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Capacity Building for Transport Transformation

KEY FINDINGS

- Capacity development is a foundational element of broader social, economic and institutional transformation.
- Capacity development and skills play a dual role as both enablers of economic and social change and as a protective buffer for transport professionals and workers against the impacts of socio-economic, technical, climate and environmental change.
- Between 2018 and 2023, public transport operators reported a 15% increase in engineering and maintenance roles, a 13% increase in drivers, and a 34% increase in management positions, reflecting expanded training needs across rail and bus systems.
- Transport service providers and infrastructure operators also require well-trained professionals in light of the large-scale investments needed in sustainable transport – such as railway systems, multi-modal logistics, intelligent transport systems, and transport planning and data.
- A key enabling factor for countries to be able to set and meet climate and sustainability targets is improving or developing the abilities of national-level and sub-national authorities. Realising climate and sustainability goals relies on the ability of professionals in both the public sector (e.g., institutions and communities) and the private sector (e.g., shippers, carriers, logistics service providers) to bring the needed capacities to implement ambitious national strategies.
- Although definitions vary, capacity is defined here as "the ability of people, organisations and society as a whole to manage their affairs successfully", while capacity development is understood as "the process whereby people, organisations and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time, in order to achieve development results."
- Capacity development activities vary in format and duration. Recent research investigating capacity building activities in low- and medium-income countries in Africa and in South Asia identified 14 capacity development formats, ranging from seminars and workshops to customised knowledge reports and open-access data portals.
- Capacity building formats with short durations (usually taking less than a month) include workshops, seminars, trainings, conferences and study tours. In contrast, activities such as scholarships and formal education programmes can extend up to several years.

Identifying capacity gaps

- The formulation of capacity development programmes is ideally preceded by an assessment of existing capacity assets and needs. This ensures that the designed programme is both relevant to the transport institution's defined capacities and responsive to the identified gaps.
- Despite broad expert agreement on the importance of conducting such capacity needs assessments, practice across transport entities does not always reflect this ideal. The approach to capacity development in many transport bodies tends to be *reactive* rather than *proactive*.
- A 2025 study by the Transformative Urban Mobility Initiative (TUMI) included a capacity gap analysis conducted across the three levels of capacity: individual, institutional and societal. Participating transport stakeholders were asked to rate the importance of specific capacities in enabling low-carbon transport in their local context, compared to their current levels of capacity. In doing so, the study was able to identify the three largest capacity gaps currently faced by transport stakeholders: sustainability within educational programmes, enabling societal frameworks, and number of staff.

KEY FINDINGS

Lack of sustainability within educational programmes

- Although education is increasingly acknowledged in international climate and sustainability policy, investment in climate and sustainability education has not matched the urgency of the current climate crisis. The 2025 TUMI study highlighted that the largest capacity gap identified across the different capacity levels was the lack of sustainability within formal educational programmes.
- The study's thematic analysis revealed that the most prevalent disciplines addressing transport in formal education are transport engineering, urban planning and architecture, transport economics, and transport logistics and supply chain management. It points to the under-representation of sustainability and climate change themes within existing transport curricula.
- A key implication of the gap in sustainability within educational programmes is that transport stakeholders struggle to hire qualified personnel. Existing staff members at transport entities often face challenges in carrying out their responsibilities due to both technical and functional capacity gaps.
- Trends such as digital transformation, electrification, and platform-based mobility and logistics services, along with the transformational needs and growing complexities of urban and mobility planning (such as adaptation and resilience to the impacts of climate change, shocks and crises), require a wide range of transport professions and jobs to acquire new skills.
- Promoting learning and professional development of employees is one of the cornerstones of staff attraction and retention policies. In such settings, the costs and risks associated with developing the educational and technical backgrounds of employees are either fully borne by the employer, or shared between the employer and employee.
- Transport stakeholders do not always have dedicated resources and/or policies in place to support individual employees to continue their professional development. Consequently, staff members are often forced to self-fund and self-manage their time to pursue external educational programmes. In other cases, employees may take an (unpaid) leave of absence, particularly when the educational programme mandates in-person (synchronous) engagement.
- Without institutionalised policies and budgets for continuing professional development, employees may struggle to engage in further learning, leading to bigger institutional knowledge gaps.
- Educational opportunities abroad can bring valuable exposure to global practices and networks, but reliance on them for professional development carries important implications and raises questions around accessibility, equity and scalability.
- If individuals seek educational programmes abroad to address the local sustainable educational gap, a potential outcome is brain drain, or the migration of skilled professionals from low- and middle-income countries to high-income countries.
- Alternatively, ensuring that the knowledge and skills for climate and sustainability action in transport are locally taught and nurtured can support lasting and scalable human and economic development in a given region, country or city.

KEY FINDINGS

Addressing the gap in sustainability in educational programmes

- The international transport community provides a variety of capacity building activities aimed at addressing the gaps around sustainability within educational programmes.
- International organisations, non-governmental organisations and foundations are collaborating with local organisations and universities to offer capacity development opportunities that range from in-depth multi-year university-level degrees and curricula development, to specialised executive education and graduate diploma programmes, to shorter term certified courses.
- Some capacity development programmes promote the inclusion and participation of applicants from low- and middle-income countries and of women by offering scholarships or reduced tuition fees.

Way forward

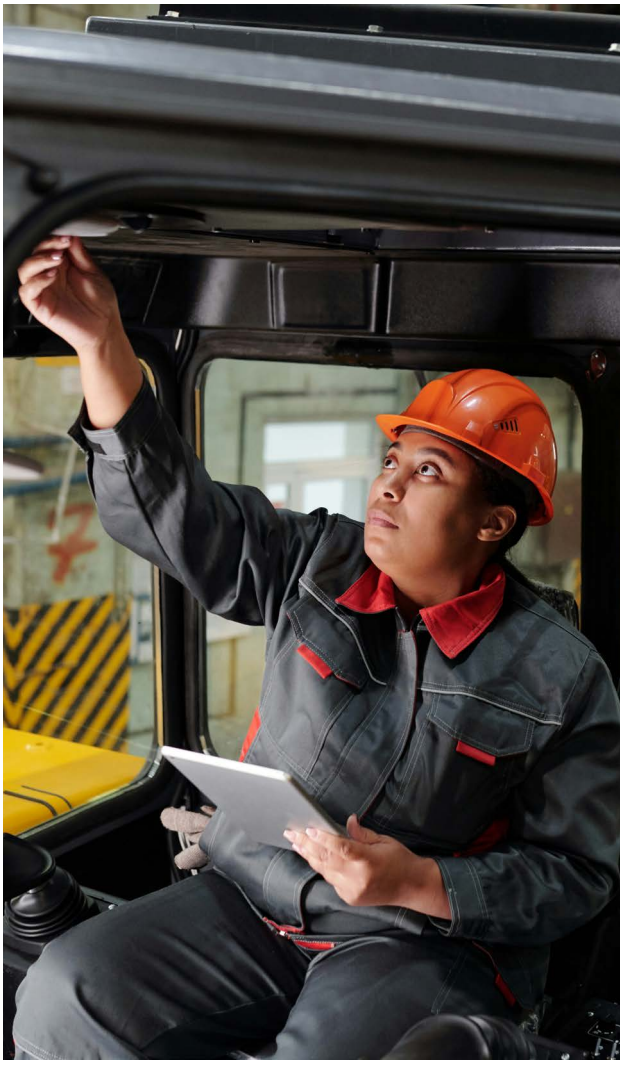
- Education remains an undervalued instrument in formulating and implementing emission mitigation, adaptation, resilience and broader sustainability solutions in transport. A significant structural gap in current curricula and institutional arrangements prevails, particularly the lack of systemic integration of sustainability into education and the persistent disconnect between theoretical research and its application in practice.
- This disconnect is symptomatic of broader global challenges in ensuring equitable access to quality, relevant, and actionable education and knowledge and effective knowledge transfer, particularly in low- and middle-income countries. Such inequality deepens disparities in how regions can respond to transport, climate and sustainability challenges. In response, various international organisations and institutions have support capacity through international development co-operation and official development assistance (ODA).
- A geographically balanced design of capacity development programmes is essential, as many current initiatives remain concentrated in capital cities or national-level agencies, often leaving sub-national and local authorities underserved.
- Successful capacity building initiatives demonstrate that multi-stakeholder collaboration can bridge these gaps.
- Sustainable, long-term strategies should prioritise structural changes in higher education curricula, and foster collaboration among local universities, global institutions, the transport sector and development co-operation actors.
- To ensure that these structural reforms and partnerships are effective over time, it is essential to implement continuous monitoring and evaluation systems.
- In the near term, one option could be to create a globally supported scholarship fund dedicated to studies in sustainable transport, backed by stakeholders across the international transport sector.
- Investing in stronger academic collaboration between universities in the Global North and the Global South presents a strategic opportunity for capacity building in the transport sector. ODA funding could be effectively channelled to support such partnerships, particularly by engaging second-tier universities that serve broader societal segments beyond economically privileged groups.
- By promoting equitable and sustainable access to specialised education and ensuring its relevance to practice, the international transport community can accelerate the transition to sustainable transport systems and services.

