1 September 2021

United Nations Sustainable Transport Conference

Second United Nations Global Sustainable Transport Conference

14 - 16 October 2021, Beijing, China

Thematic session 4:
Sustainable transport and green development: climate change mitigation, adaptation and resilience

Concept note

I. Introduction

Sustainable and climate-resilient transport systems are needed to advance green development and meet the shared commitments in the 2030 Agenda for sustainable development, the Paris Agreement on Climate Change and other relevant international agreements, such as the New Urban Agenda. The transport sector is a significant contributor to greenhouse gas (GHG) emissions and climate change, and to air and noise pollution, particularly affecting vulnerable groups, such as the poor, women, children and youth, the elderly, and persons with disabilities. At the same time, transport infrastructure can be particularly vulnerable to the impacts of climate change and extreme weather and disasters, albeit with different levels of risk and exposure across regions and sectors. This can result in costly associated damage, disruption and delay across supply-chains and transport systems with implications for global trade and development. However, there is huge potential in further mobilizing the transport sector for climate action. This session will identify how environmental externalities in the transport sector can be minimized, including in the context of lifecycle management and the post-COVID-19 recovery, to help achieve the SDGs and global climate commitments and advance green development. It will also focus on ways the changing climate is affecting transport systems, while considering measures for climate change adaptation, mitigation, and resilience-building across all modes of transport. Finally, the session will provide positive examples of how the transport sector has contributed to climate action, including through efficiency measures, e-mobility, and integrated multi-modal transport systems (freight and passenger), and elaborate on how such initiatives might be scaled up.

II. Stocktaking

The Paris Agreement adopted under the United Nations Framework Convention on Climate Change, discusses the critical role of transport in achieving the desired 1.5 degree scenario and emphasizes the mitigation potential of the transport sector. According to an analysis by SLoCaT[1] (Partnership on Sustainable, Low Carbon Transport), of the 166 NDC submissions representing 193 countries, 76 per cent highlighted the transport sector as a mitigation source, but only 8 per cent included transport specific GHG mitigation targets. This is a clear indication that countries will have to increase their ambition towards sustainable mobility with measurable targets going forward in developing the next generation of NDCs. Action is important because globally transport accounted for about 64 per cent of total oil consumption, 27 per cent of all energy use, approximately a quarter of energy-related CO2 emissions and 14 per cent of overall emissions with over eight billion tons of CO2 emitted

in 2017. These emissions reflect a 71 per cent increase over 1990 levels. Levels and growth rates of GHG emissions from transport vary across regions and modes of transport. Emissions are highest in developed countries, but the fastest recent growth in transport emissions is in developing countries as a result of pre-pandemic GDP growth coupled with increases in passenger and freight transport activity.

Within the transport sector, passenger emissions from road transport are the most significant. Approximately 80 per cent of the increase in transport related emissions since 1970 has come from road vehicles, including cars, trucks, buses and two- and three-wheelers. Emissions from aviation and shipping have recently been increasing at a faster rate than for any other transport mode. Domestic and international aviation and shipping account for approximately 2 and 2.9 per cent of global CO_2 emissions produced by human activity, respectively. Recent research from IMO indicates that shipping emissions are decoupling from increasing sea trade volumes. One of the most energy-efficient transport modes is rail, which in 2019 was only responsible for about 0.3 per cent of direct CO_2 emissions. Emissions from freight transport have been increasing from 35 per cent of transport related emissions in 2000 to 41 per cent in 2015. Considering that transport volumes (both passenger and freight) are projected to increase significantly by 2050, deep reductions in emissions will be required to steer the transport sector toward its sustainable future. The COVID-19 crisis caused, as during earlier crises marked by global economic slowdowns, a short-term reduction in emissions of GHGs and other pollutants but by the end of the year GHG emissions were roaring back – globally, energy-related emissions fell by about 6 percent but were already higher in December 2020 than the same period in 2019. Long-term impacts remain to be seen and the continuous involvement of the transport sector in climate action will be crucial.

