**TST Issue Brief: Sustainable Transport [[1]](#footnote-1)**

**Summary - key messages**

*While transport is central to development many people in rural and urban areas do not have access to affordable, safe and clean transport. Transport services and infrastructure will be required to enable the mobility of people and goods needed for inclusive economic and social development and improved quality of life. Transport is central in shifting to sustainable low carbon societies but needs to be decoupled from impacts like air pollution, congestion, road traffic injuries and climate change. Key sustainability issues are: Rural and urban transport, air quality, road safety, and energy and climate.*

*• Urban transport systems can be improved through the development of well-designed mass transit systems linked with safe and attractive facilities for cycling and walking. An SDG target should be to double the number of people with access to affordable, quality mass transit.*

*• Rural transport services are critically important to development and agriculture. Reducing by 90% the number of people without access to maintained all-weather* ***A*** *roads or adequate transport services has been proposed as a target.*

*• Urban air pollution is a major threat to global human health, especially small particulates. The transport sector can lead in implementing an SDG target to bring the air quality of 1.5 billion people within WHO guideline limits, which can be achieved with existing technologies and policies.*

*• Road Safety is deteriorating and has become one of the main killers of pedestrians, especially young and vulnerable people. Many cities and countries have shown that achieving an SDG target of halving road fatalities worldwide is achievable.*

*• And transport plays an important role in using energy more efficiently and reducing greenhouse gas*

*emissions. The SDGs should include a target to double the efficiency of the global vehicle fleet.*

*These targets can be achieved using existing cost effective policies and technologies - many cities and countries have already achieved them. They need to be scaled up through inclusion of transport targets in the SDGs.*

**Introduction**

Transport involves everyone, every day, whether it is through walking, cycling, using public transport, driving a car, or through air and sea travel. Transport is central in goods movement and crucial for development and economic growth. It provides access to work, education, health services, and other public services. It also provides access to markets and supply chains. International transport of goods between countries is important for development and lack of infrastructure can increase costs and externalities.

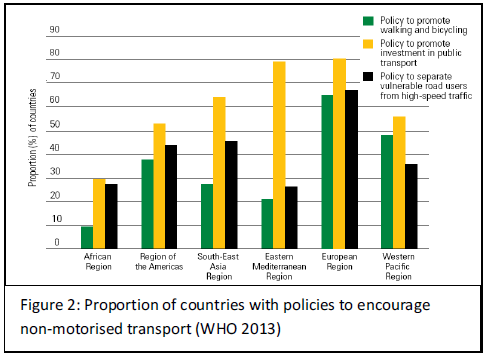
Current trends are still too focused on individual car use, exclude large groups in providing affordable quality mobility, are fossil fuels intensive, and have many negative effects such as road traffic injuries and climate change. Rio+20 recognised Sustainable Transport as an important area for follow-up and international support to developing countries. The High-Level Panel of Eminent Persons on the post-2015 Development Agenda included transport in two goals associated with energy and employment. Several Consultations have been undertaken on Sustainable Transport with many supporting the idea of "equitable access to goods and services through clean, safe, affordable, reliable transport and land use planning."

**Taking Stock**

Greenhouse gas emissions from the transport sector are growing faster than any other sector and are estimated to increase from one quarter today to one-third of all energy related C02 emissions by 2050 (IEA

2012). At the same time, over 1.2 million people were killed on roads in 2010 (WHO 2013) and small

particulate outdoor air pollution is estimated to result in more than 3.2 million premature deaths annually (Lim, 2012). Many cities in all regions of the world have come to a complete gridlock due to congestion, having major impacts on economic development. Nonetheless a growing number of countries and cities spearhead innovative solutions and showcase how transport can be more sustainable.

