

Analysis of the transport relevance of each of the 17 SDGs

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The Technical Working Group on Transport (TWG) has prepared this paper at the request of the Secretary General's High-Level Advisory Group on Transport. The paper presents an analysis of the transport relevance of each of the 17 proposed Sustainable Development Goals and seeks to inform the deliberations of the HLAG on transport towards articulating a global vision for sustainable transport and the key strategies that will need to be implemented in achieving this vision.

Where are we coming from?

In the MDG goal setting exercise, transport was not specifically considered. MDGs have been strongly identified with “basic needs provisioning”, and since transport has often been equated with infrastructure, it was not classifiable as a basic need. In addition, development groups representing transport have not been very influential and were not exerting themselves in the international MDG arena sufficiently.

However, half-way through the 15 year MDG program, transport started to be recognized as an important means of achieving various goals.

What has been achieved so far - fifteen years after the millennium goal setting? The case for transport vis-à-vis the global development agenda has definitely been gaining importance during the last decade. At this point in time, we note that advocacy for sustainable transport is emerging strongly.

The final report of the Open Working Group (OWG) on SDGs, published on 19 July 2015 is acknowledged by many as a breakthrough for the sustainable transport community.

The fact that transport related targets are included in eight out of the seventeen proposed SDGs (Goals 2, 3, 6, 7, 9, 11, 12, 13) illustrates the cross cutting role that transport has in sustainable development (see figure 1).

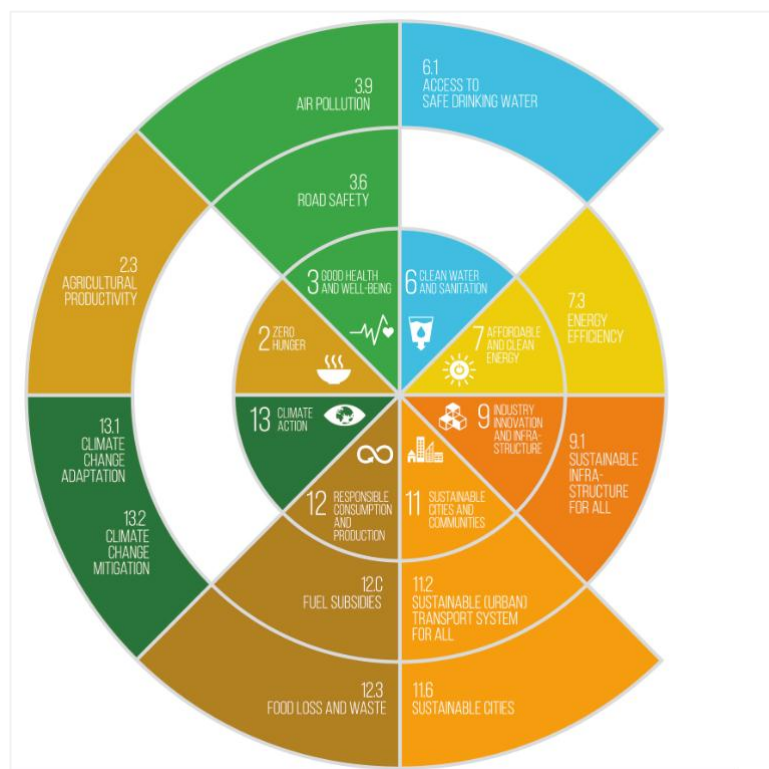


Figure 1: Transport-related SDGs and targets (Source: SIoCaT, 2015)

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The transport relevance of the SDGs and their targets can be direct or indirect (see tables 1+2). Transport stimulates economic and social development, ensures accessibility to opportunities - but is also associated with a number of direct and indirect externalities such as traffic congestion, air pollution and road accidents.

Table 1: Direct Transport Targets of the SDGs

Direct Transport Targets of the Sustainable Development Goals	
3. Ensure healthy lives and promote well-being for all at all ages (<i>Road Safety</i>)	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents
7. Ensure access to affordable, reliable, sustainable and modern energy for all (<i>Energy efficiency</i>)	7.3 By 2030, double the global rate of improvement in energy efficiency
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (<i>Sustainable infrastructure</i>)	9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
11. Make cities and human settlements inclusive, safe, resilient and sustainable (<i>Sustainable (urban) transport for all</i>)	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
12. Ensure sustainable consumption and production patterns (<i>Fuel subsidies</i>)	12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Table 2: Indirect Transport Targets of the SDGs