Context, challenges and opportunities

Capacity development[i] is a foundational element of broader social, economic and institutional transformation. Labour markets are being reshaped, new types of jobs are emerging, and existing roles are being redefined. These structural shifts require long-term strategies for education, training, workforce development and institutional transformation.

Capacity development and skills play a dual role as both enablers of economic and social change and as a protective buffer for transport professionals and workers against the impacts of socio-economic, technical, climate and environmental change. This broader framing is particularly important in the context of the transitions required towards sustainable passenger and freight transport.

Between 2018 and 2023, public transport operators reported a 15% increase in engineering and maintenance roles, a 13% increase in drivers, and a 34% increase in management positions, reflecting expanded training needs across rail and bus systems.[1] Some metro systems, as in Chile, have introduced automation with negotiated transitions where new employees directly enter automated roles, while existing workers may voluntarily transfer with wage incentives.[2] Technical upskilling, particularly for electric buses and automated metro lines, is being implemented through dedicated training centres (e.g., in Ireland) and pipeline programmes (e.g., the bus captain school focused on women in Jakarta, Indonesia).[3]



Despite this, older workers in metro systems face adaptation challenges, and shortages remain in technical roles such as electric vehicle maintenance, signalling a continued need for structured training investment.[4] For the rail sector, recruiting young talent, strengthening rail freight transport, and increasing capacity are key actions deemed essential to making railway technology fit for the transport transition.[5]

Transport service providers and infrastructure operators also require well-trained professionals in light of the large-scale investments needed in sustainable transport – such as railway systems, multi-modal logistics, intelligent transport systems, and transport planning and data. In the freight sector, emerging research shows that logistics managers will need new competencies to drive decarbonisation efforts, including an understanding of climate science, greenhouse gas auditing, and familiarity with evolving policy frameworks and technologies.[6] This need also extends to the construction of climate-resilient transport infrastructure, including roads, both within and outside urban areas, highlighting the importance of skills in construction engineering, sustainable transport planning and street design.

A key enabling factor for countries to be able to set and meet climate and sustainability targets is improving or developing the abilities of national-level and sub-national authorities.[7] **Realising climate and sustainability goals relies on the ability of professionals in both the public sector (e.g., institutions and communities) and the private sector (e.g., shippers, carriers, logistics service providers) to bring the needed capacities to implement ambitious national strategies.**[8] Key strategies include Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Long-Term Strategies for Low-Emission Development (LT-LEDS) and the Voluntary National Reviews (VNRs) of the Sustainable

i In this section, "capacity building", "capacity development" and "capacity enhancement" are used synonymously. For the nuances behind these terms, see (Mizrahi, 2004), Capacity Enhancement Indicators: Review of the Literature, https://documents1.worldbank.org/curated/en/117111468763494462/pdf/286140Capacity0enhancement0WBI0WP.pdf

Development Goals (see 2.1 National Transport Pathways to Reach Climate and Sustainability Goals). Researchers have highlighted a widening disconnect between global climate commitments aimed at limiting global warming to 1.5 degrees Celsius (°C), and the actual policies and actions that countries are implementing.[9]

The previous edition of the SLOCAT Global Status Report (GSR) highlighted the need for an overview of existing (and missing) capacity development programmes and activities. It found that information on capacity gaps remains fragmented, sporadic and unquantified at the regional and international levels. As a first step, the third edition of the GSR called for a global stocktake to assess current training programmes, identify institutional and professional skills gaps, promote best practices and strengthen international co-operation to accelerate sustainable transport implementation. It outlined 6 capacity development formats, which have been further expanded into 14 in this edition.

Moreover, the GSR emphasised the need for better data to support planning and evaluation of capacity development activities, and proposed a range of data dimensions to guide more effective capacity development efforts. Three main action areas were identified: standards and guidelines, professional associations, and education.[10]

This fourth edition of the GSR explores recent research trends and developments in capacity development for sustainable transport and mobility transformations. It draws on the findings of two recent studies, conducted on behalf of the High Volume Transport (HVT) Applied Research Programme, and of the Transformative Urban Mobility Initiative (TUMI)[ii].[11]

Capacity development extends beyond training individuals

Although definitions vary, capacity is defined here as "the ability of people, organisations and society as a whole to manage their affairs successfully", while capacity development is understood as "the process whereby people, organisations and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time, in order to achieve development results."[12] In other words, capacity development entails the conscious decision of stakeholders to assess and change the status quo to achieve better outcomes (Box 1).[13]

Box 1. Capacity development levels

International organisations and researchers agree that capacities can be developed across three distinct, but interrelated and mutually reinforcing, analytic levels: individual, institutional and societal (Figure 1). The distinction between these three levels serves to provide a holistic overview of capacity development as a concept, while also identifying the different objectives and skills implied for each capacity level.

Capacity development on the individual level has the objective to improve the knowledge, skills and competences of individuals. Therefore, the focus is on the workforce (its size and educational backgrounds) as well as on the existing educational programmes (both academic and non-academic).

Capacity development on the institutional level is geared towards institutional learning and change management processes to enhance organisational performance. Three sub-capacities are included on the institutional level:

- Governance capacity, which refers to an institution's legal and political authority to plan, finance and implement projects.
- Planning capacity, which reflects the presence of effective plans and procedures to manage projects efficiently; and
- Technical capacity, which indicates the staff's ability to plan and implement projects as desired without significant delays.

Capacity development on the societal level targets the broader context in which individuals and institutions operate, aiming to create conditions that enable and support effective actions. This involves strengthening two key components:

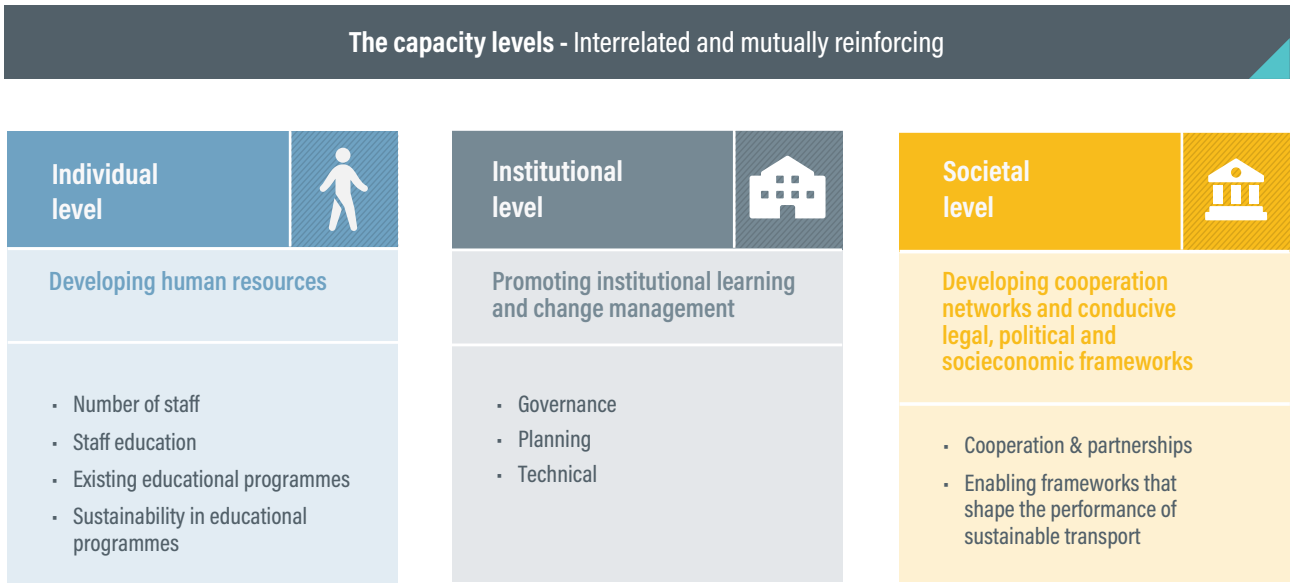
- Enabling environments, which refer to the development of supportive legal, political and socio-economic frameworks; and
- Co-operation partnerships, which focus on building and enhancing collaboration between institutions and individuals to improve co-ordination, knowledge exchange and joint action.