Paragraph 133 of the Johannesburg Plan of Action calls for the development of "sustainable transport systems, including energy efficient multi-modal transport systems, notably public mass transportation systems, clean fuels and vehicles, as well as improved transportation systems in rural areas". It also calls for support to developing countries to achieve this. However, as transport was not included in the MDGs and its targets, over the past decades the transport sector has not been given the attention it should and many transport related problems have increased. The development of a post 2015 framework provides an opportunity - a last chance that is - to integrate transport as a driver for sustainable low carbon societies.

Switching to a sustainable integrated transport approach needs special attention to related areas such as financing and infrastructure. Societies need to redirect investment in infrastructure that supports sustainable transport. So rather than investing (only) in highways - include dedicated bus lanes for bus rapid transit systems, and integrate safe walking and cycling facilities when building or upgrading urban roads. And invest in integrated goods transport - linking land (including rail) with sea transport. The resilience of transport infrastructure is also important in light of climate change adaptation. Transport infrastructure and systems should be adapted to extreme weather and global sea level rise - especially as transport infrastructure investments require a long time horizon. Proper adaptation is not only important for reliable transportation of people but also for the global delivery of goods, including energy and food. Rural accessibility needs to be improved through judicious upgrading of the road networks and ensuring maintenance and efficient performance of the infrastructure investments and transport services to facilitate sustainable development and food security. ***B***

**Options - Making Transport Sustainable**

The ultimate transport goal is to give citizens access to goods and services while minimizing negative external effects such as traffic injuries and emissions. This can be realized through an "Access-Shift- Improve" (ASI) approach: (i) provide equitable Access to jobs, goods and services while avoiding unnecessary motorised trips by smarter planning; (ii) Shift the transport of goods and persons to the most efficient mode, and; (iii) Improve the efficiency of transport by improved vehicle and fuel operations and technologies. Improve the transport infrastructure asset management by developing cost-effective road maintenance arrangements for these very substantial investments. Using an ASI approach can make transport sustainable in the following ways.

• Transport is a key driver for poverty reduction and social inclusion. Well-designed transport systems provide mobility for all groups in society. However, in many countries affordable mass transit systems do not exist, forcing people to pay a relative large share of their income on transport or restricting their access to workplaces, schooling, markets, healthcare and social networks. Well designed, intermodal transport systems are essential for the provision of goods and services, including food. Doubling the number of people with access to mass transit or non-motorised transport within an average half hour daily commute has been proposed. Similarly access to transport by road or other means in rural areas within a half hour walk has also been proposed.

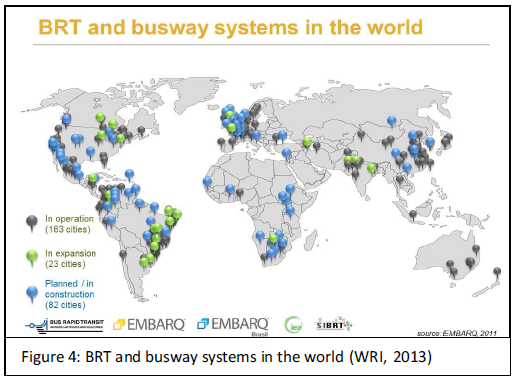
• Cleaner transport systems can improve the health of billions of urban residents. The transport sector is a major source of outdoor air pollution. In cities around the world, transport is often the main source of air pollution. Many different types of air pollutants have adverse health impacts, and especially small particulates, called PM 10 and PM 2.5. PM pollution penetrates deep into the lungs and blood stream and is a major cause of heart and respiratory disease, and also a leading cause of cancer (IARC, 2012). According

to the WH0 PM pollution affects more people than any other pollutant (WH0 2011). Rio+20 called for the reduction of non-communicable respiratory diseases. Growing reliance on private vehicle travel is also a key driver of physical inactivity- increasing the risk related to non-communicable diseases (NCDs).

• Transport provides cost effective opportunities to reduce global greenhouse gas emissions. Today the knowledge, policies and technologies are available to shift towards a more sustainable low carbon transport pathway. And we can do this while saving resources: mass transit can provide mobility for many, reducing the need to build additional roads; the efficiency of the global vehicle fleet can be doubled using existing policies and technologies saving billions of dollars in fuel; building walking and cycling paths in our cities only costs a few percentage points of road investment.