Indirect Transport Targets of the Sustainable Development Goals	
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture (<i>Agricultural productivity</i>)	2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment
3. Ensure healthy lives and promote well-being for all at all ages (<i>Air pollution</i>)	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
6. Ensure availability and sustainable management of water and sanitation for all (<i>Access to safe drinking water</i>)	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all
11. Make cities and human settlements inclusive, safe, resilient and sustainable (<i>Sustainable cities</i>)	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
12. Ensure sustainable consumption and production patterns (<i>Food loss and waste</i>)	12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
13. Take urgent action to combat climate change and its impacts	13.1 Strengthen resilience and adaptive capacity to climate-

(Climate Change Adaptation & Mitigation)

related hazards and natural disasters in all countries

13.2 integrate climate change measures into national policies, strategies, and planning

Over and above the transport link to specific SDGs and targets, this paper illustrates that transport plays a vital role in contributing to **all** SDGs. It becomes clear that transport has to be understood as means to an end – rather than an end in itself. Transport is not only a matter of developing transport infrastructure and services, but rather the ease of reaching destinations in terms of proximity, convenience and safety.

This paper illustrates the correlation between transport and each of the SDGs and seeks to provide suggestions for transforming the transport sector into a “sustainable” one. Many SDGs are dependent on transport to meet their targets. Transport may not play a major (or obvious) role in a goal - but to achieve the goal and its targets, transport is necessary and acts as a vital “enabler”. It has thus become clear that by ignoring sustainable transport it will be much more difficult to achieve most of the proposed goals.

Goal 1 - End poverty in all its forms everywhere

- ***Target 1.1 - by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day – Transport is inextricably linked to socio-economic development***
- ***Target 1.2 - by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions – Transport offers the means for all to reach ameliorative opportunities while providing job opportunities***
- ***Target 1.4 - by 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance Transport provides accessibility while ensuring inclusiveness and social equality - with the cost of transport being the determining factor***
- ***Target 1.5 - by 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters – Transport as a major contributor to climate change; Resilient transport systems are key to pre- and post-disaster management***
- ***Target 1.b - create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions – Transport Planning and Design that maximizes the benefits of improved mobility and inclusive growth for all***

Transport is a necessary pre-requisite that enables inclusive economic growth, poverty reduction, social progress and an overall improved quality of life. For instance, in Ethiopia, access to all-weather roads in 15 villages has helped to reduce the incidence of poverty by 6.7%.¹

¹ http://siteresources.worldbank.org/INTWDRS/Resources/477365-1327599046334/WDR_00_book.pdf

Transport reduces absolute poverty through economic efficiency – by lowering costs and enhancing opportunities². Growth in goods transport and GDP are strongly co-related.

Investing in efficient and clean transport infrastructure and services (passenger and freight) is key to achieving sustainable economic growth, improving access to services and markets, and enhancing social well-being of communities, building productive capacity, as well as promoting trade and regional and global integration.

According to the World Bank (2015)³ however, adequate transport is unavailable for the world's poorest and most vulnerable people. Even though global transport investments are estimated at between US\$1-\$2 trillion per year, less than 40 percent is in developing countries, home to more than 80 percent of the world's population.

Affordable transport solutions are key for the poor to access opportunities and generate savings. For example, in Nairobi, Kenya the urban poor spend up to 30% of their household income on transport⁴.

The death or severe injury of a family member in a road crash can plunge a family into poverty for generations. The financial impact of losing the income earner - or family members adjusting their own working and educational pursuits to care for the family or injured family member - is significant.

Transport is a major contributor to climate change and sustainable solutions can reduce exposure to and the vulnerability of the poor to climate-related extreme events - thus contributing to target 1.5. Resilient transportation systems also play a crucial role before, during and after a disaster.

The transport sector can be an important source of stable and quality employment. For instance, BRT systems can provide formal employment for workers who were earlier engaged in informal transport operations.

Improvements in road safety generates employment as low-cost simple treatments can be implemented by local communities and small businesses. Such investments can be country-wide and create opportunities and long-term benefits for low-income communities.

Goal 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture

- *Target 2.1 - by 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round – Reliable transport ensures market accessibility for producers and consumers*
- *Target 2.2 - by 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and*

² <http://siteresources.worldbank.org/INTURBANTRANSPORT/Resources/twu-30.pdf>

³ <http://www.worldbank.org/en/news/feature/2015/07/31/a-global-opportunity-for-sustainable-transport>

⁴ UN-Habitat/ODI (2014): Poverty and sustainable transport: How transport affects poor people with policy implications for poverty reduction. A literature review. (page 42)

address the nutritional needs of adolescent girls, pregnant and lactating women and older persons – Transport and agricultural logistic chains ensure access to nutritious and affordable food options for all

- *Target 2.3 - by 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment – Logistic chains impact on agricultural productivity, market accessibility and farmers' income through time, energy and cost savings*
- *Target 2a - increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries - Outreach of agricultural extension, technology and knowledge depending on availability of reliable transport options*

The correlation between transport and food security is particularly visible in the context of rural accessibility⁵. Small-scale farmers with meager quantities of surplus food often struggle to pay for the transport of their goods to the market (“stranded” harvests). In achieving target 2.3, transport infrastructure improvements, efficient logistical chains and affordable transport options as alternatives to head and back-loading – all impact on agricultural productivity and farmers’ income through time, energy and cost savings. Strong attention to “food-transit connections” is furthermore vital to keep consumer prices affordable. Logistics improvements can also be effective in the management of food price risks, shocks and instabilities. Improved access in remote areas will additionally increase the outreach of extension workers (target 2a).