Some scholars further distinguish the definition of capacity based on the levels, where competence is defined as an individual attribute, capability as an organisational attribute and capacity as the combination of both competencies and capabilities.

Source: See endnote 13 for this section.

ii Both studies focused on the capacities of transport institutions without delving into the specific capacities of transport workers. For a good overview of the capacities and needs of transport workers, especially working conditions, see International Transport Workers Federation (2022), A Just Transition for Urban Transport Workers, and see 1.6 A Just Transition in Transport: A Double Challenge

FIGURE 1. Overview of capacity development levels



Capacity development support for stakeholders in passenger and freight transport

Capacity development activities vary in format and duration.[14] **Recent research investigating capacity building activities in low- and medium-income countries in Africa and in South Asia identified 14 capacity development formats, ranging from seminars and workshops to customised knowledge reports and open-access data portals.**[15] Capacity development support for (public) transport stakeholders is provided by thematic experts[iii], including financing institutions, global associations, partnerships, initiatives, think tanks and non-governmental organisations, as well as academic and private sector representatives.

Capacity building formats with short durations (usually taking less than a month) include workshops, seminars, trainings, conferences and study tours (Figure 2).[16] **In contrast, activities such as scholarships and formal education programmes can extend up to several years.** Some capacity building activities – such as the provision of knowledge resources like reports, data portals and libraries – are continuously available, making them an unlimited source of information and capacity building for stakeholders in passenger and freight transport.

Each of these capacity development formats has its strengths and weaknesses, which may be assessed through factors grouped under three main themes: content (thematic focus, profile of experts, context and practice components); target audience (language, profile of partners, incentives and accessibility); and logistics (setting, pace, duration, frequency and co-operation).

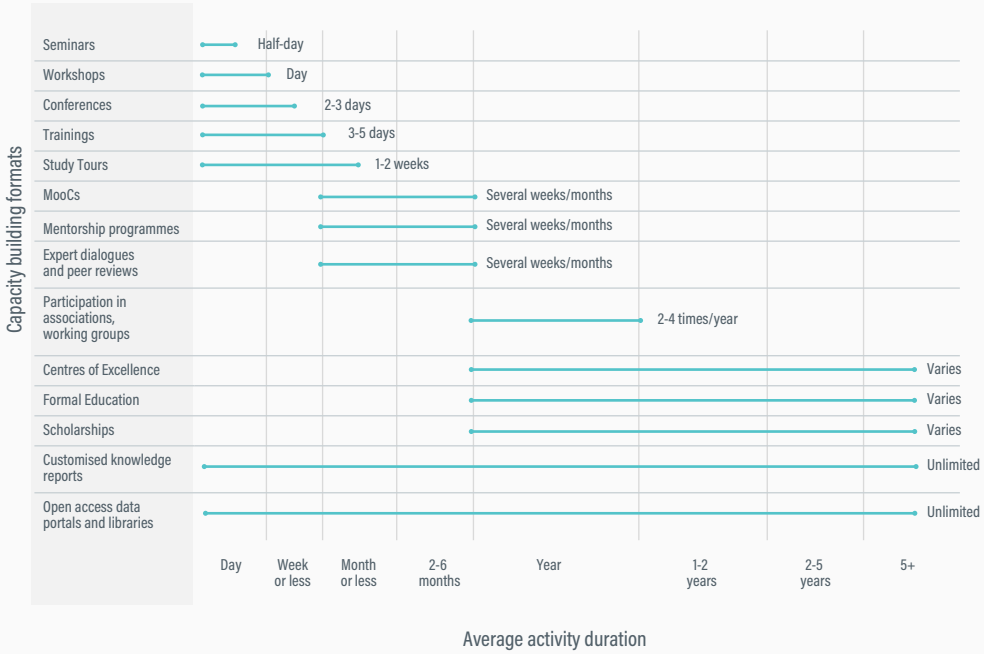
Identifying capacity gaps

The formulation of capacity development programmes is ideally preceded by an assessment of existing capacity assets and needs.[17] **This ensures that the designed programme is both relevant to the transport institution's defined capacities and responsive to the identified gaps.** Some transport authorities have embedded assessment processes and capacity building strategies in place, which

iii Capacity development activities are often organised under the umbrella of international development co-operation and technical assistance.

FIGURE 2. Comparison of average durations of the identified 14 capacity building formats

Comparison of average durations of the identified 14 capacity building formats



A wide range of capacity building formats is available, varying in duration and intensity