* Poor road maintenance has caused widespread wastage of the considerable past investments in infrastructure assets. This irresponsible approach must be consigned to history and sound financing and asset management of the infrastructure assets must be introduced universally to improve the sector efficiency and performance. (see accompanying document entitled ***“How much should Developing Countries spend on Road Maintenance?”*) *C***

The future of the transport sector will see major changes. New models will be introduced that share vehicles and that will focus on inter-modal connectivity, new technologies will be low and no-carbon ***D***, and the use of IT will provide new opportunities. Only by providing an integrated approach to the transport sector, rather than focusing on different modes in isolation, can the sector contribute optimally to the economic development, greater productivity, a low carbon society and a healthier population. Trade, goods and services will benefit from better interconnected inter-modal and cross border transport especially for Land Locked Developing Countries (LLDCs) and Small Island Developing States (SIDS). Using inland and coastal waterways and modal shifts to rail, moving away from infrastructure attempting to support an unsustainable road focussed transport model, all provide clear climate, movement and cost benefits for the freight sector. And will provide sustainable solutions to rural access with local resources.

**Way Forward - What Needs to be Done**

There are several key areas where the transport sector is fundamental to achieving sustainable development:

**1- Access to integrated urban transport systems,**

**and improved rural roads and transport services**

By default or design, world-wide transport systems are still mainly based on private car use. A move from individual car use to public transport is needed, to address congestion, improve access

and for environmental reasons. Integrated urban transport systems involve walking, cycling, cars, buses, and mass transit systems. Important is the feed-in of non motorised transport into mass transit systems. Mass transit systems should be affordable so that they provide maximum access - especially to the poor and other groups like children and people with a disability. Moreover, the lack of safe and affordable transport restricts the mobility of women and prevents their full participation in the economy and other activities. Urban transport systems need to be designed based on participatory approaches to maximize usage. In Latin America major cities such as Bogota have showcased bus rapid transit systems - that are capable of quickly and safely transporting many people in and out of the city. In many regions, and especially in Asia, despite the introduction of mass transit systems more needs to be done to maximize their use through better integration of other transport modes, especially non motorised transport. In Africa there is an urgent need to expand the current number of only three BRT systems - many cities and countries are planning mass transit systems.

Rural transport systems provide development opportunities of the rural areas, including access to food, services, markets and income, especially for the small scale agricultural sector. Cities depend on transport systems to provide them with food and other resources from the rural areas. Therefore, more attention should also be given to the integration of urban-rural and regional and inter-city transport development. Major improvements in accessibility and performance of the rural transport systems are achievable through widespread application of proven techniques and available knowledge, optimizing use of local resources. ***B***

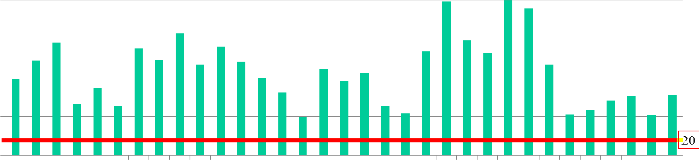
***Proposed mass transit SDG target - double the number of urban citizens that have access to integrated mass transit systems by 2030.*** This can be achieved by supporting the up-scaling of mass transit systems, using innovative financing models. Many organisations are supporting countries and cities to develop mass transit systems but much more effort is needed to scale up this model. A similar target could be developed for access to all weather roads for rural populations.