Opportunities can arise for small-scale cooperative transportation ventures, local production and consumption chains, the development of mobile “farmers” markets and the increased use of Information and Communication Technologies (ICT) in agricultural transport and value chains.

Road construction and suburban sprawl contribute to the loss of prime farmland near cities – and food supplies have to come from increasingly distant locations. There is need for an integrated development of peri-urban and intra-urban food transport.

“Landlockedness” and dependence on lengthy road and rail routes for international trade impacts on the cost of food imports in many countries.

Poor road conditions, unreliability of the road networks, traffic congestion and road crashes cause delays resulting in spoilage of agricultural products. Improving the road infrastructure can reduce and minimize these negative impacts and help to achieve targets 2.1 and 2.2.

Improvements in transportation and a decrease in travel costs contribute to a household’s savings - and therefore to its food security.

GHG emissions and air pollution from transport can affect crop yield and contribute to climate change resulting in extreme events such as floods or droughts – impacting on food security.

⁵ UN-Habitat/ODI (2014): Poverty and sustainable transport: How transport affects poor people with policy implications for poverty reduction. A literature review. (page 17-26)

During disasters a reliable transport infrastructure is a major (and life-saving) component of emergency preparedness - as a carrier of relief and food supplies.

In a city context, sustainable transport solutions ensure access to urban markets. However poor families lacking adequate food and transport budget tend to shop for cheap, often nutrient-deficient foods in nearby stores and might have limited access to a broad variety of food⁶.

The rapid growth in biofuel production can affect food security through its impact on food prices and income.

Goal 3 – Ensure healthy lives and promote well-being for all at all ages

- *Target 3.4 – by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment, and promote mental health and wellbeing – Exposure to air pollution is one of the main risk factors for non-communicable diseases*
- *Target 3.6 – by 2020 halve global deaths and injuries from road traffic accidents – Annually, an estimated 1.24 million people are killed in road traffic accidents. For every fatality, 10 people are seriously injured.*
- *Target 3.9 – by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution contamination – Outdoor air pollution causes the premature deaths of an estimated 3.7 million people – close to 90% in developing countries.*

The transport sector is a major source of air pollution in cities and often the largest source of small particulate matter (PM) and NO_x emissions that drastically affect public health. Other air pollutants emitted by transport sector and affect public health includes, lead (Pb), carbon monoxide, benzene and volatile components (BTX), and heavy metals. There are many transport policies that can help achieve Targets 3.4 and 3.9. Some of the main policies that can reduce air pollution by up to 95% include (re)designing cities such that active and public transport is the main mode of transport; and providing cleaner fuels and implementing vehicle emission standards for light-duty and heavy-duty vehicles.

Out of the 1.24 million people killed annually from road traffic accidents, 92% occur in low- and middle- income countries. Young adults and therefore income earners form the majority of victims – while vulnerable road users such as pedestrians and cyclists are at highest risk of fatality. Well-planned, integrated, transport networks have the potential to increase road safety, e.g. through people-centered planning or pedestrian-oriented development patterns. Other policies that can help achieve this target are the strict implementation of speed limits particularly in urban areas and traffic calming measures like speed tables. In developing countries, capacity building efforts on road engineering and traffic policies and implementation is a critical element in achieving this target.

⁶ http://www.ers.usda.gov/media/242675/ap036_1_.pdf

Other health-related benefits of sustainable transport solutions are in regard to active mobility such as walking and cycling, noise reduction, as well as personal inviolacy and safety from crime. Affordable, reliable and efficient transportation is furthermore a vital pre-condition for accessing health care, especially in remote areas.

Goal 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

- *Target 4.2 - by 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education - availability, affordability and reliability of transport determine access to educational facilities*
- *Target 4.3 - by 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university - availability, affordability and reliability of transport determine access to educational facilities*
- *Target 4.4 - by 2030, increase by [x] per cent the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship - transport sector as a source of learning, research and innovation*
- *Target 4.5 - by 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations - equal access to transport promotes equitable access to educational opportunities*

Reliable, less cumbersome (in terms of physical effort), low-cost transport can positively contribute to access to formal education and the achievement of targets 4.2 and 4.3, with impacts on subsequent livelihood opportunities.

