMAs as a meaningful instrument for the transport sector will be greatly influenced by the manner in which these instruments will incorporate non climate related benefits in their conceptualization. Experience has shown that the non-climate benefits from transport measures are often much larger than the climate impacts (especially so in the case of non technology related measures). The incorporation of these benefits in the total costs of measures fundamentally changes the “incremental costs” of these measures. There is a need for further discussion how to integrate the co-benefits approach in post 2012 climate instruments without creating another barrier for funding because of growing complexity in MRV procedures.

121. Reflecting the importance of the transport sector as a source of emissions it can be argued that it is important to reserve a % of NAMA funds for the transport sector, combined with a possible geographical allocation. The role of NAMAs is to catalyze and enhance mitigation action. This can be best achieved by stimulating a paradigm shift that will result in a structural transformation of the transport sector. Paradigm shifts happen less easily if funding is allocated to a limited number of countries (even if those countries are responsible for a majority of the emissions).

122. Policy-based “supported” NAMAs, and to a lesser extent also PoAs and sectoral crediting, have many similarities with programmatic approaches applied in development assistance by Multilateral Development Banks. International decisions on NAMA financing and the revision of CDM with regard to institutions, modalities and procedures should therefore evaluate such already existing experiences in the detailed design of NAMA and revised CDM guidelines and procedures.

123. The availability of “fast starting finance” for the period 2010-2012, as proposed amongst others by the EU is especially relevant to the transport sector in developing countries, which in many cases has not received the same attention as for example the energy sector in developing low carbon transformation strategies and can be used to: (a) improve transport data and baselines, (b) develop institutional coordination and capacity to implement “Avoid-Shift-Improve” interventions, (c) develop integrated co-benefit assessment methodologies, (d) develop financing models for various types of transport NAMAs, and (e) pilot transport NAMAs.

124. Ultimately what is needed are instruments that can demonstrate a direct or indirect impact on CO₂ and GHG reduction, which acknowledge co-benefits, which are relatively simple, and which can be applied in a transparent and predictable manner.

6.2 Next Steps

125. The current phase of the CITS project is expected to be concluded in May 2010²⁴. In the remaining period efforts under the CITS project will focus on:

- Developing a better understanding of, and consensus on, the GHG mitigation potential in the transport sector in developing countries. The impact of such understanding and consensus goes well beyond the direct focus of the CITS project: the post 2012 climate instruments and can directly influence transport and climate change policies in developing countries. This will entail a closer look at transport policies and programs in developing countries as well as the literature on transport and climate change.
- Provide more transport related examples to support the discussion on re-orienting CDM to make it more effective.
- Expand the analysis of NAMAs to “Unilateral” NAMAs, which are implemented on a voluntary basis by developing countries and which do not receive external support.
- Completing the case studies in Brazil, Indonesia, Mexico and Peoples Republic of China. The case study results will help in raising awareness in these countries on the possibilities to make use of climate instruments as defined in a future climate agreement, as well as aid in the thinking of MRV of transport measures. This can help to catalyze and facilitate climate action in the transport sector.
- Studying the linkage between climate funding, other sources of external funding (e.g. development assistance or Foreign Direct Investment) and domestic funding (public and private sector). The expansion of the transport sector in developing countries will require large amounts of funds. While there is considerable scope for expansion of climate related funding through e.g. CDM and NAMAs it is to be expected that such funds will be modest in comparison to other categories of funding listed here.
- Improving transport data to facilitate monitoring, reporting and verification process. A specific problem for the transport sector under CDM has been the availability of data to draw up base lines and to measure impacts. Contributing to this problem has been the overall poor availability and quality of transport data in developing countries as well as the absence of appropriate methodologies to determine CO₂ emission reductions associated with specific interventions (both ex-post and ex-ante). A general improvement in transport data would be very helpful, especially now that revised CDM and also NAMAs are moving increasingly towards sector or sub-sector wide approaches. It is recommended to anticipate the adoption of standardized baselines under CDM and in dialogue between the climate and transport community discuss the development of various standard baseline methodologies. Such will also be useful for NAMAs as well as for GEF, and other organizations providing support to mitigation of climate change effects in the transport sector.

²⁴ The final results of the CITS Project will be presented at the second ADB Transport Forum, 24-28 May 2010 in Manila, Philippines

126. The CITS project is part of the work program of the Partnership on Sustainable, Low Carbon Transport (www.slocat.net). The SLoCaT Partnership activities improve the knowledge on sustainable low carbon transport, help develop better policies and catalyze their implementation. The SLoCaT membership which includes almost 50 organizations (UN and other international organizations, development banks, bilateral development organizations, NGOs, and academe) can be of great help in broadening the circle of organizations involved in the discussion on post 2012 climate instruments.