***Proposed Rural Transport SDG target - Reducing by 90% the number of people without access to maintained all-weather roads or adequate transport (road, rail or waterborne) services by 2030.*** Access being defined as living within 2km or 30 minutes walking distance. ***E***

**2- Urban Air Quality**

Urban air pollution is a major killer and getting worse in many cities. Small particulate is one of the largest health hazards globally (WH0 2011). A recent study shows that at least 3.2 million people die prematurely every year from outdoor PM pollution (Lim, 2012). Today many large

cities far exceed WH0 guidelines for average PM10 concentrations (see Figure 3). A recent European Environment Agency study estimates that more than 90% of people living in European cities breathe air that result in respiratory



***= 20ug/m3 WHO PM10 Annual Air Quality Guideline***

Figure 3: PM levels in selected cities (WHO)

problems, heart disease and shortened lives (EEA, 2013). Overall, transport is responsible for the largest share of PM emissions in cities. An important cause for this is the use of dirty fuels and vehicles - for example in 0ECD countries diesel fuel contains as little as 10 parts per million (ppm) sulfur, while in Africa many countries are above 5,000 ppm. 0n the vehicles side, the introduction of progressive vehicle emissions standards is essential, as is the regulation of the export of used vehicles to developing countries. Introduction of cleaner fuel and cleaner vehicles - personal vehicles, two and three wheelers, and buses and freight - can help address this. Together with mass transit systems, safe walking and cycling networks this can create a cascade of health benefits - better pedestrians safety, improved physical activity, and dramatically improved urban air quality. Reducing small PM has as added benefit that it also reduces black carbon, an important short lived climate pollutant.

***Proposed air quality and health SDG target - Bring urban air pollution within WHO limits for an additional 1.5 billion urban residents by 2030.*** This can be achieved if countries would adopt low sulphur fuel standards and introduce progressive vehicles standards reducing 90% or more of harmful emissions (ideally hand in hand with other transport interventions promoting public and non-motorised transport). Leading global UN based initiatives such as the Climate and Clean Air Coalition and the Partnership for Clean Fuels and Vehicles are supporting this.

**3- Road safety**

1.24 million people are killed every year and 20 to 50 million are injured and disabled due to road traffic accidents. Road traffic injury is the leading cause world wide of death for young men aged 15-29 yrs. In East Africa road fatalities are more than 7 times higher than in some European countries. In the past twenty years road deaths have increased in Sub Saharan Africa by over 80% (WHO, 2013). In Latin America, the majority of these deaths occurred among vulnerable road users, pedestrians accounting for almost one- third.

In 2011 the UN Decade of Action for Road safety was launched through a UN General Assembly resolution with the support of more than 100 governments. Its Global Plan promotes proven cost effective solutions such as better designed roads, with facilities for non-motorised transport users, application and enforcement of strict regulations such as on vehicles road worthiness and seat belts, and safer roads use, such as through speed reductions. More mass transit systems would also assist in reducing road traffic accidents.

***Proposed health and road safety SDG target - to reduce road fatalities by half by 2030.*** This can be achieved if countries adopt a set of road safety measures outlined in the Global Plan of Action. Many organizations are working to implement the Decade of Action plan to achieve this.

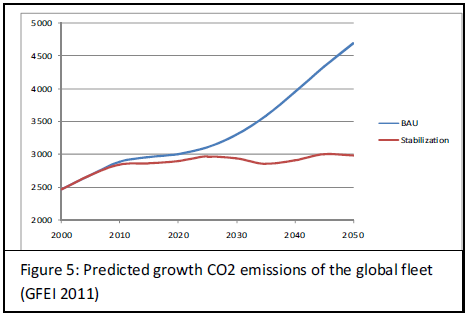
**4- Energy and Climate**

Transport is a major consumer of fossil fuels. Today's global vehicle fleet is estimated at around one billion vehicles, and is set to double or even triple in the coming decades, with 90% of this growth taking place in non-0ECD countries (see figure 1). Improving the efficiency of vehicle fleets has many positive impacts - reduced greenhouse gas emissions, reduced energy dependence, reduced oil and fuel use, and cheaper and cleaner transport. There is a large group of countries, 0ECD and non-0ECD, that have put in place

measures to improve the fuel efficiency of their vehicle fleet. These countries are making major progress with reducing fuel consumption - currently at a rate of close to 7% improvement per year (GFEI/IEA 2012). However a similarly large group has not put in place measures and their average fuel economy is not improving at all. With the vehicle fleets expected to grow especially in these "stagnant" countries, the global fleet C02 emissions are set to double or triple - while these could be halved if fuel economy policies would be introduced globally (see figure 5). The Sustainable Energy for All and the High Level Panel report both recommend improvement of fuel economy as a priority for better energy efficiency.