The provision of equal access to safe and reliable transport can promote equality and equitable educational opportunities for all. In many parts of the world, pro-male school enrolment still prevails. Actions have to be designed for increased accessibility of education facilities for female students – to achieve target 4.5.

Children's widespread role as transporters (e.g. head loaders for water supply) may constrain their access to education due to reduced time available to attend school⁷. Improved goods transport options (including water) can enhance education opportunities – particularly for girls. The availability of safe, affordable and accessible transport options promotes access to education for people with disabilities.

Human resources are crucial for an efficient and high-quality transport system and transport as an economic sector offers a wide variety of jobs with different skills requirements. The education sector can respond by fostering innovation and learning on transport and support target 4.4.

Goal 5 - Achieve gender equality and empower all women and girls

⁷ <https://www.dur.ac.uk/child.mobility/previousproject/>

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- **Target 5.2 - eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation – safe transport options and preventive measures enhance personal security of women and girls**
- **Target 5.4 - recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate - transport options to be responsive to specific mobility needs of women**
- **Target 5.5 - ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life - transport enables women to participate in public life, politics and social interaction; transport sector offers employment**
- **Target 5.6 - ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences – transport enables women to access health services**

Transport is a key enabler for women to access opportunities such as health services, education facilities, jobs or for participation in politics and social activities. Hence, safe, reliable and sustainable transport interventions can make a big difference in increasing women's education, productivity, health and promote gender equality - hence illustrating a strategy to achieve targets 5.5 and 5.6.

Basic mobility needs of women and men are different and grounded on the gender-based division of labor within the family and community. It is therefore essential to integrate women into research, planning, decision-making and policy formulation of any transport interventions.

Particularly in rural areas, women's time burden is affected by inadequate transport systems. Studies on rural transport showed the plight of rural dwellers, especially women, who spent substantial time and energy on transport activities, to the detriment of their development potential.⁸ Improved management and finance of rural transport infrastructure, as well as services through both motorized and non-motorized means of transport have thus great potential to achieve target 5.4.

Actions should be taken to increase the proportion of female employees in the transportation sector, which is traditionally a male-dominated field. Women may have less access to funds and means of personal transport and rely more on public transport and NMT. The promotion of these modes can therefore empower women.

Ensuring personal safety and security in regard of transportation is one major step towards gender equality. Women – often relying on public transport or walking – are particularly vulnerable in terms of crime, e.g. sexual harassment or theft. Taking action towards improved safety of women, and ensuring crime and violence free mobility, can contribute to target 5.2.

⁸<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/0..contentMDK:20264536~menuPK:535738~pagePK:146736~piPK:226340~theSitePK:258644.00.html#Recentdevelopments>

Goal 6 - Ensure availability and sustainable management of water and sanitation for all

- *Target 6.1 - by 2030, achieve universal and equitable access to safe and affordable drinking water for all - transport ensures physical access to water; transport emissions can impact on fresh water sources*
- *Target 6.2 - by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations - transport ensures physical access to sanitation*
- *Target 6.3 - by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse by [x] per cent globally - transport emissions, transport-related waste or infrastructure works can impact on water quality*
- *Target 6.6 - by 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes - transport infrastructure and emissions impact on ecosystems*

Against the background of targets 6.1 and 6.2, reliable, low-cost and efficient transport infrastructure and services can improve physical access to water and sanitation facilities - particularly in rural areas. Transport helps to reduce the burden of accessing water supply and sanitation services in these areas – particularly for women and girls. Safe transportation (e.g. well-lit streets) can furthermore enhance women’s access to water and sanitation facilities.

From an environmental perspective, transport emissions and transport-related waste can result in water contamination through metals and minerals – impacting on water quality and availability. A range of emissions of substances caused by transport may reach soils, sediments from drainage systems, or surface waters via both water and air, some of these may partly reach groundwater. Transport installations and facilities, such as petrol stations or airfields, may be substantial point sources of groundwater pollution⁹. Waste and ballast water release from inland shipping impacts on the water quality of inland fresh-water sources. Water contamination can also be sparked by waterborne transport of dangerous goods incl. chemicals, oil and other hazardous products.

Safe, sustainable transport systems can contribute to fewer and less damaging contamination events or accidents involving the transport of goods by sea or inland waterways, thus contributing to targets 6.1 and 6.3.

From an infrastructure point of view, transport can destroy water-related ecosystems. Adequate assessment measures have to be put in place to achieve target 6.6.

Transportation and utility facilities (water, sanitary and storm sewer lines, water pipes) often share the same corridors - offering potential for economies of scale.