References

- ADB (2008). *Clean Energy Financing Partnership Facility - Semi Annual Progress Report, January – June 2008*. URL: <http://www.adb.org/Documents/reports/CEFPF/CEFPF-Semiannual-Progress-Report.pdf>
- ADB (2009a). *Rethinking Transport and Climate change*. Draft.
- ADB (2009b). *Transport Operations* URL: <http://www.adb.org/Transport/operations.asp>
- African Development Bank (1997) An evaluation of bank group policy-based lending operations, 1986-97. <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Evaluation-Reports/00157913-EN-EVALUATION-POLICY-BASED-LENDING.PDF>
- ADB (2007). Evaluation on Policy based lending: Emerging Practices in Supporting Reforms in Developing Member Countries. <http://www.adb.org/Documents/SES/reg/policy-based-lending/EVU-OTH-2007-18.asp>
- Aeree Kim, J., J. Corfee-Morlot and P. de T'Serclaes, "Linking Mitigation Actions in Developing Countries with Mitigation Support: a Conceptual Framework", IEA-OECD, 2009
- Atteridge, A., C. Kehler Siebert, R. J. T. Klein, C. Butler, and P. Tella (2009). *Bilateral Finance Institutions and Climate Change: A Mapping of Climate Portfolios*. Stockholm Environment Institute Working Paper 2009
- Bakker, S. H. van Asselt, C. Haug, R. Saïdi, J. Gupta (forthcoming). Future of CDM: same same but differentiated? Forthcoming in *Climate Policy* xx (2010) pp xx-xx..
- Bole, T., S. Bakker, M. Saïdi (2009). Balancing the carbon market. Carbon market impacts of developing country emission reduction targets. PBL/ECN report WAB 500102 030, available from www.pbl.nl
- Bongardt, D., W. Sterk, F. Rudolph (2009). Achieving Sustainable Mobility in Developing Countries: Suggestions for a Post-2012 Agreement. *GAIA* 18/4 (2009): 307–314; available at www.slocat.net
- Capoor, K., and P. Ambrosi (2009). *State and Trends of the Carbon Market 2009*. World Bank. Available from <http://wbcarbonfinance.org>
- CDM Rule Book. Available at <http://cdmrulebook.org/>
- Center for Clean Air Policy, (2009). *Transportation NAMAs: A Proposed Framework*.
- Center for European Policy Studies (2009). "Flexible Mechanisms in support of a new climate change regime- the Clean Development Mechanism and beyond", Taskforce Report, Brussels, 2009,
- Clapp, C., K. Karousakis, B. Buchner, and J. Chateau (2009). *National and sectoral GHG mitigation potential: a comparison across models*. IEA/OECD, Paris.
- Co-Benefits Approach to Climate Change Projects. Version 1.0. available from www.unfccc.int
- Dalkmann, H. and C. Brannigan (2007). *Module 5e. Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities*. GTZ.
- Duncan, T., (2009) *Financing Mechanisms for Sustainable Transport*. ADB Presentation at High Level Meeting on global Environment and Energy in the Transport Sector, Japan
- GEF (2008). *Transfer of environmentally sound technologies: the GEF Experience*.
- GEF (2009a). *Investing in Sustainable Urban Transport. The GEF Experience*
- European Commission (2009). *Climate change: Commission sets out global finance blueprint for ambitious action by developing nations*. Press release. Available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1297&format=HTML&aged=0&language=EN&guiLanguage=en>.

