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Partnership on Sustainable, Low Carbon Transport

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Bridging Generations for a Zero-Emission Future

Young Leaders' Perspectives for Just Transformations to Sustainable Transport

A paper by SLOCAT-VREF
Young Leaders in Sustainable Transport

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About the Young Leaders in Transport Programme and this Paper

SLOCAT and the Volvo Research and Educational Foundations (VREF) launched in May 2019 the Young Leaders in Sustainable Transport programme. The programme builds bridges between the transport community and young people and explores new perspectives by creating an interface between knowledge and policy. It will also raise the capacity of young people and provide them new skills in evidence-based policy analysis for sustainable transport.

Young people are recognised as the torchbearers of sustainable development and the vanguards in the struggle against climate change. By working directly with young leaders, the transport community will empower the generation who can help foster far-reaching and unprecedented change and build long-lasting bridges with other constituencies.

The voice of young people needs to be heard

COP30 places people at the centre of climate action. It embraces global participation through the Global Mutirão, an initiative designed to connect with people's realities on the ground
In this spirit, the fifth cohort of SLOCAT – VREF Young Leaders in Sustainable Transport are sharing their perspectives on effective climate action in transport, drawing on their areas of expertise, which include energy, freight transport, road safety and transit-oriented development.
Each Young Leader showcases the benefits of a specific action, outlines what a global goal could cover and identifies synergies with the Sustainable Development Goals (SDGs). Their work also shows the role that young professionals and young people play in implementing these actions.

Find more information here: https://slocat.net/youngleaders/
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Introduction: It's Now or Never for Climate and Sustainability Action in Transport

Transport connects people, goods, and economies - it's how people access jobs, education and health services, food reaches markets, and economic activity happens. The sector produced roughly 7% of global GDP and employed 196 million people worldwide in 2021, yet it's also one of the largest sources of greenhouse gas (GHG) and carbon dioxide (CO_2) emissions and among the most exposed to climate risks like flooding and heat. Meanwhile, persistent gaps remain in inclusive access to reliable,efficient, and affordable transport, leaving billions of people worldwide in situations of inequality and transport poverty, while limiting the economic development of countries.

In 2023, the transport sector remained the second-largest and fastest growing emitting sector, responsible for 15.9% of global GHG and for 21.9% of global CO_2 emissions. Transport was also the fastest growing energy-use sector in 2023, consuming 27% of the global energy for end-uses. Despite advances in renewable energy and rapid increases in electric vehicle adoption, fossil fuels still accounted for 95.4% of the total energy consumption in the transport sector in 2023. This share has remained virtually unchanged for five decades and is directly linked to the high emissions and air pollution caused by transport activity.

Urgent action is required. According to IPCC, transport emissions need to drop at least by 59% by 2050 compared to 2020 levels to stay within 1.5°C warming. However, demand for moving people and goods is set to grow sharply, Without a paradigm shift, transport's impacts on emissions, air quality and energy use will worsen. Moreover, each year, climate-related disasters cause an estimated USD 15–22 billion in damage to transport infrastructure, hitting low- and middle-income countries (LMICs) hardest. The negative impacts of transport disruptions on a country's connectivity and development are even greater than the huge financial losses in transport assets.

Meeting climate targets in transport will cost an estimated USD 2.7 trillion annually until 2050 - seven times the investment levels in transport in 2023. The investment gaps are highest in LMICs in Africa and Asia, With many transport systems in LMICs still developing, the next decade is a decisive window to avoid inefficient investments and costly retrofits.

It is time to set a global goal for transport - Decisions on transport policies and investments determine whether economies can grow and communities become more inclusive while reducing emissions and improving air quality. While countries may start from different contexts, a quantified global goal for transport will provide a shared direction for expanding inclusive, climate-compatible, and resilient transport systems and services worldwide. It will drive coordinated action at scale and enable solutions tailored to local needs for lasting impact.

Scaling up solar power systems to power electric vehicle adoption

By Ayodeji Stephen Adekanbi from Nigeria

A very effective climate action in renewable energy is s**caling of decentralised solar power systems, particularly mini-grids and solar home systems,** to replace fossil fuel-dependent generators and grid extensions in underserved regions. These decentralised grids, especially when smart, promote electric vehicle adoption by providing reliable, affordable charging and reducing communal carbon emissions. Energy has become not just a tool for development but the very fabric around which human interactions and development are woven—powering homes, transport, businesses, healthcare, and education while driving economic growth.