Goal 7 – Ensure access to affordable, reliable, sustainable, and modern energy for all

⁹ http://www.who.int/water_sanitation_health/resourcesquality/en/groundwater13.pdf

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- **Target 7.1 – by 2030 ensure universal access to affordable, reliable, and modern energy services** – The transport sector places large demand on fossil fuels and need for accessing cleaner energy sources for transport critical in achieving this target.
- **Target 7.3 – double the global rate of improvement in energy efficiency by 2030** – Improving vehicle fuel efficiency can reduce (avoid) about 1 GT CO₂ emissions by 2030 per year and 2 GT per year by 2050

Transportation accounts for approximately 25% of the world's energy demand and for about 61.5% of all the oil used each year. Motorization is still in a high trajectory in developing countries, where private car use for daily travel is the main mode of transport, causing major vehicle traffic, increasing fuel use and emissions. By 2030, many developing countries will have higher GDP per capita, and several will have doubled their vehicle fleet. In order to achieve Goal 7, economic development will have to be de-coupled from energy use and emissions. There are various types of actions that can be taken to improve the efficiency of transport fuel use, like improving road conditions, providing high quality fuels, promoting eco-driving, better vehicle technologies including promoting electric vehicles, and over-all improvement of urban transport systems. For example, providing innovative solar power generating facilities and charging stations for electric 2-wheelers can provide a sustainable transport option in urban and rural areas, especially where access to electricity.

In order to achieve target 7.3, improving vehicle fuel efficiency of vehicles will be key as motorization in developing countries is still high. Implementing fuel economy standards, vehicle labeling, and fiscal policies including feebates and taxation-based on vehicle efficiency are examples of policies to achieve this target.

Goal 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

- **Target 8.2 - achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value-added and labour-intensive sectors** - Efficient transport and logistics are fundamental for economic productivity
- **Target 8.4 - improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead** - Sustainable transport fosters green growth following a low-carbon development pathway
- **Target 8.5 - by 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value** - transport is a major employment sector offering a diversity of jobs
- **Target 8.a - Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries** - Transport ensures the movement of goods within countries and across international borders

Quality and cost of transport have a major impact on economic growth, on the ability of businesses to compete, on the movement of freight and on personal productivity. Efficient transport (transport

activity, logistics chain, reduction of trade barriers) is fundamental for a more efficient economy particularly for developing countries –hence representing a critical element in achieving target 8.2.

Improved public and non-motorized transport options and travel demand management/pricing mechanisms help to manage congestion and increase economic growth in city contexts. Traffic congestion imposes a heavy burden on the economy due to time wasted in slow traffic, fuel wastage and increased emissions (up to 10 % in Lima, Peru)¹⁰.

In order to achieve target 8.5, transport plays a critical role as a major employment sector that offers a diversity of jobs. In Europe, for instance, the transport industry directly employs more than 10 million people, accounting for 4.5% of total employment. Manufacture of transport equipment provides an additional 1.5% employment¹¹. The African example illustrates that every direct job in the transport service sector usually results in 2 to 2.5 indirect jobs in other sectors.¹²

Sustainable and innovative transport solutions can foster green growth and employment opportunities while following a low carbon pathway decoupled from emissions.

Substantial multiplier effects are associated with the transport sector, e.g. increased public transport investments foster development in many other sectors.¹³

Investment in safer road infrastructure can provide significant country-wide economic activity. A global investment of \$681 billion of safer road upgrades would deliver \$5,715 billion of economic benefit and save an estimated 40,000,000 deaths and serious injuries over 20 years.¹⁴

Goal 9 - Resilient Infrastructure, sustainable industrialization and innovation

- *Target 9.1 - develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all – resilient transport infrastructure is a key element for socio-economic development, robust supply chains and goods movement*
- *Target 9.4 - by 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities – Transport industry can enormously contribute to low carbon development*
- *Target 9.5 - Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and increasing the number of research and development workers per 1 million people by [x] per cent and public and private research and development spending – Transport as a major industry facilitating innovations such as ITS*
- *Target 9.a - Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States -*

¹⁰ Draft Issue Paper on Transport (Habitat III)

¹¹ http://ec.europa.eu/transport/strategies/facts-and-figures/transport-matters/index_en.htm

¹² UN-Habitat (2013): Sustainable Mobility in African cities. (page 20)

¹³ <https://www.apta.com/resources/reportsandpublications/Documents/Economic-Impact-Public-Transportation-Investment-APTA.pdf>

¹⁴ <http://www.irap.org/en/about-irap-2/a-business-case-for-safer-roads>

Enabling frameworks for integrated and innovative transport infrastructure resilience and adaptation action on national and local level

In order to achieve sustainable industrialization, trans-border connections and transport development corridors for spatial inclusion of and connectivity between economic hubs play a crucial role. A robust and resilient transportation infrastructure is an essential element for a resilient supply chain as disruption to the global, interregional, national and local trade lanes could impact development, as transport costs could be increased and delivery of products delayed.