- Hoer, A., K. Geurs, H. de Wilde, C. Hanschke, M. Uytendinck (2009). CO₂ emission reduction in transport. Confronting medium-term and long term options for achieving climate targets in the Netherlands. PBL publication number 500076009.
- Huizenga, C., (2009a). Global Policy for Sustainable Low Carbon Transport in Developing Countries. Asilomar 2009 Conference on Transport and Climate Change. Available at http://www.its.ucdavis.edu/events/outreachevents/asilomar2009/presentations/Session%201/Huizenga_Asilomar_2009.pdf
- Huizenga, C., (2009b). REST description and outreach. Presented at IDB Transport week 2009, Sao Paulo, Brazil
- IEA (2009). *World Energy Outlook 2009*. ISBN: 978 92 64 06130 9, Paris.
- IEA/OECD (2009) Transport, Energy and CO₂. Moving toward sustainability. ISBN 978-92-64-07316-6, Paris.
- Instituto Nacional de Ecología, INE. The Benefits and Costs of a Bus Rapid Transit System in Mexico City, Final Report, May 2008.
- IPCC (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 3 Mobile Combustion. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_3_Ch3_Mobile_Combustion.pdf
- ITDP (2009, draft) GEF Transport Sector Project Analysis. October 14, 2009 Interim Working Draft
- Japan Ministry of Environment (2009). Manual for Quantitative Evaluation of the co-benefits of transport projects.
- Johansson, B. (2009) Will restrictions on CO₂ emissions require reduction in transport demand? *Energy Policy* 37(2009) 3212–322
- Johnson, T.M., C. Alatorre, Z. Romo, F. Liu (eds) "Low-Carbon Development for Mexico" Conference Edition, The World Bank, October 2009 : <http://go.worldbank.org/PQ1L06KFL0>
- Kahn Ribeiro, S., S. Kobayashi, M. Beuthe, J. Gasca, D. Greene, D. S. Lee, Y. Muromachi, P. J. Newton, S. Plotkin, D. Sperling, R. Wit, P. J. Zhou, 2007: *Transport and its infrastructure*. In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Olsen, K.H., and J. Fenhann (2008). Sustainable development benefits of clean development mechanism projects. A new methodology for sustainability assessment based on text analysis of the project design documents submitted for validation. *Energy Policy* 36, 2819-2830.
- Logit, BHTRANS, Prefeitura de Belo Horizonte "Plano de Mobilidade Urbana de Belo Horizonte: Diagnóstico, Cenários e Resultados", October 2009
- McKinsey (2009a). Roads Towards a Low Carbon Future: Reducing CO₂ Emissions from Passenger Vehicles in the Global Road Transportation System.
- McKinsey (2009b) Indian cost curve.
- Millard-Ball, A., and L. Ortolano, (2009). *Constructing carbon offsets: The obstacles to quantifying emission reductions*. *Energy Policy* 38 (2010) 533–546
- Nakhoda, S., (2009) "Catalyzing Low Carbon Development? The Clean Technology Fund" WRI Working Paper. World Resources Institute, Washington DC. Online <http://www.wri.org/iff>
- OECD/IEA (2005) *Saving oil in a hurry*. Paris.
- Republik of Indonesia, 2009. Technology Needs Assessment.
- Sanchez, S., (2008). Reforming CDM and Scaling-Up Finance for Sustainable Urban Transport, in: "A Reformed CDM – including new Mechanisms for Sustainable Development", UNEP-RISOE Center, Perspective Series 2008

- Schneider, L., (2007). Is the CDM fulfilling its environmental and sustainable development objectives? An evaluation of the CDM and options for improvement. Report prepared by Öko-Institut for WWF.
- SEMARNAT (2009). 'Programa Especial de Cambio Climático 2009-2012'. Available at http://www.semarnat.gob.mx/queessemarnat/politica_ambiental/cambioclimatico/Pages/pec.c.aspx
- Sutter, C., (2003). Sustainability Check-up for CDM Projects. Ph.D. Thesis.
- Taga, F., (2009). Hacia un transporte sustentable de bajo carbono en LAC: Experiencia del BID. Side Event: Promoting a Regional Approach to Environmentally Sustainable Transport in LAC, IDB – CAI – CTS México.
- UNEP/Risø (2009). CDM pipeline December 1, 2009. www.cdmpipeline.org
- UNFCCC (2005). Modalities and procedures for clean development project activities.
- UNFCCC (2007). Bali Action Plan. FCCC/CP/2007/6/Add.1
- UNFCCC (2009a). Item 3 of the provisional agenda: "Consideration of further commitments for Annex I Parties under the Kyoto Protocol". AWG-KP, 10th Session, Copenhagen, December 2009. FCCC/KP/AWG/2009/10/Add.3/Rev.3
- UNFCCC (2009b). Item 3 (b) of the provisional agenda: "Consideration of further commitments for Annex I Parties under the Kyoto Protocol Proposal by Parties on issues outlined in the work programme of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol". AWG-KP, 8th Session, Bonn, June 2009.
- UNFCCC (2009c). Report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention on its seventh session, held in Bangkok from 28 September to 9 October 2009, and Barcelona from 2 to 6 November 2009. FCCC/AWGLCA/2009/14
- Woodcock, J., P. Edwards, C. Tonne, B. G. Armstrong, O. Ashiru, D. Banister, S. Beevers, Z. Chalabi, Z. Chowdhury, A. Cohen, O. H. Franco, A. Haines, R. Hickman, G. Lindsay, I. Mittal, D. Mohan, G. Tiwari, A. Woodward, I. Roberts, "Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport" *The Lancet, Health and Climate Change 2*, Published Online November 25, 2009.
- World Bank (2007). *A Decade of Action in Transport – An Evaluation of World Bank Assistance to the Transport Sector, 1995-2005*. URL: <http://web.worldbank.org/WBSITE/EXTERNAL/EXTOED/EXTTRANS/0,,contentMDK:21174378~pagePK:64168427~piPK:64168435~theSitePK:3300525,00.html>
- World Bank (2008a). Safe, Clean, and Affordable... Transport for Development. The World Bank Group's Transport Business Strategy for 2008-2012
- World Bank (2008b). *Clean Technology Fund*. URL: http://siteresources.worldbank.org/INTCC/Resources/Clean_Technology_Fund_paper_June_9_final.pdf
- World Bank (2008c). Illustrative Investment Programs for Clean Technology Fund. Design Meeting on Climate Investment Funds Washington, D.C. April 14-15, 2008. Available at http://siteresources.worldbank.org/INTCC/Resources/Illustrative_Investment_Programs_for_Clean_Technology_Fund.pdf
- World Bank (2009). Transport Lending Trends 1996–2007. <http://go.worldbank.org/KM9OPODLQ0>
- Yao, X., (2009). Helping Achieve Seamless, Sustainable and Open Transport Systems in Asia. 6th APEC Transportation Ministerial Meeting (TMM6), 27-29 April 2009, Manila, Philippines