In Nigeria, where over 85 million people lack access to reliable electricity and frequent blackouts hinder progress, transitioning to solar not only slashes greenhouse gas emissions by **displacing diesel generators** (which account for up to 40% of power supply) but also **fosters energy access for all,** aligning with the nation's Energy Transition Plan aiming for net-zero by 2060.[i] This action leverages Nigeria's abundant solar potential, estimated at 210 gigawatt if only 1% of the suitable land can be utilised for project development, offering a cost-effective, resilient solution that reduces carbon footprints while creating local jobs and stimulating rural economies.[ii]

A standout implemented best practice is the **Nigeria Electrification Project (NEP)**, launched in 2019 and concluded in 2025, by the Rural Electrification Agency in partnership with the World Bank, African Development Bank, and private sector players. This initiative has deployed over 125 mini-grids and distributed more than one million solar home systems.[iii] By prioritising private-sector involvement through results-based financing and pay-as-you-go models, NEP has bridged the energy access gap in rural and peri-urban areas, where traditional grid expansion is prohibitively expensive and slow. The results are transformative: it has connected over 5.5 million Nigerians to reliable power, enabling productive uses like irrigation pumps and small businesses, while creating more than 5,000 green jobs in installation, maintenance, and manufacturing. It has avoided over 100,000 tonnes of CO_2 emissions annually by displacing diesel generators. It has boosted household incomes through extended working hours and new enterprises.

[i] International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division, World Bank and World Health Organization (2025), Tracking SDG 7: The Energy Progress Report, https://trackingsdg7.esmap.org/sites/default/files/download-documents/sdg7-report2025-0804-v11.pdf; Energy Transition Office, Nigeria (2021), Nigeria Energy Transition Plan, https://energytransition.gov.ng/.
[ii] IRENA and African Development Bank (AfDB) (2022), Renewable Energy Market Analysis: Africa and Its Regions, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jan/IRENA_Market_Africa_2022.pdf.
[iii] World Bank (2025), Expanding Nigeria's mini grid market, https://www.worldbank.org/en/news/feature/2025/03/07/expanding-nigeria-s-mini-grid-market.

The efforts were scaled for broader replication under the subsequent Distributed Access through Renewable Energy Scale-up (DARES) project, aiming to reach 17.5 million people.[i] Together, the NEP initiative and the DARES project, which launched in March 2025, will result in providing access to **reliable electricity to 23 million people** and further strengthening the case for electric vehicle adoption across the country.

Scaling decentralised solar energy directly supports global transport decarbonisation goals by powering electric vehicle charging infrastructure and electrified public transport systems. In the energy transition, the **global community is pursuing the goal of tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements by 2030**.[ii] Any global goals on transport will benefit from clean power grids and enhanced access to solar-based electricity. Renewable-powered electricity reduces reliance on fossil fuel imports and cuts sector emissions. Tailpipe emissions from passenger and public fleets can be reduced by up to 90% through widespread adoption of electric vehicles, particularly in scenarios with a 'renewable-heavy' electricity grid (80–90% renewables), where lifecycle greenhouse gas reductions reach 65–70% compared to conventional vehicles.[iii] Moreover, solar mini-grids can charge electric buses and electric bikes in off-grid areas, fostering a shift to low-carbon mobility while enhancing energy security amid rising transport demands.

Scaling decentralised solar power advances multiple Sustainable Development Goals (SDGs): it advances **SDG 3 (Good Health and Well-being)** by curbing air pollution from diesel vehicles; **SDG 7 (Affordable and Clean Energy)** by increasing renewable shares; **SDG 8 (Decent Work and Economic Growth)** with job creation in green tech; **SDG 11 (Sustainable Cities and Communities)** through efficient urban transport; and **SDG 13 (Climate Action)** via emission reductions.