Reliable transport can enhance social and economic resilience as well as meeting security and emergency response needs. Serious disruption to transportation infrastructure can have catastrophic impacts on the ability of the community, business and economy to prepare and recover from a disaster. The importance of transportation networks in pre- and post-disaster evacuation becomes obvious and might be of life-saving nature.

Transportation infrastructure has to be made efficient, equitable and resilient. The example of hurricane Katrina illustrates that Katrina's evacuation plan functioned relatively well for motorists but failed to serve people who depend on public transit¹⁵. It has to be noted that public transport (i.e. buses) has the potential to evacuate a city much faster than private transport.

A wide-range of innovative technologies are generated within the transport sector. Companies active in the development of IT solutions for transportation show a very high R&D (research and development) intensity. A major investment opportunity exists for telematics, traffic demand management and Intelligent Transportation Systems (ITS) can enhance the operational efficiency of the entire transport sector and reduce energy consumption of all forms of motorized transport. Innovation is a key selling factor particularly in the automotive and aviation industries.

Goal 10 – Reduce inequality within and among countries

- **Target 10.1 - By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average – Transport can provide affordable access to jobs, markets, schools and essential services**
- **Target 10.2 - By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status – Full inclusion requires large improvement in rural and urban transport infrastructure and services to provide access to hundreds of millions that currently lack access**

Economic growth and social development is highly related to improved access of people and goods (through transport) to the core economies and other opportunities. Sustainable transportation can enhance accessibility if the planning is based on the principles of inclusion and equality. Inadequate transport remains a key reason for the persistence of poverty and inequality among

¹⁵ <http://www.vtpi.org/katrina.pdf>

countries, regions and cities. Particularly the poor and most vulnerable are disproportionately impacted by the transport systems with poor road and public transport options and unsafe vehicles, along with poor infrastructure provision for pedestrian, cyclist and motorcyclist journeys.¹⁶ This also impacts access to markets, services and opportunities further entrenching inequality.

Goal 11 – Make cities and human settlements inclusive, safe, resilient and sustainable

- *Target 11.1 - by 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums – Transport can ensure access to basic services, destinations, goods and wider opportunities*
- *Target 11.2 - by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons – Transport systems form important public assets*
- *Target 11.3 - by 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries – The practice of transport planning – as well as the integration of sectorial policies – determines the level of urban sustainability*
- *Target 11.6 - by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management – Transport as a key contributor to outdoor air pollution that causes the premature deaths of an estimated 3.7 million people.*
- *Target 11.a - support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning - Intra-city and inter-regional transport planning and management link urban areas to their surrounding*
- *Target 11.b - by 2020, increase by [x] per cent the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, develop and implement, in line with the forthcoming Hyogo Framework, holistic disaster risk management at all levels – Integrated transport policies and plans determine the efficiency, effectiveness, inclusiveness and resilience of transportation systems.*

Transport ensures access to services, goods and opportunities. Compact city planning can reduce the need to travel. When combined with an inclusive and efficient public transport system including more attractive and safer options for active mobility, namely walking and cycling, integrated land-use and transport planning can improve accessibility and contribute to environmental sustainability. Affordability of transport for the urban poor and accessibility of all, including for people with disabilities, women, the elderly and other vulnerable groups are essential for the city to be inclusive. Women are known to have experienced violence and harassment while moving around in cities. Their travel needs are also different from those of men. To make cities more inclusive, women need to be involved more in the planning and implementation of transport interventions.

¹⁶ <http://www.irap.org>

Innovations in ICT can promote sustainable urban mobility. For example ICT systems for road and congestion pricing can influence travel behavior and encourage use of public transport, walking and cycling as opposed to car-dependence.

Improvements in vehicle technologies and fuel efficiency are essential for reducing pollution and GHG emissions. Mechanisms for Intra-city and inter-regional transport planning and management are important for the safe and efficient movement of people and goods. Establishing Metropolitan Transport Authorities with jurisdiction over all transport and mobility issues in large metropolitan areas and supportive national urban and transport policies are necessary. Freight transport in urban areas has not received adequate attention but has major implications for fuel consumption, congestion, pollution and road safety. This area requires more research and sharing of good practices.

Transport infrastructure also needs to be resilient to hazards such as earthquakes and extreme weather events including floods, landslides and high temperatures. The role of transport infrastructure in ensuring supply of relief materials during disasters is also vital.