Annex 1: “Supported” NAMA Flow-chart

Step	Description	Remarks
Identification	<ul style="list-style-type: none"> ▪ Initiators of NAMA can be various organizations, both at national and at local government level; ▪ Initial identification of NAMA to be documented in concept paper ▪ Designated national authority” to give go-ahead for detailed formulation of NAMA ▪ Registration of potential NAMA with NAMA registry 	<ul style="list-style-type: none"> ▪ “DNA” not necessarily the same as for CDM ▪ This will allow NAMA registry to plan possible future financial commitments
Formulation	<ul style="list-style-type: none"> ▪ Responsibility for formulation of NAMA to rest with lead organization supported by team of organizations to be involved in NAMA ▪ Detailed formulation of NAMA to indicate the relationship with national climate change policy/action plan as well as with relevant sector policies or other national/local development plans ▪ Proposed MRV arrangements for both GHG emission reductions as well as co-benefits ▪ Financing structure which outlines the funding from mitigation fund as well as other funding sources (domestic funding, including user payments; grants and loans from development assistance; possible other climate funds) ▪ Institutional arrangements for implementation of NAMA 	<ul style="list-style-type: none"> ▪ It is expected that technical assistance facility will be created under UNFCCC to assist in the detailed formulation of NAMA ▪ In many cases base line, data availability will be a key issue. In these cases the NAMA can have an in-built MRV component which will help to generate the data for validation
National Review	<ul style="list-style-type: none"> ▪ Consistency with national-local climate, sectoral and developmental goals ▪ Economic and financial viability ▪ Replicability and potential for scaling-up ▪ Risk analysis 	<ul style="list-style-type: none"> ▪ Economic viability to incorporate co-benefits
International Review	<ul style="list-style-type: none"> ▪ Technical and Environmental Analysis on whether the proposed NAMA will generate stated benefits ▪ Review proposed MRV concept ▪ Compliance with possible financing, regional and sectoral allocation criteria 	<ul style="list-style-type: none"> ▪ The international review will assess the quality of the national review and will not be a stand-alone review of the proposed NAMA
Implementation	<ul style="list-style-type: none"> ▪ NAMA is implemented according to approved concept following institutional framework 	
Monitoring and Reporting	<ul style="list-style-type: none"> ▪ Implementation of MRV concept by lead organization ▪ Quality review of MRV process by :”DNA” ▪ Modification of NAMA design based on results of MRV process 	<ul style="list-style-type: none"> ▪ NAMA MRV which is focusing on GHG and co-benefits will have to be linked to regular project monitoring ▪ NAMAs are expected to have a

Step	Description	Remarks
	<ul style="list-style-type: none"><li data-bbox="402 247 899 306">▪ MRV of financial assistance by NAMA Registry	life time that can extend up to 10-20 years. This makes it important to build in possibility for modification of NAMA design as result of MRV and regular monitoring and evaluation

Annex 2: NAMAs and the Transport Sector in Developing Countries²⁵

Issue	Background-Explanation	Transport sector relevance/implications
A. Defining supported Transport NAMA's		
“Sustainable Development”	<p>“Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner” (UNFCCC, 2009c)</p> <p>CDM has generally not been able to reward projects with high level of co-benefits</p>	<ul style="list-style-type: none"> ▪ Non-climate benefits from interventions in the transport sector are often much larger than climate benefits (if both are monetized). This would make it important that guidelines for (transport related) NAMAs explicitly include the inclusion of non-climate related benefits in financing, MRV and institutional arrangements
“Ambition level”	<p>“The NAMAs by developing country Parties shall be formulated consistent with the levels of ambition needed to contribute to meeting the ultimate objective of the Convention” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ To accomplish substantive deviations from the Business as usual scenario generally a combination of measures will be required. The impact of NAMAs dominated by technological measures aimed at reducing emissions from individual vehicles will be moderate compared to NAMAs which include also non-technological measures. This because of the rapid increase of the number of vehicles which will negate the impact of improvements of efficiency of individual vehicles
“Context specific”	<p>“The NAMAS by developing country Parties shall be different for different groups of countries, depending on the level of development of their economies and on their respective capacities and specific national circumstances” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ There are considerable differences in the composition of transport fleet in developing countries in terms of: (a) motorized – non motorized transport, (b) length and purposes of trips, (c) 4 wheeled versus 2-3 wheeled vehicles, (d) gasoline – diesel – CNG, (e) urban – rural, (f) passenger – freight. This need to be reflected in NAMA design. ▪ The level of technology deployed in different countries can vary greatly with some countries largely dependent on imported second hand vehicles (e.g. Africa, Mexico) and other groups of countries with largely new vehicle fleets. This will also shape NAMA design in these countries.