Proposed energy and climate SDG target - Double the efficiency of the global fleet, in 2030 for all new vehicles and by 2050 for the complete global fleet. This can be achieved through the global adoption of fuel economy policies. The UN is working with leading global transport partners in the Global Fuel Economy initiative that is working towards this target at global and national level worldwide.

These five priority targets are by no means the only transport actions that need to be undertaken. Moving towards sustainable transport systems needs actions in many more areas. A post 2015 sustainable development framework should consider additional activities and targets in following areas:

* *The logistics and freight sector* combine land, air and maritime. Freight movement comprise of one third of transport energy use, three-quarter of this is land-based (IPCC 2007). Freight is a disproportionate high emitter of black carbon (because of its use of heavy duty diesel engines). However, there are excellent freight and logistics initiatives improving the efficiency and reducing harmful emissions.

*• Non-land based transport* - 90 percent of the global trade volume is carried by sea. Ships are closely linked to on-shore activities, especially ports and land freight

transport systems. Targets should be set to continue reducing pollutants, building on existing agreements, with a special focus on PM and climate emissions - both C02 and black carbon. The aviation sector is fully dependent on fossil fuels and while long term strategies need to look at alternatives, at the short term much efficiency improvements can be made including in operations at airports and through clean technology and better planning. In Europe short-haul flights are being shifted to high speed rail with significant benefits.

• Subsidies - that promote the use of unsustainable transport modes - in particular fossil fuel subsidies - should be removed. Fossil fuel subsidies were estimated at more than USD 400 billion in 2010 and provide a major draw on public funds in many countries. Although intended to assist the poor, fossil fuel subsidies benefit more the wealthy.

• Sustainable biofuels - use of biofuels for transport is increasing, often due to government policies promoting their use. Threats are the displacement of food crops for fuel crops, the expansion of

agricultural land into ecosystems rich in biodiversity or carbon, or displacement of small holder agriculture. Appropriate policies need to be put in place to avoid these externalities. Technologies focused on converting waste or sustainably harvested non-food crops are promising.

For all of these issues time is of the essence. There is only a small window of opportunity to introduce the necessary measures - it takes time for mass transit systems to be designed and build, it takes time to change urban planning paradigms and it takes time for new vehicles to replace old fleets.

For these actions to be successfully addressed several conditions need to be met.

• Transport needs to be given the political priority it deserves, as a social, economic and environmental issue and as an opportunity to contribute to sustainable development; with a paradigm shift from a focus on individual motor vehicle users to integrated multi modal transport approaches for people and goods.

• New approaches and technologies will need to be fast tracked and shared among countries. These include congestion charging, e-pricing, zoning, zero or low emissions vehicles, bike and car sharing programs, active (non motorised ) travel mode schemes.

• Major investments are taking place in transport - in the next decades hundreds of trillion of dollars will be spent on building transport infrastructure and in fuels and vehicles. Switching to a sustainable low carbon and resilient transport sector needs the existing investments to be redirected and be more sustainable. Seed funding is needed to support countries develop new transport approaches and strategies and adjust their financial and investment policy climates to support sustainable transport. Multilateral Development Banks, bilateral agencies and the UN can be called upon to assist with this shift in investment patterns.

• Governments need to work with the private sector and civil society to switch to more sustainable transport models. Through innovative public -private partnerships and through taking leadership the private sector can become a driving force to make transport efficient, affordable and cleaner. NG0s and

knowledge organizations have been taking the lead in promoting alternative models and scenarios. There is

a wealth of knowledge and experience, at all levels, that can be used to achieve more sustainable transport systems.