Goal 12 – Ensure sustainable consumption and production patterns

- *Target 12.1 - Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries – Applying the principles of sustainable consumption and production; moving from private to collective forms of transport lowers resource consumption while improving access.*
- *Target 12.3 - By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses – Improving rural transport infrastructure and services is key to reduce food waste and losses*
- *Target 12.4 - By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment - Combustion of oil in transport is currently one of the main sources of air pollution*
- *Target 12.c - Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities - Reduction of fuel subsidies go hand in hand with the scaling up of sustainable transport*

Applying green technologies and processes in transport and logistics will be a crucial component of comprehensive strategies towards more sustainable ways of consumption and production of goods and services in the entire economy.

The shortage of reliable rural transport services has been quoted repeatedly as being responsible for food crops not reaching the market at all and holding back farmers to expand food production for the market. In other cases the poor quality of transport services accounts for waste happening during transport to the market.

As pointed out elsewhere in this document transport contributes significantly to air pollution.

Those countries that have large fuel subsidies encourage driving, countries with fuel subsidies have higher numbers of road fatalities, more air pollution on a per vehicle basis and greater GHG emissions for the transport sector. At the same time the hundreds of billions of dollars being wasted on fuel subsidies are no longer available to support the implementation of social, economic and environmental programs including the scaling up of sustainable, low carbon transport.

Goal 13 – Take urgent action to combat climate change and its impacts

- *Target 13.2 – Integrate climate change measures into policies, strategies and planning – In 2010, the transport sector was responsible for approximately 23% of total energy-related CO2 emissions.*

Sustainable transport solutions offer significant mitigation potential and are essential in meeting the 2 degree Celsius goal to minimize the impacts of climate change. GHG emissions from the transport sector have more than double since 1970 – increasing at faster rate than any other energy end-use sector. Some transport-related gases also deplete the stratospheric ozone (O3) layer which naturally screens the earth's surface from ultraviolet radiation. Short-lived climate forcers, particularly Black Carbon from diesel vehicle emissions also impact climate change in addition to increasing risk for premature deaths.

In order to achieve this target, comprehensive sustainable transport solutions have to be pursued, including integration of land-use and transport planning, prioritization of public transport, non-motorized transport/ active transport, electric vehicles, cleaner and more efficient internal combustion engine vehicles (policies for advanced vehicle technologies, emission standards, and cleaner fuels). In addition, greening of vehicle manufacturing and infrastructure construction can help to reduce GHG emissions from the transport industry.

Actions also have to be prioritized towards adaptation or enhancing the resilience of transport infrastructure and services. Resilient infrastructure and services can combat the impacts of climate change, including preparedness, protection, response, and recovery. There are also adverse impacts of climate change on transport infrastructure, e.g. extreme heat cracking roads and twisting train rails, or roads being washed away by extreme weather events. Against these new experiences, road engineering, road materials, and train rails have to be adapted to address these issues.

Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development

- *Target 14.1 - By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution – Maritime transport, essential for trade, can have a negative impact on marine environment*

Maritime transport is the backbone of international trade and the global economy. According to UNCTAD, around 80% of the global trade by volume and over 70% of the global trade by value are carried by sea and being handled by ports worldwide. These shares are even higher in the case of most developing countries. Although entirely necessary for the efficient functioning of the world's economy, these transport activities are a source of pollution. Ballast water discharges, wildlife collisions, marine debris or oil spills negatively affect the environment and human health. There is need for sustainable solutions, global regulations, implementation and enforceability of measures.

In-land and coastal shipping have a key role in economic development facilitating passenger and freight movements; and can facilitate or hinder use of oceans, seas and marine resources.

Goal 15 –Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

- *Target 15.1 - By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements – Transport is an important enabler of degradation of terrestrial ecosystems, forests, deserts, land and biodiversity*

Road and rail expansion and construction have a severe impact on the landscape, and can result in the destruction of the surrounding ecosystems and interactions, in land take or land degradation.

The need for construction materials and the development of land-based transportation has led to deforestation, degradation of wet lands and reduction in biodiversity. New plant species have been introduced along transport corridors, while many animal species are becoming extinct as a result of changes in their natural habitats and reduction of spatial movement. Well-planned infrastructure and corridors for NMT or collective means of transport can reduce negative impacts as well as the infrastructure footprint.

Environmental Impact Assessments and wider range of options during infrastructure planning are essential for minimizing these negative externalities in order to achieve target 15.1.

Goal 16 –Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

- **Target 16.3 - Promote the rule of law at the national and international levels and ensure equal access to justice for all – Transport is a key ingredient to rehabilitate post-conflict areas**

Transport as an enabler of economic growth, regional cooperation and economic integration – also across jurisdictional borders – can help to increase economic equality and thus political stability. International transport corridors play an important role. Border zones are a common conflict trigger. Hence, cross-border collaborative trade and transport solutions are required such as alignment of toll charges, border control procedures or harmonized security measures for transport operations.