²⁵ This Annex has made use of UNFCCC (2009c) which in its Annex contains the different non-papers which are an outcome of discussions in AWG-LCA meetings in 2008 and 2009 and Aree Kim (2009) for references to the characteristics of NAMAs and identification of key issues.

Issue	Background-Explanation	Transport sector relevance/implications
		<ul style="list-style-type: none"> ▪ Some countries still have relatively large Non Motorized Transport modal share while in other developing countries this has been abandoned largely, especially in the cities. ▪ Some countries and cities have formalized public transport systems while others have mostly informal transport systems.
“National Level”	<p>Implementation of NAMAs affects GHG trajectories at a national and/or sectoral level or the national baseline</p> <p>“NAMAs shall be verified at the national level” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ The bulk of transport mitigation actions can best be taken at the sub-national level. This reflects the institutional mandates for transport systems which in many cases are the city or province/state level. ▪ if it concerns technological measures related to vehicle design, efficiency or if it concerns regulatory actions on fuel mitigation measures in the transport sector can be best taken at the national level. ▪ Transport NAMAs can include both national and local level in those cases where the national level has a responsibility for (partial) funding of improvements in transport systems at the local level. See examples of Jawal Nehru Urban Renewal Mission in India and World Bank CIF/CTF program in Mexico
“Dynamic”	<p>“NAMAs by developing country Parties should evolve over time as their respective national circumstances, economic development and respective capabilities change”. (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ Sequencing of interventions in the transport sector is important. Often capacity building and policy formulation needs to precede actual investments for the latter to be effective. Capacity building should be continued during the implementation of actual investments. ▪ The time frame to generate emission reduction impacts for the individual components of “Avoid –Shift – Improve” approach differs. The impact of “Avoid” related measures accomplished through e.g. land use planning is medium to long term while certain regulatory actions will generate measures on the short and medium term.
“barriers”	<p>“Identify barriers to the implementation of domestically funded action, including identifying technology needs and barriers to technology deployment and diffusion, whose removal needs support” (Aree Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ Barriers with respect to transport and climate change are manifold and include: institutional, capacity, public-private financing frameworks, assessment methodologies, legal, or regulatory. NAMA can be developed to eliminate such barriers.

Issue	Background-Explanation	Transport sector relevance/implications
"additionality"	<p>"Are the NAMAs covered under the framework going to bring about low-carbon and low-GHG outcomes beyond what is already occurring?" (Aree Kim, et. al. 2009)</p> <p>"Additional or supported actions" on the other hand, which would require assistance, due to their incremental costs, in the form of financing, technology or capacity building for implementation (e.g. in the buildings or transport sectors)" (Aree Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ Additionality is a concept derived from CDM and was introduced to ensure the quality of off-sets realized. Since in the case of supported NAMAs no off-setting takes place this criterion may be less important. There will be still a need to create trust that funds are used for climate purposes, and to measure the global progress to the ultimate objective of reducing GHG emissions. (See also section MRV part below) ▪ Because of the close linkages between climate change and other sustainability issues (pollution, congestion) and more general development issues such as energy security and urban development it is hard to determine the "Additionality" of a specific transport intervention or measure. While the measure might be additional from a climate policy perspective it might not be from more general environmental/developmental perspective or transport policy perspective. ▪ NAMAs in the transport sector can help to accelerate the introduction and implementation of different policies and programs. This can be more easily accomplished if up-front assistance is provided.
" Enabling activities"	<p>"Enabling activities, such as preparation and elaboration of low-emission development plans and strategies and planning and elaboration of NAMAs, and related capacity-building, carried out by developing country Parties shall be supported on the basis of the agreed full costs" (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ Enabling activities are important in the case of transport and climate change. In addition to the development of plans and strategies, and capacity building there is a broad need for improvement of data availability on transport and climate change. ▪ Considering the importance of co-benefits, which in many cases provide the leverage to adopt and implement certain policies, programs and projects in the transport sector it important that adequate upfront support is available for the development of MRV methodologies which quantify these co-benefits.