• Capacity building and exchange of knowledge and technologies will be key pillars.

• And a move to a more sustainable transport sector will need coordinated action at all levels; at the city level - with introduction of integrated urban transport systems; at national level - setting cleaner fuels and vehicles standards; at regional level - for much needed harmonization; and at the global level - where knowledge and technology need to be shared and where UN agencies play a central role in promoting more sustainable transport systems.

The transport community is diverse; governments are cooperating with non governmental organisations, the private sector, knowledge institutions and international organisations to develop transport programs as outlined in this brief. A feature of some of the most successful programs is that they have involved all these groups in global and national activities. It is important, with such a diverse group of involved organisations, that coordination is effective. The transport community is now discussing, also on the basis of this brief, the development of a results framework that will provide clear targets and indicators for the role of transport

in the post 2015 SDGs.

Recognizing the importance that the transport sector plays in achieving sustainable development, transport interventions as suggested in this brief should be combined into one dedicated SDG, as they are closely interlinked. However, most important is that the key areas and targets as listed in this paper are included in the SDG framework.

Transport can make key contributions to all three pillars of sustainable development - economic, social and environmental. To do so it needs to be part and parcel of the post 2015 framework. There is no second chance, once cities have planned and developed, roads have been built, vehicle fleets have grown, it will be too late and far more costly to develop retrofit solutions. There is a short window of opportunity to shift to sustainable transport systems and the development of the SDGs provides an ideal opportunity to do this.

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• World Resources Institute (WRI ), 2013, [www.brtdata.org](http://www.brtdata.org/)

**Commentary on Proposed Text Changes**

1. In many economically developing regions, it is necessary to realize both the ***maintained*** transport infrastructure ***and*** the efficient transport services (whether wheeled, waterborne or airborne) for rural communities.

The previously proposed “halving” target is too modest. As discussed in later comments ***B***, improved basic all-weather access could be provided to the majority of those currently without it at quite modest cost using local resource based approaches. It is proposed to agree a target of “***Reducing by 90% the number of people without access to maintained all-weather roads or adequate transport (road, rail or waterborne) services. Access being defined as living within 2km or 30 minutes walking distance”.***

It is important to appreciate that a large scale road building programme is **NOT** required. Focus should be on rehabilitating and bringing existing network routes under effective maintenance and upgrading them where appropriate to maximize economic and social benefits and minimize environmental impact.

1. Over 1 billion people are without all-season access worldwide (IDA figures). Despite road networks being reasonably extensive in many developing regions, they are generally of poor standard and not properly maintained. For example, in Sub-Saharan Africa, a mere 15% of the network is paved or all-weather; with South Africa accounting for 40% of all paved roads in the region. At the extreme, South Sudan (area 620,000 km2 – similar in land area to France) has almost no paved roads (Faiz 2011).

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| **Table C1 - ACCESSIBILITY IN AFRICA (and UK for comparison)** | | | | | |
| Country | Classified Road Network: Km Paved | Classified Road Network: Total km | Percentage Paved | Population (millions) | Km of paved road / million population |
| South Sudan | 200 | 20,000 | 1% | 8 | 25 |
| Ethiopia | 7,476 | 149,177 | 5% | 83 | 90 |
| South Africa | 70,000 | 754,000 | 9% | 50 | 1,400 |
| UK | 394,000 | 394,000 | 100% | 62 | 6,355 |
| NOTES | | | | | |
| *1. South Sudan network not yet classified or inventoried, estimate only, World Bank estimate 2011* | | | | | |
| *2. Ethiopia: Federal, Regional, Community: Source Ethiopian Road Authority, 2010* | | | | | |
| *3. South Africa Government, 2012* | | | | | |