Transport is essential for stabilization missions in the quest to access and rebuild post-conflict states. Peace-building missions are often reliant on transportation systems for supply of lifesaving materials and activities. The rehabilitation of transport infrastructure can contribute to poverty reduction, economic growth and inclusive social development.

On the other hand, transport corridors can facilitate insecurity and the activities of insurgents.

Goal 17 –Strengthen the means of implementation and revitalize the global partnership for sustainable development

Finance

- **Target 17.3 - mobilize additional financial resources for developing countries from multiple sources – There are multiple options to increase funding for sustainable transport from ODA, Climate Finance and Private Sector**

Technology

- **Target 17.6 - enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism – There is a growing number of global initiatives that work on international cooperation on sustainable transport.**

Capacity-building

- **Target - 17.9 - enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation – The scaling up of sustainable transport can be enabled through an expansion of existing capacity building programs**

Trade

- **17.11 - significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020 – Well functioning**

cross border transport systems is a precondition to improve trade, especially in land-locked countries.

Systemic issues

Policy and institutional coherence

- **Target 17.14 - enhance policy coherence for sustainable development** – There are strong inter-linkages between sustainable development and climate change policies in the case of the transport sector.

Multi-stakeholder partnerships

- **Target 17.17 - encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships** - There are a growing number of multi-stakeholder partnerships on sustainable transport

Data, monitoring and accountability

- **Target 17.19 - by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries** – There is a great need to improve data collection, analysis, management and dissemination for transport.

Future actions as part of the Sustainable Transport Agenda (as stated in the introduction of this paper), will depend on the formulation of strong and action-oriented means of implementation. There is need for translating transport policy recommendation into action plans. Strong local and national institutions and other developmental partners should be responsible for local action and implementation - which is key to enhancing progress towards sustainable development globally.

Collaborative action towards the envisaged common sustainable transport development objectives on global level have to be enhanced. Various global partnerships have already been developed in the sustainable transport arena:

- **Secretary-General's High-Level Advisory Group on Sustainable Transport:** In 2014, UN SG Ban Ki-moon announced the membership of a High-level Advisory Group on Sustainable Transport to provide recommendations on sustainable transport actionable at global, national, local and sector levels; 3 years term; identification for practical ways to unlock the potential of sustainable transport to contribute to poverty alleviation, sustainable growth and sustainable urbanization;
- **The Partnership on Sustainable, Low Carbon Transport (SLoCaT)¹⁷:** SLoCaT promotes the integration on sustainable transport in global policies on sustainable development and climate change. SLoCaT consists of a multi-stakeholder partnership of over 90 organizations, which is supported by the SLoCaT Foundation.
- **Rio+20 Voluntary Commitments on Sustainable Transport¹⁸:** At the Rio+20 Conference, [17 Voluntary Commitments](#) were made to contribute to the promotion and implementation of

¹⁷ <http://www.slocat.net/about-slocat>

¹⁸ <http://slocat.net/rio20-VC>

sustainable transport and sustainable development. In 2013, six additional commitments were made for the coming decade. These additional commitments will help to track the sustainability of the transport sector and also contribute towards reporting on the implementation and impact of the existing Voluntary Commitments on Sustainable Transport;

- *Global Partnership for Sustainable Transport*¹⁹: bringing together a large number and a great variety of relevant international stakeholders in the field of sustainable transport; private sector led initiative; expected to become an implementation tool for the realisation of the SDGs within the Post 2015 Development Agenda;
- Global Initiatives do exist working towards sustainable and clean transport, such as: the Urban Electric Mobility Initiative²⁰ launched during SG Climate Summit 2014 in New York; the Electric Vehicle Initiative²¹ established in 2010 under the Clean Energy Ministerial, the Zero Emission Vehicle Alliance²² led by California and launched in 2015, the C40 Low Emission Vehicle initiative²³ or the Global Fuel Economy Initiative being a key partner in implementing the G20 Energy Efficiency Action Plan.²⁴

¹⁹ https://www.iru.org/cms-filessystem-action/mix_pdf/vienna.pdf

²⁰ <http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/09/TRANSPORT-Action-Plan-UEMI.pdf>

²¹ <http://www.cleanenergyministerial.org/Our-Work/Initiatives/Electric-Vehicles>

²² <http://www.calepa.ca.gov/pressroom/Releases/2015/EVGlobalTran.htm>

²³ http://www.c40.org/networks/low_emission_vehicles

²⁴ <http://www.unep.org/transport/new/gfei.asp>