Transport emissions contribute to climate change, but transport systems are also highly vulnerable to the impacts of climate change as well as extreme weather and natural disasters, such as accelerated mean and extreme sea-level rise, extreme precipitation, riverine flooding, flash floods and heat waves, which can, among others, result in access restrictions to docks and marinas, deterioration of the condition and structural integrity of road pavements, bridges, airports, and railway tracks. The global expected annual damages due to direct damage to road and railway assets, for example, are estimated to range from 3.1 to 22 billion US dollars, of which around 73 per cent is caused by surface and river flooding. Another recent study estimates that the total value of assets exposed to episodic coastal flooding by 2100 could increase to 12 – 20 per cent of global GDP, if no adaptation measures are taken. In addition to direct damage, operational disruptions and delays across supply-chains may give rise to extensive economic losses, with implications for global trade and development. Developing countries with low adaptive capacity, such as countries in special situations, are particularly affected as they depend on critical transport infrastructure for external trade, food and energy security, as well as tourism.

GHG emissions are not the only environmental externality generated by transport systems. Air, (inland and marine) water, and noise pollution are problematic as well and land use changes for transport infrastructure can damage critical ecosystems. Today, over 90 per cent of the global population live in areas where air quality exceeds WHO guideline limits, leading to 4.2 million avoidable deaths each year due to ambient air pollution alone. Together, PM2.5 and ozone concentrations from transportation emissions resulted in 7.8 million years of life lost and approximately $1 trillion (2015 US$) in health damages globally in 2015. Noise

pollution from transport sources also has negative societal impacts. For instance, at least 100 million people are affected by road traffic noise in the European Union alone.

There are however also reasons to believe that we may be on the verge of some positive, long-lasting changes. In 2021, a growing number of countries have accelerated their commitments towards carbon neutrality and the European Union adopted the European Green Deal. Cities, states, and businesses, including some car manufacturers, have also taken the lead in making voluntary zero emissions commitments.

III. Proposals for advancing progress in the context of SDG Acceleration and Climate Action

Sustainable freight and passenger transport in support of the 2030 Agenda and the Paris Agreement will require a coordinated effort from the entire transport community and across all levels. Going forward, the following selected points to advance progress could be considered:

Avoid-Shift-Improve approach – The goal of this approach is to *avoid* passenger trips and freight movement where possible; and to reduce travel distance by motorized transport modes, including by using sustainable urban planning and design (e.g., 15-minute city concept). For example, multimodal transport systems should be part of sustainable transport solutions with a focus on enhancing the use of public transport and vehicle sharing services with last-mile connectivity with non-motorized transport, moving away from individual vehicles and the traditional one person/one vehicle model, as well as incentivizing and facilitating the switch to rail and intermodal transport solutions for freight. It also aims to *shift* passenger and freight transport to more environmentally friendly modes; foster walking and cycling, as the cheapest and most readily available modes of zero-carbon transport and expand clean public and freight transport. Finally, its goal is to *improve* transport systems, for example, by using below-mentioned technological approaches and other measures. An important related aspect will be to generate changes in trade/supply chain patterns, service provision and individual and collective behavior towards sustainable transport.

Innovative technologies to increase efficiency - Intelligent transport systems (ITS), autonomous vehicles, and new environmentally friendly fuels and power supplies are expected to become central features of the transport innovation landscape which should be further supported and explored. The global ITS market size was an estimated US$32 billion in 2019 and is growing rapidly. However, ITS development and operation in many parts of the world has been fragmented, mono-modal and geographically limited especially in regions with financial and capacity constraints. More can be done to promote ITS, particularly in densely populated urban areas where comparatively small investments (relative to overall transport infrastructure investments) have the potential for enormous socio-economic payoffs.

Electrification of vehicles - In order to limit the average global temperature increase to under 1.5°C above pre-industrial levels, the Intergovernmental Panel on Climate Change (IPCC) reported in 2018 that electric vehicles, electric bikes and electric transit need to displace fossil-fuel powered passenger vehicles by 2035-2050. The current rapid development of electric vehicles in some countries will, among others, depend on the set-up of adequate infrastructure and may bring along a range of unintended harmful environmental effects (e.g., mining, used vehicle trade, improper battery disposal) if not implemented sustainably. Adequate policies and regulations need therefore to be put in place together with incentives to use electric vehicles, especially for public and shared vehicles, and plans to make electric

vehicles available to all. Policy integration with related sectors, such as the energy sector, is also critical for advancing decarbonization of electricity that supports charging infrastructures for EVs.