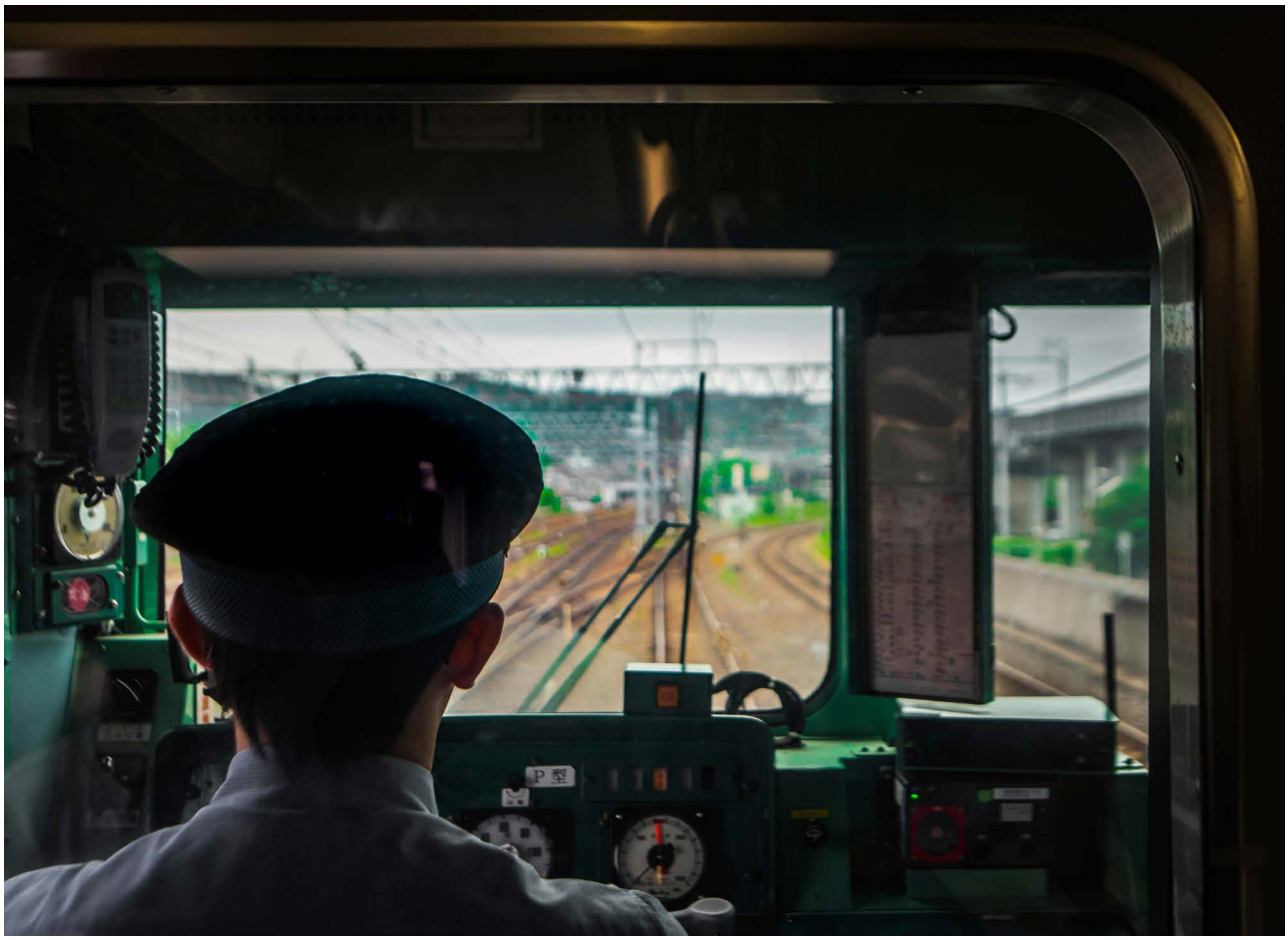
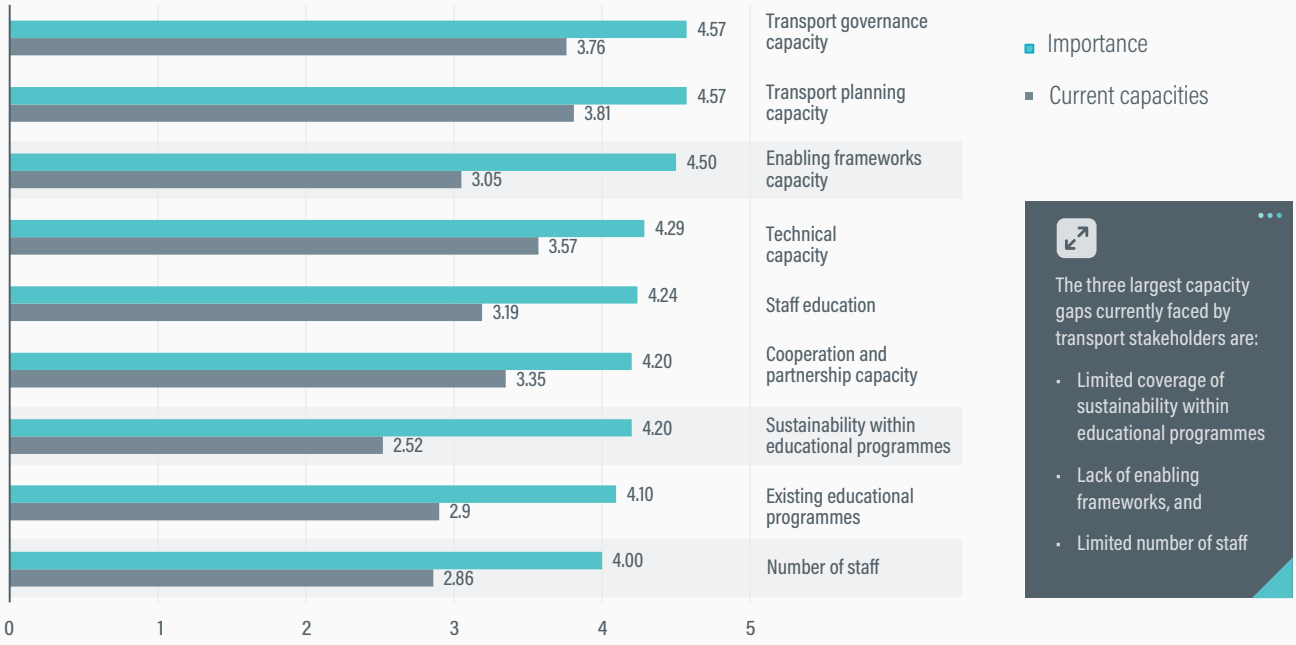


FIGURE 3. Average capacity gaps identified in 21 transport entities across 20 cities



Source: See endnote 26 for this section.

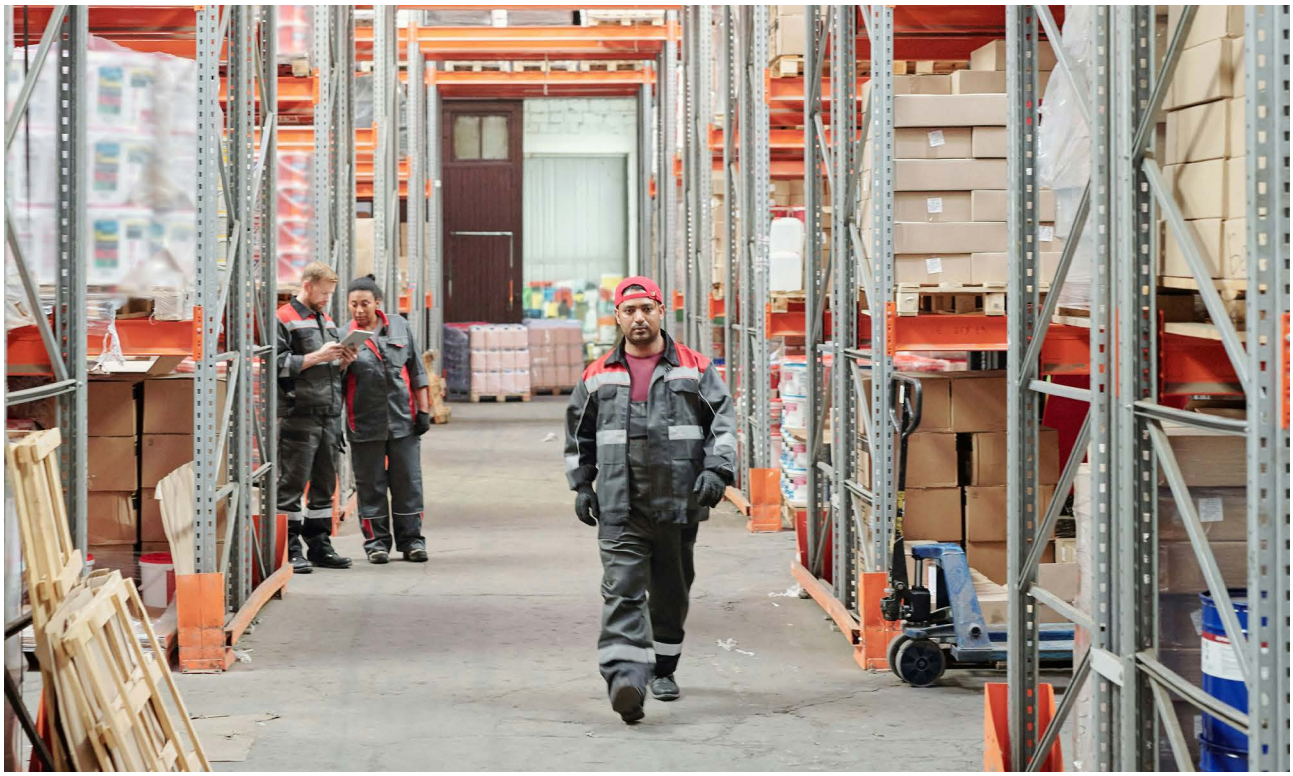
they often operationalise through institutionalised learning management systems. In Nigeria, the Lagos Metropolitan Area Transport Authority (LAMATA) conducts a comprehensive training needs assessment across departments to identify knowledge gaps and skills deficiencies.[18] This assessment is based on feedback from department heads, employee self-assessments and performance reviews.[19]