Issue	Background-Explanation	Transport sector relevance/implications																							
"Eligibility criteria"	<p>"Support provided through the registry should not be channeled solely to actions that achieve direct emission reductions. Support should be provided according to type of action" (Aree Kim, et. al. 2009)</p> <p>"technology cooperation and transfer, capacity-building, financial resources and compensation" (Aree Kim, et. al. 2009)</p>	<table border="1"> <thead> <tr> <th data-bbox="831 327 967 478"></th> <th data-bbox="967 327 1125 478">Investment Financial Support</th> <th data-bbox="1125 327 1258 478">Capacity Building</th> <th colspan="2" data-bbox="1258 327 1429 478">Technology Cooperation and Transfer</th> </tr> </thead> <tbody> <tr> <td data-bbox="831 478 967 537">Avoid</td> <td data-bbox="967 478 1125 537">xx</td> <td data-bbox="1125 478 1258 537">xxx</td> <td colspan="2" data-bbox="1258 478 1429 537">x</td> </tr> <tr> <td data-bbox="831 537 967 596">Shift</td> <td data-bbox="967 537 1125 596">xxx</td> <td data-bbox="1125 537 1258 596">xxx</td> <td colspan="2" data-bbox="1258 537 1429 596">xx</td> </tr> <tr> <td data-bbox="831 596 967 655">Improve</td> <td data-bbox="967 596 1125 655">x</td> <td data-bbox="1125 596 1258 655">xx</td> <td colspan="2" data-bbox="1258 596 1429 655">xxx</td> </tr> </tbody> </table>					Investment Financial Support	Capacity Building	Technology Cooperation and Transfer		Avoid	xx	xxx	x		Shift	xxx	xxx	xx		Improve	x	xx	xxx	
	Investment Financial Support	Capacity Building	Technology Cooperation and Transfer																						
Avoid	xx	xxx	x																						
Shift	xxx	xxx	xx																						
Improve	x	xx	xxx																						
B. MRV of supported Transport NAMAs																									
"Baseline"	<p>"Enhanced national/international action on mitigation of climate change" (Aree Kim, et. al. 2009)</p> <p>"Implementation of NAMAs affects GHG trajectories at a national and/or sectoral level or the national baseline" (Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ Baseline emissions for the transport sector in developing countries are generally poorly documented and in many cases not adequate to be used in its current state to plan and account for supported NAMAs. ▪ Emission estimates are weak both for current levels and especially so for projected BAU emissions. There is need for consensus building around assumptions on which expansion of transport sector is being modeled by different groups. ▪ There are specific problems with defining the emissions of subsectors within land transport (passengers and freight) and to define emissions of sub-national jurisdictions (Provinces/States and Cities). This is important because transport NAMAs will in many cases be at level of sub-sector or of specific city. ▪ General weakness related to baselines is the absence of reliable activity data. 																							

Issue	Background-Explanation	Transport sector relevance/implications																
<p>“MRV for NAMAs”</p>	<p>What needs to be measured (e.g. GHG outcomes, intermediate outcomes, or inputs)?</p> <p>“Provide an estimate, including methodology used, of the projected emission reductions as a result of the implementation of NAMA, or a set of NAMAs, over the lifetime of the NAMA(s)” (Aree Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ Considering the strategic importance of other objectives to launch mitigation objectives in the transport sector it is important to measure these co-benefits as well. ▪ MRV of GHG impacts will be a mixture from actual measurements of GHG emission reductions and indirect or proxy indicators and in some cases process indicators. Direct GHG impact indicators represent the “gold standard” in terms of indicators. Where such direct indicators are not available use can be made of proxy indicators (for example kilometers of bicycle lane constructed), or even of process indicators (number of people trained). <table border="1" data-bbox="841 779 1417 1077"> <thead> <tr> <th></th> <th>Direct GHG indicators</th> <th>Proxy indicators</th> <th>Process Indicators</th> </tr> </thead> <tbody> <tr> <td>Avoid</td> <td>x</td> <td>xxx</td> <td>xx</td> </tr> <tr> <td>Shift</td> <td>xx</td> <td>xx</td> <td>x</td> </tr> <tr> <td>Improve</td> <td>xxx</td> <td>x</td> <td>x</td> </tr> </tbody> </table>		Direct GHG indicators	Proxy indicators	Process Indicators	Avoid	x	xxx	xx	Shift	xx	xx	x	Improve	xxx	x	x
	Direct GHG indicators	Proxy indicators	Process Indicators															
Avoid	x	xxx	xx															
Shift	xx	xx	x															
Improve	xxx	x	x															
<p>C. Financing Supported Transport NAMAs</p>																		
<p>“Earmarking”</p>	<p>CDM experience was that very limited funds went to transport sector</p>	<ul style="list-style-type: none"> ▪ Reflecting the importance of the transport sector as a source of emissions it can be argued that it is important to reserve a % of NAMA funds for transport sector (combined with a possible geographical allocation). Similarly geographical earmarking can help to ensure that the transport sector in all developing countries can benefit and not just in a few countries. The role of NAMAs is to enhance mitigation action. This can be best achieved through a structural transformation of the transport sector. Paradigm shifts happen less easily if funding is allocated to a limited number of countries (even if those countries are responsible for a majority of the emissions). 																