Alternative fuels - For some heavy-duty vehicles such as large sea-going ships or aircrafts, fleet electrification may take longer or even not be feasible, and the uptake of alternative low-carbon and zero-carbon fuels will be integral to achieve deep decarbonization of these sectors. Policies are being put into place to reduce transport-related emissions. For example, in 2010 the ICAO Assembly adopted aspirational goals for the international aviation sector of 2 per cent annual fuel efficiency improvements toward carbon neutral growth from 2020 onwards with sustainable aviation fuels playing a key role in achieving such sectoral goals. As another example, the vision adopted in 2018 by IMO towards phasing out GHG emissions from international shipping as soon as possible in this century requires a massive uptake of low-carbon and zero-carbon fuels for shipping. Across sectors, international collaboration is necessary to develop the global markets, standards and necessary infrastructure required for deployment of alternative fuels in line with net-zero emissions by 2050.

Public transport and non-motorized modes – Shifting toward public transport as well as non-motorized modes, such as walking and cycling, should be encouraged by providing bike lanes and safe pedestrian routes and by making public transport more efficient, affordable, accessible, and safe for users, especially vulnerable groups. Their usage can also be encouraged by introducing transport demand measures, including parking fees or congestion charging, and by undertaking awareness raising and education efforts. Establishing these modes can create green jobs and they provide many health benefits, for example, by reducing air and noise pollution and road traffic injuries as well as diseases/fatalities linked to physical inactivity.

Green transport policies and planning - Adequate sustainable transport policies, integrated transport and spatial planning, logistics optimization, travel demand management and compact, mixed use and transit-oriented development which can reduce the need for private motorization and hence the dependency on fossil fuels are required for the sustainable management of passenger and freight movement. Mobility management policies, for example, can target changes in commuter habits while at the same time creating an enabling environment for change with adequate spaces for non-motorized transport, making more sustainable options the easier choice.

Resilience of transport infrastructure - In view of the long service life of transport infrastructure, environmental impacts assessment as well as climate-risk assessments and monitoring need to be part of project evaluation and decision-making processes and mainstreamed into transport infrastructure planning and operations – this should be paired with strategies to enhance the climate resilience and adaptation of key transport infrastructure. Strong legal, regulatory and policy frameworks have an important role to play in this context.

Recycling challenges of the sustainability transition- Measures to reduce the lifecycle environmental impact of vehicles, such as material efficiency strategies (e.g., light-weight design, product lifetime extension and recycling), with potentially significant impact on life-cycle emissions, should be employed. In addition, adequate legislation should be passed, such as for example obligations for car manufacturers to increase the rate of recycling of motor vehicle parts and material. In this context, challenges can, however, occur with regard to no longer used vehicles and infrastructure which urgently need to be addressed, such as for

example regarding the trade with used vehicles which can result in significant environmental and safety issues.

Targeted means of implementation and data - Especially for developing countries, including countries in special situations, it will be important to explore ways to raise and allocate the necessary financial resources and gather the necessary technologies and capacities for implementing sustainable transport systems, including as part of Nationally Determined Contributions (NDCs) under the Paris Climate Agreement and in National Adaptation Plans. With important data and knowledge gaps persisting, additional research and data collection is needed and should be supported and facilitated.

A green, resilient and inclusive COVID-19 recovery - Lessons learned from COVID-19 response and recovery should be considered when planning and implementing future sustainable and resilient transport systems. For example, many cities have reacted to the COVID-19 pandemic by pedestrianizing streets and expanding cycle lanes. These paradigm shifts have the potential to have long-term impacts by lowering GHG emissions, air and noise pollution, and should be bolstered, paying particular attention to road safety and equitable access for vulnerable groups. Moreover, following severe disruption, public transport systems should be rebuilt with the needs and health of all citizens in mind, using electric mobility, where feasible, and services tailored to all.

IV. Guiding questions

1. How can the transport sector be further mobilized for climate action?
2. What are the most promising policies, technologies, or initiatives for shifting transport systems toward green development and curbing emissions and pollution from the sector that can be acted on over the next 10 year, including through COVID-19 response and recovery efforts? Are there "bright spots" or good practices? What is needed to scale these up or accelerate uptake and investment, placing the most vulnerable at the heart of sustainable transport?
3. What are the most prominent barriers to overcome for advancing climate change mitigation, adaptation and resilience in the transport sector considering the long lifetime of infrastructure? What related knowledge and data gaps hamper informed long-term planning and how can these be effectively addressed?
4. What are promising areas for strengthening and accelerating financing, technology transfer and capacity-building for developing countries, including countries in special situations, in support of their path to sustainable transport and related climate change adaptation, mitigation and resilience measures?

Programme

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Moderator:

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Other stakeholders:

- Mr. Fu Gangfeng, Director of the Board and President, Cosco Shipping