Young professionals can drive broad implementation by leading innovation in solar-powered electric vehicle integration, such as **developing affordable charging apps or community-owned grids and public charging stations.** They can also **advocate for policy reforms** like subsidies for green transport, and **partner with non-governmental organisations for training programs in rural installations**, thereby accelerating the just transition and unlocking 10 million jobs if 50% of all vehicles manufactured were electric.[iv]

[i] World Bank (2023), Nigeria to Expand Access to Clean Energy for 17.5 Million People, https://www.worldbank.org/en/news/press-release/2023/12/15/nigeria-to-expand-access-to-clean-energy-for-17-5-million-people.
[ii] UNFCCC (2023), Outcome of the first global stocktake, https://unfccc.int/topics/global-stocktake/about-the-global-stocktake/outcome-of-the-first-global-stocktake.
[iii] IEA (2021), Net Zero by 2050, A Roadmap for the Global Energy Sector, https://www.iea.org/reports/net-zero-by-2050.
[iv] International Labour Organization (2020), Jobs in green and healthy transport, Making the green shift, https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40dcomm/%40publ/documents/publication/wcms_745151.pdf.

Road-rail intermodal freight systems

By Olanike Christiana Babalola from Nigeria

The **adoption of road–rail intermodal systems** - shifting long-distance cargo from trucks to rail while retaining trucks for first- and last-mile delivery - reduces greenhouse gas emissions, improves energy efficiency, and lowers operating costs compared with road-only freight.[i] In many African countries and other emerging economies, economic dynamism is tempered by severe transport-related challenges, including **chronic congestion, inefficient modal integration, high logistics costs, and escalating environmental impacts**. Intermodality emerges as a scalable and context-sensitive measure that can be embedded within sustainable long-haul freight transportation planning.[ii]

An implemented best practice in freight decarbonisation is the integration of logistics measures into policy and operations. For instance, the **Kenyan Standard Gauge Railway** has eased congestion and cut emissions along the Northern and Southern Corridors. In Nigeria, linking the Lagos-Kano and Lagos-Port Harcourt rail corridors to Lagos Apapa port could deliver similar results.[iii]

To ensure intermodality, **Sustainable Urban Mobility Plans (SUMPs)**, **port sustainability strategies, and green benchmarking tools** have proven to be effective.[iv] An example of these tools includes the Green Logistics Performance Index, which shows that EU states achieved lower emissions and higher competitiveness through **modal shift incentives, eco-driving, and clean technology adoption.**[v] Moreover, operational excellence methods applied globally confirm that lean and green practices improve efficiency and sustainability together.[vi] Companies such as Girteka have shown measurable benefits by combining intermodal transport with digital tools, achieving over 23.6 million kilograms of CO_2 savings in 2024.[vii]

[i] J.T.M. Pinto et al. (2018), Road-rail intermodal freight transport as a strategy for climate change mitigation, Environmental Development, Volume 25, https://doi.org/10.1016/j.envdev.2017.07.005.
[ii] V. Santen (2013), Exploring logistics actions enabling environmentally sustainable freight transport, https://publications.lib.chalmers.se/records/fulltext/172690/172690.pdf.
[iii] A.R. Goetz and S. Alexander (2019), Urban Goods Movement and Local Climate Action Plans: Assessing Strategies to Reduce Greenhouse Gas Emissions from Urban Freight Transportation, https://transweb.sjsu.edu/research/1796-Urban-Freight-Climate-Action-Plans.
[iv] M. Maslaric et al. (2024), Sustainable Urban Mobility Planning in the Port Areas: A Case Study, Sustainability, 16(2), 514, https://doi.org/10.3390/su16020514.
[v] M. Starostka-Patyk, P. Bajdor and J. Białas (2024), Green Logistics Performance Index as a benchmarking tool for EU countries environmental sustainability, https://doi.org/10.1016/j.ecolind.2023.111396.
[vi] C.J.C. Jabbour et al. (2019), An exploration of operational excellence methodologies implementation in the logistics sector: A global study, https://doi.org/10.1108/TQM-10-2023-0313.
[vii] T. Chapman (2025), Girteka's Path to Decarbonisation in Transport and Logistics, SupplyChain Digital, https://supplychaindigital.com/sustainability/girteka-decarbonisation-in-transport-logistics.

At ports, sustainability programs aligned with the SDGs demonstrate how governance and stakeholder engagement drive low-carbon transitions.[i] Collectively, these practices prove that embedding freight into broader climate governance yields scalable and durable results.[ii]

Road–rail intermodality directly supports global decarbonisation goals by reducing emissions, cutting costs for long-haul freight transport and improving public health. The synergies with the SDGs are evident: contributing to advancing **SDG 9 (Industry, Innovation and Infrastructure)** through improved freight systems, **SDG 11 (Sustainable Cities and Communities)** through reduced congestion and pollution, and **SDG 13 (Climate Action)** through decarbonisation.[iii]

Building on these findings, **young professionals can play a catalytic role by innovating digital tools, engaging in policy advocacy, and advancing implementation projects** that help scale sustainable freight solutions globally.