However, an 'all-weather' road does not have to be (problematic in terms of periodic maintenance re-gravelling liabilities) gravel, or paved. Maintained earth roads are cheap to construct and adequate on many soils and locations for low traffic flows (up to 50 motor vehicles equivalent per day). A catalogue of local resource based low cost durable paving options is recently available:

<http://r4d.dfid.gov.uk/pdf/outputs/AfCap/AFCAP-GEN-099-Rural-Road-Surfacing-and-Pavements-Guideline.pdf>

Earth, gravel and low cost durable paving for medium and higher traffic routes can be constructed and maintained at a fraction of the cost of conventional capital-intensive, heavy equipment based methods (developed for high labour cost, low investment cost economies) by the judicious use of low-capital, labour and intermediate equipment based methods, local enterprises and local materials.

Maintenance is the most cost effective investment that can be made in most road networks, yet hitherto it has been widely neglected. Many of the existing unpaved routes could be brought to a maintainable standard for investments of US$25,000/km or less and thereafter maintained to provide basic access for about US$500 – 1,000/km/year using local resource based methods (see accompanying document entitled ***“How much should Developing Countries spend on Road Maintenance?”*)**

These relatively low levels of required investment make the proposed “90% reduction” target achievable.

Effective network asset management and road maintenance needs to be introduced with a complementary range of initiatives to meet the range of sector challenges: (Paper by O’Neill et al in seminar: <http://pmgsy.nic.in/downloads/gsjanmarcheng10.pdf> )

These initiatives include improved local capacity for management of Transport Infrastructure and Services:

* *Develop and implement* ***pragmatic sector policies***
* *Improve sector* ***Performance & Value for Money***
* *Achieve improved and informed* ***Decision Making***
* *Improve* ***Access to Knowledge & Good Practice*** *for all*
* *Strengthen* ***sector Support Framework***
* *Improve sector* ***education, training and Continuing Professional Development*** *(CPD) for practitioners*
* *Improve & Coordinate* ***Research and Development***
* *Improve & properly resource the* ***Application links of the ‘Knowledge Chain’:*** *research* ⮚ *application*
* *Develop appropriate* ***standards, specifications and contract*** *or other delivery arrangements*
* *Develop awareness and application of* ***Whole Life Costing*** *and* ***local resource based approaches***
* *Involve, sensitive and* ***Mobilise the Key Stakeholders***
* *Establish* ***Long term vision and funding commitments***
* *Improve* ***cooperation*** *with other rural sectors and with planning, health and education responsibilities at national and local levels*
* *Improve delivery of* ***rural transport services***
* *Establish a* ***Knowledge Forum*** *that is collaborative, credible, objective, inclusive and sustainable.*

1. Road Maintenance funding and efficient implementation should be increased to between 0.2% and more than 1% of GDP, depending on the local operational environment and circumstances. (see accompanying document entitled ***“How much should Developing Countries spend on Road Maintenance?”*)**
2. The transport sector currently relies extensively on high carbon cement and bitumen based sealers and binders in road construction and capital-intensive equipment and fuel-intensive road maintenance. Proven and potentially lower carbon-intensive solutions are available in local resource based, bio-engineered and more durable, lower capital or lower maintenance paving options:

<http://siteresources.worldbank.org/EXTRURALT/Resources/515369-1264605855368/eco_roads.pdf>

1. A Rural Transport Target is essential.

A rationale SDG rural transport target for 2030 could be:

Reducing by 90% the number of people without access to maintained all-weather roads or adequate transport (road, rail or waterborne) services by 2030.

Access being defined as ‘living within 2km or 30 minutes walking distance’.

‘All weather’ could be defined as being ‘Constructed to an appropriate engineered standard, passable by the local means of transport for 98% of the year, and with all justifiable routine and periodic maintenance requirements met.’

1. The Technical Support Team (TST) is co-chaired by the Department of Economic and Social Affairs and the United Nations Development Programme. The preparation of this issues brief has been led by UNEP, with contributions from ECE, ESCAP, FAO, WFP, and WMO. [↑](#footnote-ref-1)