Despite broad expert agreement on the importance of conducting such capacity needs assessments, practice across transport entities does not always reflect this ideal.[20] **The approach to capacity development in many transport bodies tends to be *reactive* rather than *proactive*.**[21] This is because, in many cases, capacity assessment processes are not embedded within the internal procedures of passenger and freight transport stakeholders; instead, they are often ad-hoc exercises.[22]

A 2025 study by the Transformative Urban Mobility Initiative (TUMI) included a capacity gap analysis conducted across the three levels of capacity: individual, institutional and societal. Participating transport stakeholders were asked to rate the importance of specific capacities in enabling low-carbon transport in their local context, compared to their current levels of capacity. In doing so, the study was able to identify the three largest capacity gaps currently faced by transport stakeholders (Figure 3)**:**[23]

- **Sustainability within educational programmes:** The existing educational programmes do not sufficiently cover sustainable mobility and thus do not equip graduates with the knowledge and skills needed to support the transition to new systems of sustainable transport. In the context of the study, formal education refers to academic and non-academic programmes offered by higher education institutions and local training centres: from university programmes for future transport and logistics managers and decision makers, to professional or executive education programmes and specialised courses and trainings. The definition, however, does not include technical and vocational education provided via apprenticeships, for example.
- **Enabling societal frameworks:** The lack of enabling legal, political and socio-economic factors can hinder actions towards sustainable transport. The transport stakeholders reported significant challenges such as fragmented governance structure, complex approval processes, funding constraints, and the shift in political will and priorities.
- **Number of staff:** The transport stakeholders reported a significant workforce shortage, where they would require nearly double the current number of staff across different departments[iv], covering both technical and functional capacities.

iv The departments included in the study are those focusing on procurement, regulation, marketing and customer management, operations and maintenance, planning, budgeting and construction.



Lack of sustainability within educational programmes

Although education is increasingly acknowledged in international climate and sustainability policy, investment in climate and sustainability education has not matched the urgency of the current climate crisis.[24] **The 2025 TUMI study highlighted that the largest capacity gap identified across the different capacity levels was the lack of sustainability within formal educational programmes.**[25] Transport stakeholders surveyed reported that most educational programmes offered within and outside of universities at the national or sub-national levels provide only a foundational understanding of transport.

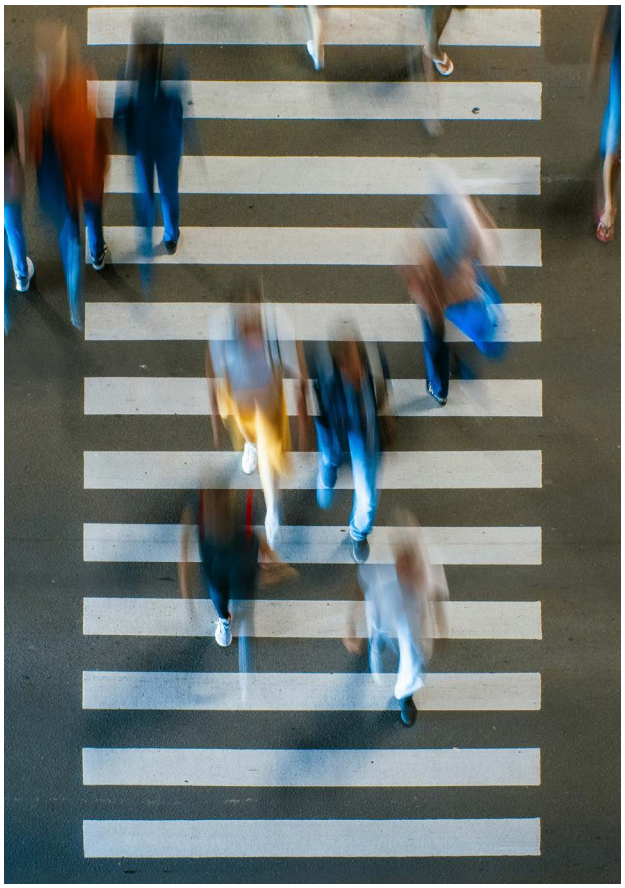
The study's thematic analysis revealed that the most prevalent disciplines addressing transport in formal education are transport engineering, urban planning and architecture, transport economics, and transport logistics and supply chain management. It points to the under-representation of sustainability and climate change themes within existing transport curricula. These themes are most often covered within stand-alone courses, or as modules within an existing course, although a few examples do exist of specialised programmes on sustainable mobility. However, the study was not exhaustive and did not cover all educational programmes in the surveyed countries.

Implications of the gap in sustainability within educational programmes

A key implication of the gap in sustainability within educational programmes is that transport stakeholders struggle to hire qualified personnel. If applicants do not have the right educational background covering sustainable transport and mobility, transport stakeholders may need to undertake a longer and costlier process to allocate the human resources required to successfully plan and implement sustainable transport projects and services within their cities and districts.

Existing staff members at transport entities often face challenges in carrying out their responsibilities due to both technical and functional capacity gaps. On the technical side, staff members may not be equipped with the (up-to-date) knowledge in areas such as sustainable mobility, or integrating climate considerations into transport policies. On a functional level, staff may struggle with cross-departmental co-ordination, budgeting, and project management, which are important in completing day-to-day tasks. These gaps can lead to delays, inefficiencies and poor outcomes in service delivery.

Trends such as digital transformation, electrification, and platform-based mobility and logistics services, along with the transformational needs and growing complexities of urban and mobility planning (such as adaptation and resilience to the impacts of climate change, shocks and crises), require a wide range of transport professions and jobs to acquire new skills. These new requirements



also impact professional education curricula, calling for the adjustment of existing programmes, the development of new ones and the emergence of new professions.

Transport stakeholders that have policies for continuing professional development

Promoting learning and professional development of employees is one of the cornerstones of staff attraction and retention policies.[26] Some employers provide continuous learning opportunities through partnerships with local and national academic institutions and research centres, or by providing trainings and generally supporting employees in attending courses in their field of work.[27] Some transport entities have dedicated person-days and budgets allocated for staff professional development.

In such settings, the costs and risks associated with developing the educational and technical backgrounds of employees are either fully borne by the employer, or shared between the employer and employee. Under a typical employer initiative, the employer assigns individual staff members to pursue short- or long-term educational programmes as part of their daily work arrangements (Box 2).[28] This can be done based on the findings of a capacity and/or training needs assessment conducted by human resources, strategy or other relevant departments.

Box 2. Employer initiative: capacity development process at Liberia's Ministry of Transport

In Liberia, the Ministry of Transport is responsible for developing the capacity of its staff in line with national service training policies. It must designate a training co-ordinator to co-ordinate with the Civil Society Agency and the Liberia Institute of Public Administration, prepare biennial training plans and ensure that all staff have individual development plans that align with their job profiles. Staff are also encouraged to undertake learning opportunities.

Although no formalised procedure exists for obtaining training leave, requests are usually approved and granted as normal working hours or paid leave, especially when aligned with annual capacity needs assessments. Staff members are then required to submit a post-training report by documenting insights and outcomes to ensure knowledge sharing and to contribute to the institutional memory by creating a record of relevant learnings that supports future staff development. This reflects an enabling approach that positions the Ministry as an active supporter of continuous capacity development, on both the individual and institutional levels.

Source: See endnote 29 for this section.

Under a typical employee initiative, individual staff members may put in a request to attend and/or participate in an educational programme, which they may deem as helpful for the delivery of their professional responsibilities (Box 3).[29] Their managers, human resources or other relevant departments would then assess the request based on the need and available resources, etc.

Box 3. Employee initiative: capacity development process at the African Union

At the African Union, learning opportunities, when officially approved, are treated as paid training leave, and in some cases, staff may receive a training allowance. Staff members are required to report on the outcomes of the training to ensure accountability and knowledge sharing, to help integrate new learnings into departmental practices.

In addition to supporting individually initiated opportunities, the African Union's training department pro-actively organises sessions on functional capacities such as leadership and management, inviting departments to nominate staff members to participate. This is complemented by an annual staff appraisal system, which allows supervisors to assess performance and carry out a basic training needs assessment, helping to identify relevant development opportunities for the upcoming year.