Issue	Background-Explanation	Transport sector relevance/implications																
<p>“ Incremental costs”</p>	<p>“Implementation of NAMAs shall be supported on the basis of agreed full incremental costs” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ Many of the transport interventions have no, or limited incremental costs (against benefits) particularly if all co-benefits are fully monetized. (Co-benefits often generate “economic” benefits which accrue to society rather than “financial” benefits (as in the case of CDM) which accrue to the project owner. This could help explain limited progress in internalizing co-benefits). ▪ Depending on what you define as NAMA, if you also consider the capacity building and other elements (e.g. development of strategies, regulatory changes) as part of the NAMA, there might be components which could be supported based on the full cost. 																
<p>“NAMA financing”</p>	<p>“Specify, when relevant, the type of support in terms of finance, capacity-building and technology it considers most appropriate to enable the implementation of the NAMA and when financial support is sought, an estimate of the amount of support required” (Aree Kim, et. al. 2009)</p> <p>“Presumably beyond the total implementation cost of the measure there would be some sub-set of cost which would be covered through external mitigation support, with the difference between total implementation cost and external support being the share that would be covered internally from domestic public or private finance.” (Aree Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ In funding transport NAMAs it is important to consider the respective responsibilities of government, private sector and public/users. In several cases the cost of developing policy or regulation falls to the government but its implementation is the responsibility of the private sector which has the possibility to pass on costs to the end users. In several cases, issuance of regulation will result in a different use of financial resources but not necessarily higher costs (e.g. land use – transport planning) <table border="1" data-bbox="841 1171 1430 1499"> <thead> <tr> <th></th> <th>Domestic funding – new funds</th> <th>External Public Funding</th> <th>Private sector funding</th> </tr> </thead> <tbody> <tr> <td>Avoid</td> <td>xx</td> <td>xx</td> <td>xxx</td> </tr> <tr> <td>Shift</td> <td>xxx</td> <td>xxx</td> <td>xxx</td> </tr> <tr> <td>Improve</td> <td>x</td> <td>x</td> <td>xxx</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ▪ In many developing countries there are considerable distortions in pricing of transport and transport subsidies which result in a situation promotes private motorized transport over more sustainable modes like Non-motorized Transport and Public Transport. Their elimination can help generate domestic public finance required for implementation of NAMAs. 		Domestic funding – new funds	External Public Funding	Private sector funding	Avoid	xx	xx	xxx	Shift	xxx	xxx	xxx	Improve	x	x	xxx
	Domestic funding – new funds	External Public Funding	Private sector funding															
Avoid	xx	xx	xxx															
Shift	xxx	xxx	xxx															
Improve	x	x	xxx															

Issue	Background-Explanation	Transport sector relevance/implications
		<ul style="list-style-type: none"> ▪ In budgeting for transport NAMAs it is important to distinguish between enabling/ pre-implementation activities and the actual implementation costs of the NAMA.
“Linkage to other financing modalities”	Transport interventions are expected to be funded from range of sources	<ul style="list-style-type: none"> ▪ Based on current scenarios it is expected that funding for development of the land transport sector in developing countries will come primarily from resources in the developing countries themselves. Unlike the energy and building sector the largest share will come from public sector and not the private sector. The second largest source of funding is and will be development assistance. New UNFCCC mitigation and technology funds as well as GEF and other dedicated climate funds will only provide small share of transport funding. ▪ To maximize impact it is best if dedicated climate funds are used to enable, facilitate, catalyze a broad range of Avoid-Shift-Improve related interventions in the transport sector through partial funding rather than to fully fund a limited number of individual projects. This will require the development of a methodology that can be used to structure the funding of future transport interventions.
“owner-recipient of financial support”	In CDM the ownership of CERs and associated income is well organized. No guidance exists yet for NAMAs.	<ul style="list-style-type: none"> ▪ In the case of (transport) NAMAs the formal recipient of external financial support is expected to be the national government. The implementation of transport NAMAs will in many cases be other departments in the government, sub-national organizations (states/provinces or cities) or entities outside the government (private sector, corporatized government companies). In many cases no effective structures are in place for passing on of such funds and their reporting. It is important that these are developed in a timely manner. ▪ By specifying in the NAMA proposal which amount of financing is supposed to be spent on which actions, the national government could commit to passing on the funds to the institution mentioned to be responsible for the respective action.
“cost effectiveness”	“Enable cost-effectiveness so as to ensure global benefits at the lowest possible cost” (Aree	<ul style="list-style-type: none"> ▪ Cost effectiveness depends on the manner it is defined. A narrow interpretation which focuses only on the cost of GHG emissions