[i] M. Puig et al. (2017), Revisiting port sustainability as a foundation for the implementation of the United Nations SDGs, https://doi.org/10.1186/s41072-021-00101-6.
[ii] V. Santen (2013), Exploring logistics actions enabling environmentally sustainable freight transport, https://publications.lib.chalmers.se/records/fulltext/172690/172690.pdf.
[iii] M. Puig et al. (2017), Revisiting port sustainability as a foundation for the implementation of the United Nations SDGs, https://doi.org/10.1186/s41072-021-00101-6.

Transit-oriented development

By Mohammed Musah from Ghana

Transit-oriented development (TOD) offers one of the most powerful levers for climate action in transport. By reshaping cities around high density development with a mix of residential, shopping, commercial and community uses around a public transport hub and a surrounding urban environment, TOD **prioritises the mobility needs of all people over cars.** By clustering housing, jobs and essential services within walkable and bikeable distances of high-capacity public transport, TOD helps **reduce car dependency, cuts energy use, and lowers greenhouse gas emissions**.[i] As the Intergovernmental Panel on Climate Change (IPCC) has pointed out, this compact, mixed-use urban development model not only mitigates climate change but also **strengthens resilience by reducing sprawl, conserving land and making cities more efficient and inclusive**.[ii]

Curitiba, a city in the host country of COP30 Brazil, is a good example of TOD implementation. For decades, the city has **integrated land-use and transport planning around a Bus Rapid Transit (BRT) system** supported by zoning incentives for mixed-use development along key public transport corridors.[iii] This approach has significantly **lowered per capita greenhouse gas emissions and fuel consumption by 25–30% compared to other Brazilian cities.** Curitiba demonstrates that TOD backed by a strong planning and political vision can simultaneously reduce emissions, expand mobility options and enhance social equity.[iv] Despite Curitiba becoming a benchmark, constant impact evaluation is key in all implementation cases as the city's TOD may have pushed low-income households to the peripheries and thus limited their ability to fully benefit from public transport systems.[v]

[i] ITDP (2017), The TOD Standard 3.0, https://itdp.org/publication/tod-standard/.
[ii] Intergovernmental Panel on Climate Change (IPCC) (2022), Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the IPCC, https://www.ipcc.ch/report/ar6/wg3/.
[iii] J. Rabinovitch and J. Leitman (1996), Urban planning in Curitiba. Scientific American, 274(3), 46–53, https://www.jstor.org/stable/24989439.
[iv] H. Levinson et al. (2003), Bus Rapid Transit Volume 1: Case Studies in Bus Rapid Transit, TCRP Report 90, Case Study Vol. 1, https://trb.org/publications/tcrp/tcrp_rpt_90v1.pdf; R. Cervero (2013), Transport Infrastructure and the Environment: Sustainable Mobility and Urbanism, Journal of Transport and Land Use, https://hdl.handle.net/10419/92377.
[v] A.L.B. Turbay, R.H.M. Pereira and R. Firmino (2024), The equity implications of TOD in Curitiba, Case Studies on Transport Policy, 16(4), 101211, https://doi.org/10.1016/j.cstp.2024.101211.

Against the COP30 backdrop and the calls to accelerate climate action by 2035, TOD must be enabled a transformative pathway to align urban growth and expansion with the goal of the Paris Agreement to keep global warming to 1.5°C. TOD is also a pathway for sustainable urbanisation aligned with the New Urban Agenda and SDGs, with particularly strong synergies with the advancement: **SDG 3 (Good Health and Well-being)** via improved air quality and more active mobility; **SDG 11 (Sustainable Cities and Communities)** through inclusive urban design; and **SDG 13 (Climate Action)** through emission reductions.[i]

Young professionals can play vital role in reimagining urban planning, leading advocacy actions, and driving interdisciplinary collaboration. This includes studying the technical, financial, and policy enablers of TOD, leveraging digital platforms to raise awareness of its benefits, and collaborating with peers to publish resources on sustainable urban development.

[i] G.M. Onyango and F.O. Owino (2021), Transit oriented development in medium cities in Africa: Experiences from Kisumu, Kenya, Journal of Geography and Regional Planning, 14(2), 91-104, https://academicjournals.org/journal/JGRP/article-full-text/D1F21B867168.