Source: See endnote 30 for this section.

Participation in educational programmes may be fully or

partially funded by the employer through concepts such as paid training leave or training allowance. Other models may fully fund the programme but require employees to sign an agreement stating they will return to the workplace after successful completion and mandate their stay within the transport institution for a minimum number of years. Such arrangements are often used to avoid losing qualified personnel in whom the employers have invested.

Transport stakeholders that do not have policies for continuing professional development

Transport stakeholders do not always have dedicated resources and/or policies in place to support individual employees to continue their professional development. Consequently, staff members are often forced to self-fund and self-manage their time to pursue external educational programmes.[30] In some cases, staff members engage in short-term, hybrid programmes that take place on weekends and/or allow asynchronous (flexible) participation. This way, employees may complete the educational programme outside of regular working hours, without needing to step away from their positions.

In other cases, employees may take an (unpaid) leave of absence, particularly when the educational programme mandates in-person (synchronous) engagement. Employees step away from their positions in pursuit of the degree, which would allow them to better perform their jobs upon return. Some workplaces may ensure keeping the employee's position and return after successful programme completion, while others may not. Thus, the employee not only carries the risk of funding the programme and giving up their income channel in the meantime, but also risks not having a job to return to.

Both scenarios show that when the workplace does not value continuing professional development, employees fully carry the direct and indirect costs associated with pursuing educational programmes.

Without institutionalised policies and budgets for continuing professional development, employees may struggle to engage in further learning, leading to bigger institutional knowledge gaps. In cases where existing educational programmes do not sufficiently address the needs of the market, individuals working at transport entities (staff members) and those wishing to be hired (potential staff members) may look outside their countries for educational programmes focused on sustainable transport and mobility.

Educational opportunities abroad can bring valuable exposure to global practices and networks, but reliance on them for professional development carries important implications and raises questions around accessibility, equity and scalability. Educational opportunities abroad are often only accessible to individuals who have the financial and non-financial means to take leave from their jobs and to travel to pursue the programmes. Moreover, the acquired knowledge abroad may not always align with the contextual realities of a local institution's transport environment.

If individuals seek educational programmes abroad to address the local sustainable educational gap, a potential outcome is brain drain, or the migration of skilled professionals from low- and middle-income countries to high-income countries. Research suggests that studying abroad – whether at the beginning of one's professional trajectory or in the middle of it – may increase the likelihood of professionals choosing to stay and/or move to a country different from their own upon programme completion.[31]

Alternatively, ensuring that the knowledge and skills for climate and sustainability action in transport are locally taught and nurtured can support lasting and scalable human and economic development in a given region, country or city.

Addressing the gap in sustainability in educational programmes

The international transport community provides a variety of capacity building activities aimed at addressing the gaps around sustainability within educational programmes. International organisations, non-governmental organisations and foundations are collaborating with local organisations and universities to offer capacity development opportunities that range from in-depth multi-year university-level degrees and curricula development (Boxes 4-8)**, to specialised executive education and graduate diploma programmes** (Boxes 9-10)**, to shorter term certified courses** (Boxes 11-17).[32]

Some capacity development programmes promote the inclusion and participation of applicants from low- and middle-income countries and of women by offering scholarships or reduced tuition fees. Beyond offering scholarships or fee reductions, capacity building programmes must be intentionally designed to integrate gender equality and care responsibilities. Aligning these programmes with broader gender and care agendas not only enhances participation but also increases the transformative impact of mobility policies, making them more responsive to the lived realities of diverse populations.

University degrees and curricula development

Box 4. Post-graduate degrees at the Regional Transport Research and Education Centre in Kumasi, Ghana (TRECK)

TRECK was launched by the Kwame Nkrumah University of Science and Technology (KNUST) in 2018 and is dedicated to strengthening post-graduate education, applied research and professional training in transport. Established as part of the World Bank-funded African Higher Education Centres of Excellence (ACE) programme, TRECK aims to expand the academic-industry collaboration in West Africa, specifically in transport interdisciplinary fields.

LOCATION: Kumasi (Ghana)

FREQUENCY: Annual intake of MSc and MPhil students; short courses offered periodically based on demand

FORMAT: In-person higher education programmes (MSc, MPhil, PhD and short courses)

LANGUAGE: English

INCENTIVES: Dual accreditation by the Ghana Tertiary Education Commission (GTEC) and internationally by the Agency for Quality Assurance through Accreditation of Study Programmes (AQAS) in Germany

COST: Paid tuition fees apply for all programmes; limited scholarships available

TARGET AUDIENCE: Students and public sector transport practitioners

PARTNERS:

- Regional academic partners: Nigeria Building and Road Research Institute, Fourah Bay College (Sierra Leone), University of Sierra Leone, University of Liberia
- National academic partners: Takoradi Technical University, Kumasi Technical University, Building and Road Research Institute (BRRI) in Kumasi, Regional Maritime University
- Government partners: Ministry of Transport, Ghana Highway Authority, Kumasi Metropolitan Assembly
- International partners: World Bank

Box 5. Master in Transport and Sustainable Urban Mobility in Africa by Codatu in Lomé, Togo

The master programme "Transport and Sustainable Urban Mobility in Africa" (*Transport et mobilité urbaine durable en Afrique*) covers the fundamentals of urban mobility in African cities, including global dynamics, mobility demand, transport planning, urban mobility governance, multi-modal transport offer, road management, transport operations, environment and social affairs.

LOCATION: Lomé (Togo)

DURATION: 18 to 24 months

FREQUENCY: Recurring annually since 2015, but paused since COVID-19

FORMAT: Synchronous master programme that includes a 2-3 month internship with a transport authority/operator/consultancy and the preparation of a master's thesis

LANGUAGE: French

COST: Paid fees (USD 3933 or EUR 3,800), with possible support through partial or full scholarships

TARGET AUDIENCE: Students who already have a first master's in a related area, or practitioners who decide to continue their education (in some cases with the encouragement of their employer). EAMAU is affiliated with the West African Economic and Monetary Union (UEMOA), so students are recruited within the region, and part of the cohort did their internship in France.

PARTNERS:

- Université Senghor: delivering the degree
- Ecole Africaine des Métiers de l'Architecture et de l'Urbanisme (EAMAU): hosting the programme
- Codatu: preparing the curriculum, identifying experts beyond the local partners, internships and funding opportunities for scholarships

Box 6. Master in Transport and Sustainable Urban Mobility by Codatu in Rabat, Morocco

The master programme "Transport and Sustainable Urban Mobility" (*Transport et mobilité urbaine durable*) covers sustainable urban mobility, urban mobility planning, governance, financing, transport demand, conducting and implementing public transport projects, developing and operating public transport networks, transport demand and fare policy, and traffic engineering and management.

LOCATION: Rabat (Morocco)

DURATION: 16 months

FREQUENCY: Recurring training since 2017, with four cohorts in 2017, 2018, 2021 and 2023

FORMAT: In-person continuous training for professionals including an internship and the preparation of a master's thesis. Lectures traditionally take place over the weekend every second week to accommodate the schedule of the participating professionals.

LANGUAGE: French

COST: Paid fees (USD 4140 or EUR 4,000), with the possibility of getting a full or partial scholarship

TARGET AUDIENCE: Professionals already appointed, mainly in the Agences d'Urbanisme of various cities in Morocco, experts and consultants, practitioners from local and national authorities.

PARTNERS:

- University Senghor: delivers the degree
- Institut National d'Aménagement et d'Urbanisme (INAU): hosts the programme
- Codatu: conceives the curriculum, identifies external experts, and internship and scholarships opportunities.

Box 7. Master in Sustainable Management and Operations at Kühne Logistics University

Founded in 2010, Kühne Logistics University (KLU) has campuses in Hamburg (Germany) and Saigon (Viet Nam) offering bachelor's, master's, MBA, Ph.D, and executive education programmes in business and management, administration, supply chain management and global logistics. Sustainability is a key competence area within the university and is tackled within the different programmes as part of lectures, dedicated courses and entire study programmes. An example is the part-time Master in Sustainable Management and Operations (SuMO).