Issue	Background-Explanation	Transport sector relevance/implications
	<p>Kim, et. al. 2009)</p> <p>“Is the linking framework designed to target support to NAMAs in a manner that delivers least-cost mitigation and maximises the performance of necessarily limited public support?” (Aree Kim, et. al. 2009)</p>	<p>realized, and which excludes various societal benefits realized which are directly associated with the intervention would most likely disqualify the transport sector largely from NAMA funding. If indirect effects are included (e.g. of land use planning) or if co-benefits are taken into consideration costs effectiveness of measures in the transport sector will be more favorable.</p>
“payment regime”	<p>One time or annual payments.</p> <p>“Actions are dependent on financing or financing is dependent on actions?” ((Aree Kim, et. al. 2009)</p> <p>“With respect to a non-market or public assistance mechanism, the key design challenge will be to determine who and what activities are eligible for assistance and then to disburse the support in a manner that is cost-effective, such that it maximises results across agreed objectives for a given investment”. (Aree Kim, et. al. 2009)</p>	<ul style="list-style-type: none"> ▪ Basic feature of CDM is that it generates recurrent income and not the “upfront financing” that is required for systematic changes – funding institutions, capacity building, infrastructure, systems etc. No final detail exists whether supported NAMAs will include recurrent payments or whether payments will be geared towards creating/transforming energy/transport systems which have reduced GHG emissions but not fund the actual operation of such systems. ▪ The majority of transport sector interventions have negative incremental social costs when associated environmental and other benefits would be monetized. If it is possible to capture these other benefits and transfer them to operators of transport systems /owners of transport interventions then it would make good sense that NAMA support is directed towards development of transport interventions. Less NAMA support would required for operation and maintenance of transport intervention because owners of interventions would derive income from monetized co-benefits. The issue is that of public goods – most benefits accrue socially, whilst (direct) costs are incurred privately. Therefore the need for effective regulation, pricing, redistribution mechanisms etc.
“MRV financial support”	<p>“Annex II Parties must therefore meet their commitments for the provision of financial support” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ Transport interventions, especially if they are “Avoid or Shift” in nature will require considerable time before they generate emission reductions. It is important therefore to link financial disbursement schedule to clear milestones in the development and implementation of NAMAs
“Fast starting	<p>As proposed amongst others by the EU to allocate funding in</p>	<ul style="list-style-type: none"> ▪ This is especially relevant to the transport sector and can be used to: (a) improve

Issue	Background-Explanation	Transport sector relevance/implications
finance”	the 2010 -2012 period to kick start mitigation measures	transport data and baselines, (b) develop institutional coordination and capacity to implement “Avoid-Shift-Improve” interventions, (c) develop integrated co-benefit assessment methodologies, (d) develop financing models for various types of transport NAMAs, and (e) pilot transport NAMAs.
D. Institutional Arrangements for Supported Transport NAMAs		
“Integration in national strategy”	<p>“A long-term strategy for low greenhouse gas emissions development, up to 2050, including the emission pathway envisaged to be achieved through the implementation of a low-emission [high growth sustainable] development strategy” (UNFCCC, 2009c)</p> <p>Low Emission Development Strategies</p> <p>National Schedules</p>	<ul style="list-style-type: none"> ▪ The adoption of long term strategies, low emission development strategies or national strategies as basis for the formulation of NAMAs is still uncertain. The transport sector, or sub-sectors of land transport freight and/or passengers, will, like other sectors, have problems in complying with such a requirement, especially in those countries which have a weak baseline.
“Coordination mechanism/ Registry”	“Shall be supported by a technical panel to conduct technical analysis of all proposed NAMAs” (UNFCCC, 2009c)	
“MRV verification capacity”	<p>“NAMAs shall be measured at the national level in accordance with guidelines to be decided on by the COP, building on, inter alia, existing IPCC guidelines and involving regional centres and national experts”. (UNFCCC, 2009c)</p> <p>“The methodologies of the national verification process should be open to international auditing. If necessary, and subject to agreement by the developing country Party undertaking the NAMA, domestic verification may also be confirmed by an international verification process” (UNFCCC, 2009c)</p>	<ul style="list-style-type: none"> ▪ Broad based roll-out of transport NAMAs will require substantial strengthening of national and regional measurement capacity. This applies to all three categories of transport NAMAs: “Avoid – Shift – Improve”. National capacity differs among countries with some countries with reasonable capacity. Regional capacity is almost entirely missing in developing countries. ▪ Existing IPCC guidelines are mostly useful for general calculations of sector wide emissions but do not support the assessment of especially sub-national interventions where the use of fuel cannot be well determined, or allocated to specific modes.