Protected walking and cycling infrastructure, accessible public transport and traffic calming

By Steffel Ludivin Feudjio Tezong from Cameroon

Providing **protected and accessible walking and cycling infrastructure and public transport, and applying traffic calming measures to reduce speeds** are highly effective road safety and climate actions. Dedicated safe infrastructure separates vulnerable road users from motorised vehicles, while lower speeds significantly cut both crash risk and injuries severity. **A 1% increase in average speed corresponds to a 4% rise in fatal crashes**, underscoring the importance of speed management.[i] A recent review of city-wide 30 km/h speed limit implementations in Europe, covering evaluation results from 40 cities, demonstrated that such limits led to average **reductions of 37% in road crash fatalities, 18% in emissions, 2.5 dB in noise pollution, and 7% in fuel consumption.**[ii] Moreover, studies show that people who are cycling had 84% lower life cycle CO_2 emissions than non-cyclists.[iii] In short, **safer roads are also cleaner and more climate-friendly** and many best practices in cities around the world can illustrate that.

Dakar, Senegal, began operating a **public transport system via the BRT** in 2024. The highly anticipated corridor spans over 18 kilometers, with 23 stations and a fleet of 121 articulated electric buses. Designed to maximise benefits, Dakar's BRT is fully electric, with buses recharging overnight and stations powered by solar energy, contributing to significant reductions in CO_2, noise, and air pollution. To further enhance sustainability, the city has **upgraded walking and cycling infrastructure along the route, promoting safe active mobility**. The system was also built with **universal accessibility** in mind -level boarding platforms make it easier for children, older adults, parents with strollers and persons with disabilities to use public transport.

The BRT is expected to serve 300,000 passengers per day, cutting average journey times from 95 to 45 minutes and generating major time and productivity savings for users. Moreover, the **all-electric fleet is projected to avoid over 53,000 tonnes of CO_2 emissions per year,** showcasing how investments in safe, efficient, and inclusive public transport can simultaneously advance road safety, equity, and climate action. Dakar was awarded with the 2025 Sustainable Transport Award presented by the Institute for Transportation and Development Policy (ITDP) for these efforts.[iv]

[i] International Transport Forum (2018), Speed and Crash Risk Speed and Crash Risk, https://www.itf-oecd.org/speed-crash-risk.
[ii] G. Yannis and E. Michelaraki (2024), Review of City-Wide 30 km/h Speed Limit Benefits in Europe, Sustainability, 16(11), https://doi.org/10.3390/su16114382.
[iii] C. Brand et al. (2021), The climate change mitigation effects of daily active travel in cities, Transportation Research Part D: Transport and Environment, Volume 93, 102764, https://www.sciencedirect.com/science/article/pii/S1361920921000687?via%3Dihub.
[iv] Institute for Transportation and Development Policy (ITDP) (2025), Dakar, Senegal Receives the 2025 Sustainable Transport Award as the STA Program Celebrates 20 Years, https://itdp.org/2025/01/07/dakar-senegal-receives-2025-sustainable-transport-award/.

Measures such as speed management, safe street design, and public transport investment also reduce private car dependence, cut crash risks, and lower emissions. At national and local levels, a realistic goal is to ensure that by 2050:

- **all urban areas adopt maximum speed limits of 30 km/h on residential and mixed-use streets, supported by traffic calming measures that effectively enforce these speed values;**
- **at least 50% of major corridors are designed with safe crossings and protected cycle lanes, and**
- **public transport infrastructure and ridership is expanded by 30%.**

These measures advance **SDG 3 (Good Health and Well-being), SDG 11 (Sustainable Cities and Communities)** and **SDG 13 (Climate Action)**.

Children and young people bear the heaviest burden of road crashes and pollution, while future generations will live longest with the consequences of today's transport choices. Positioning road safety as climate benefit strengthens the case for embedding mobility into global climate negotiations.

Young professionals can accelerate implementation by generating evidence on the safety–climate synergies, d**eveloping digital tools to monitor impacts, co-creating solutions with communities, advocating** for policy alignment, and **building cross-sectoral capacity**. In doing so, young professionals bridge evidence, innovation, and policy, ensuring that intergenerational voices guide the transition toward safer and low-carbon mobility.

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