LOCATION: Hamburg (Germany)

DURATION: 12 to 18 months

FREQUENCY: Annual intake

FORMAT: Part-time, in-person master's (with a thesis) or a certificate (no thesis); both tracks are required to apply the acquired sustainability concepts directly to a workplace or industry challenge through "Impact Projects"

LANGUAGE: English

COST: Paid tuition fees are required per semester, with the availability of 50% scholarships for applicants from low-and middle-income countries, female executives and staff working in the humanitarian sectors

TARGET AUDIENCE: The programme is offered in part-time format to target professionals with a two-year work experience as a minimum key requirement for admission.

PARTNERS:

- Main donor of KLU is the Kühne Foundation

Box 8. Catalysing Curriculum Change via the VREF Mobility and Access in African Cities (MAC) programme

The Mobility and Access in African Cities (MAC) programme aims to strengthen research and educational capacity on urban access and mobility in sub-Saharan African cities. It focuses on building academic capacity while ensuring that its knowledge outputs reach decision makers, business leaders, civil society, students and other key actors.

In education, MAC has initiated Catalysing Curriculum Change at universities in sub-Saharan Africa to encourage developing and implementing new, research-based postgraduate courses and online learning resources. A scoping study in 2020-2021 identified gaps in transport education, leading to this targeted call for curriculum development rooted in African contexts.

LOCATION: Sub-Saharan Africa (focus on Anglophone regions in Western, Eastern and Southern Africa)

FREQUENCY: Ongoing programme with periodic calls for proposals, workshops, short courses and educational initiatives

FORMAT: Academic capacity building, research funding, study visit grants, curriculum development, workshops, online learning resources and dissemination platforms

LANGUAGE: English

TARGET AUDIENCE: Academic researchers, early-career scholars, sub-Saharan African universities, and institutions engaged in mobility and access research

Executive education and diploma programmes

Box 9. Leading Transport Transitions Programme for city leaders transforming urban mobility

The Leading Transport Transitions programme is an executive education programme focused on equipping urban transport leaders with the policy tools and leadership strategies necessary to drive sustainable mobility transitions in emerging economy cities. Thematically, it addresses critical issues such as rising motorisation, persistent congestion, social exclusion and carbon-intensive transport systems.

LOCATION: Online and in London (United Kingdom)

FORMAT: Hybrid, with online asynchronous and synchronous sessions plus an in-person module with three-day intensive sessions in London (study tour)

LANGUAGE: English

COST: Funded by the German Federal Ministry for Economic Cooperation and Development (BMZ)

TARGET AUDIENCE: Mayors and high-level transport leaders

PARTNERS:

- Transformative Urban Mobility Initiative (TUMI)
- C40 Cities Climate Leadership Group
- LSE Cities at the London School of Economics and Political Science
- BMZ (German Federal Ministry for Economic Cooperation and Development)

Box 10. UITP and TUM Asia Graduate Diploma in Transportation Engineering

The International Association of Public Transport (UITP) is collaborating with the Technical University of Munich Asia (TUM Asia) to bring public transport industry case studies to academia. Targeting mid-level transport professionals with at least five years of experience in the public transport sector, the Graduate Diploma aims to equip participants with the relevant knowledge from the focus areas of Traffic Engineering, Transportation Planning, and Road and Rail Infrastructure Design and Development.

LOCATION: Singapore

DURATION: One module spans 10 half-days on average

FREQUENCY: To be launched in September 2025

FORMAT: In-person block teaching

LANGUAGE: English

INCENTIVES: Upon successful completion of the six modules and passing the exams, participants are awarded the Graduate Diploma in Transportation Engineering

COST: Paid, with preferential pricing for UITP members and for those signing up to multiple modules

TARGET AUDIENCE: Transport professionals based in Singapore and in Asia

Specialised courses and training programmes

Box 11. UITP Academy's Public Transport Fundamentals Training Programme

The UITP Academy offers a large training portfolio focused on diverse aspects of public transport. The programmes address functional capacities such as marketing and communication, but more so technical capacities focusing on the Fundamentals of Public Transport, Planning, Operations and Infrastructure, New Mobility Services, as well as Policy, Planning, Funding and Regulation, etc. The courses are recurring and can follow both an online distance-based learning format, and an in-person classroom-style format.

The Public Transport Fundamentals Training Programme targets professionals who have been in the transport field for less than two years. The learning objective of this long-standing training programme is to provide participants with fundamental knowledge on public transport and sustainable urban mobility through expert-led interactive online sessions.

LOCATION: Varies

DURATION: About 2 weeks

FREQUENCY: Recurring since 2002

FORMAT: Eight interactive online modules (previously in-person)

PACE: Synchronous

LANGUAGE: English

INCENTIVES: Participants receive certification upon successful completion

COST: Paid, with preferential pricing for UITP members and participants from developing countries

TARGET AUDIENCE: Junior transport professionals

Box 12. International Road Federation Road Safety Auditor Training and Certification Programme

This programme aims to enhance road safety by building standardised auditing capacities. It focuses on developing technical skills and competencies necessary for conducting road safety audits, in line with international best practices.

LOCATION: Dar es Salaam (Tanzania), Kampala (Uganda), New Delhi (India)

DURATION: 10 days

FREQUENCY: Recurring annually over a three-year period since 2024

FORMAT: Training course including practical field exercises and a final exam

PACE: Synchronous

LANGUAGE: English

Incentives: Participants receive certification upon successful completion, qualifying them for inclusion in the International Registry of Road Safety Auditors as Road Safety Observers

COST: None; fully funded by the TotalEnergies Foundation

TARGET AUDIENCE: Consulting firms, ministries, national road agencies, private sector engineers and consultants

PARTNERS:

- International Road Federation (IRF): Organiser and content provider
- TotalEnergies Foundation: Funding

Box 13. International Road Assessment Programme training and accreditation: Road Infrastructure Safety and Safest Route Planning

The activities offered within the International Road Assessment Programme (iRAP) focus on the role of safer road infrastructure in improving road safety outcomes. It equips participants with the skills to undertake iRAP assessments and promotes awareness among fleets and logistics stakeholders about road safety risks and safest route planning.

LOCATION: Global

FREQUENCY: Recurring

FORMAT: iRAP training courses, in-person workshops, webinars, conferences, regional workshops and participation in the annual iRAP Innovation Workshop

LANGUAGES: Training and resources are offered in English, Spanish, Portuguese, French, Bahasa Indonesia, Vietnamese, Russian and Hindi.

COST: Most activities, especially webinars and knowledge sessions, are free of charge due to support from the FIA Foundation and other donors

INCENTIVES: The core iRAP training includes full learning management principles suitable for credit hours and associated accreditation and certificates of qualification

TARGET AUDIENCE: Government staff, road industry professionals, iRAP-accredited suppliers, World Bank, UN and regional development banks, investors, non-governmental organisations, youth groups, and fleet managers through the Network of Employers for Traffic Safety (NETS).

IMPACT: Over 1,300 courses and/or capacity building activities completed with more than 75,000 participants worldwide.

PARTNERS:

- Key donors: the FIA Foundation (main donor), Aleatica Foundation, FedEx, 3M and Prudential PLC.
- Strategic partners: United Nations Road Safety Fund, Millennium Challenge Corporation, Global Road Safety Facility, regional development banks and national/sub-national governments.

Box 14. Ochenuel Mobility Solutions' Africa Sustainable Urban Mobility course

The Africa Sustainable Urban Mobility Course focuses on diverse aspects of sustainable urban transport including a dedicated module on urban freight. The urban freight module is usually tailored to the needs of the audience each time the course is delivered in a city.

LOCATION: Varies, notably in: Lagos, Abuja and Benin City (Nigeria), Accra (Ghana), Addis Ababa (Ethiopia), Cairo (Egypt)

DURATION: 3-5 days

FREQUENCY: Conducted 14 times in six African cities since its inception in 2019

FORMAT: In-person workshops and trainings

LANGUAGE: Primarily English, with occasional French translation

INCENTIVES: Offers certification in urban mobility

COST: When supported by an international partner, the course is offered free of charge; otherwise, the hosting institution covers costs on a non-profit basis

TARGET AUDIENCE: City representatives, transport departments and traffic agencies

IMPACT: Since the first edition in Abuja, Nigeria (2019), the course has trained 1,025 participants from 42 African countries

PARTNERS:

- International organisations fund participation, provide expert trainers, or cover costs (e.g., UN-Habitat, UN Environment, GIZ, TUMI, Federal Ministry of Transportation Nigeria, French Development Agency)
- Academic partners support in preparing course content, sharing resources and providing expert trainers (e.g., National Open University of Nigeria Abuja, (Nigeria), Centre for Multi Modal Transport in University of Lagos, (Nigeria), Transport Research and Educational Center, Kwame Nkrumah University of Science and Technology Kumasi (Ghana)

Box 15. Smart Freight Centre Academy's Introduction to Road Freight Electrification

The Smart Freight Centre Academy is a knowledge and learning hub for freight and logistics decarbonisation. Hosted by the international non-profit Smart Freight Centre (SFC), the Academy delivers a wide range of self-paced and live virtual courses designed to build capacity across the logistics value chain – from emissions accounting and sustainable procurement to road freight electrification.

The Introduction to Road Freight Electrification course is designed for stakeholders participating in road freight electrification. Participants explore the urgency and importance of electrifying logistics, the role of road freight in supply chain decarbonisation and the socio-technical aspects of electrifying fleets. The course covers critical decision-making factors for prioritising which operations to electrify and the required groundwork, including vehicle and charging infrastructure.

DURATION: 3-4 hours

FORMAT: Online

PACE: Asynchronous self-paced course (MooC)

LANGUAGE: English

INCENTIVES: Participants earn a certificate of completion after completing the course

TARGET AUDIENCE: Sustainability professionals, logistics managers, procurement officers and corporate teams

Box 16. World Bank Leaders in Urban Transport Planning Workshop

The Leaders in Urban Transport Planning (LUTP) programme empowers policy makers and practitioners with the knowledge and skills needed to diagnose urban mobility challenges and craft effective strategies to promote more liveable, more sustainable cities.

LOCATION: Varies, most recently in: Kathmandu (Nepal), Arusha (Tanzania), Quito (Ecuador)

DURATION: 6-7 days

FREQUENCY: Recurring annually since 2012

FORMAT: In-person and self-study

PACE: Asynchronous self-study modules and in-person interactive training workshop

INCENTIVES: Case studies developed by the Harvard Kennedy School Case Programme, site visits, and certificate of completion upon full attendance and participation in group work

TARGET AUDIENCE: Mid-to senior-level managers and policy makers who occupy or will occupy leadership positions in urban transport planning, governance, management and operations in developing countries

IMPACT: The LUTP programme has trained more than 2,600 practitioners from 105 countries through 81 different workshops

PARTNERS:

- Korean Green Growth Trust Fund (KGGTF): financial partner
- Public-Private Infrastructure Advisory Facility (PPIAF): financial partner
- Partnership Fund for the Sustainable Development Goals: financial partner
- Africa Transport Policy Programme (SSATP): educational partner
- World Resources Institute (WRI): educational partner

Box 17. TUMI training and e-learning courses

The Transformative Urban Mobility Initiative (TUMI), implemented by GIZ and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), offers several specialised courses on its e-learning platform. From courses focusing on transport planning for sustainable cities to zero-emission vehicles deployment and data management for sustainable cities, the courses are recurring, free of charge and can be followed synchronously (live moderation) or asynchronously (self-paced via recorded sessions).

DURATION: 9 weeks

FORMAT: MooC

PACE: Asynchronous self-study modules

LANGUAGE: English

COST: None

INCENTIVES: Participants can obtain an optional certificate upon completion by subscribing to FutureLearn

TARGET AUDIENCE: Transport and city planning practitioners in the Global South, academics, researchers, students, national and city authorities, consultancies and civil society

IMPACT: Over 4,000 participants registered in this course as of July 2025

PARTNERS:

- UCL: course co-development and trainers
- FutureLearn Platform: hosts the MooC and provides the certificates

Way forward

Education remains an undervalued instrument in formulating and implementing emission mitigation, adaptation, resilience and broader sustainability solutions in transport.[33] A significant structural gap in current curricula and institutional arrangements prevails, particularly the lack of systemic integration of sustainability into education and the persistent disconnect between theoretical research and its application in practice.[34]

This disconnect is symptomatic of broader global challenges in ensuring equitable access to quality, relevant, and actionable education and knowledge and effective knowledge transfer, particularly in low- and middle-income countries. Such inequality deepens disparities in how regions can respond to transport, climate and sustainability challenges. In response, various international organisations and institutions have support capacity through international development co-operation and official development assistance (ODA).

Moreover, the persistent phenomenon of brain drain further weakens the local capacity of transport and mobility sectors. Talented individuals often leave their home countries due to limited opportunities for advanced study and professional development, exacerbating human resource shortages in key public and private institutions.

A geographically balanced design of capacity development programmes is essential, as many current initiatives remain concentrated in capital cities or national-level agencies, often leaving sub-national and local authorities underserved. Expanding outreach and tailoring content to smaller cities and rural areas is key to ensuring inclusive and context-relevant mobility transitions.

The interdisciplinary nature of sustainable transport and the multi-disciplinary competencies needed for transformative action in transport governance complicates these dynamics. Beyond traditional fields such as engineering and architecture, the transport sector depends on expertise from other multi-disciplinary areas, such as marketing, workforce development, data analytics, social sciences and political economy. Yet many educational programmes still fail to keep pace with shifting industry needs and market demands.

Successful capacity building initiatives demonstrate that multi-stakeholder collaboration can bridge these gaps. International development agencies, non-governmental organisations, think tanks, academic institutions, private firms and public authorities each bring complementary strengths. Together, they can support various stages of the capacity development project cycle and contribute to sustainable education for transport.

Sustainable, long-term strategies should prioritise structural changes in higher education curricula, and foster collaboration among local universities, global institutions, the transport sector and development co-operation actors. Such collaboration can promote co-developed, interdisciplinary programmes tailored to local contexts, embedding climate and sustainability education into formal qualifications and professional training.

To ensure that these structural reforms and partnerships are effective over time, it is essential to implement continuous monitoring and evaluation systems. These systems can measure not only the quality of capacity building programmes but also the progress in applying acquired knowledge to decision making and sustainable transport management. This approach helps identify gaps between training and real-world practice, enabling adjustments that enhance the transformative impact of education in the sector.

In the near term, one option could be to create a globally supported scholarship fund dedicated to studies in sustainable transport, backed by stakeholders across the international transport sector. This fund could specifically support undergraduate and post-graduate studies in sustainable transport (structured as full-time or part-time programmes). Eligibility criteria could prioritise professionals working in (public) transport institutions with a conditional return-to-origin clause requiring scholarship recipients to contribute to their home countries for a minimum period of time after programme completion.

Investing in stronger academic collaboration between universities in the Global North and the Global South presents a strategic opportunity for capacity building in the transport sector. ODA funding could be effectively channelled to support such partnerships, particularly by engaging second-tier universities that serve broader societal segments beyond economically privileged groups. An example is the Mexican Academic Network for Public Transport, an initiative in its initial phase with support from GIZ.[35] Likewise, the institutionalisation of post-monitoring and evaluation tools – such as impact surveys, institutional performance assessments and alumni networks – can strengthen the continuity and scalability of capacity development initiatives.

By promoting equitable and sustainable access to specialised education and ensuring its relevance to practice, the international transport community can accelerate the transition to sustainable transport systems and services. The range of potential initiatives would not only strengthen institutional capacity but also address the underlying causes of talent loss and skills mismatch.

6.2
CAPACITY BUILDING FOR TRANSPORT TRANSFORMATION

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