Capacity Development as an Accelerator for Sustainable Transport

Transformative Urban Mobility Initiative

Transport for Cairo

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Registered offices Bonn and Eschborn

Friedrich-Ebert-Allee 32 + 36
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 4460-17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 6196 79-0
F +49 6196 79-11 15

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Research Team
Farida Moawad, Ghada Abdul Aziz

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Project background

On behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) under the Transformative Urban Mobility Initiative (TUMI) has commissioned Transport for Cairo (TfC) to conduct a global study on capacity development in sustainable urban mobility.

The objectives of this study align closely with TUMI's mission to support developing countries and emerging economies in their transition towards sustainable urban transport systems, and to achieve local, national, and global targets for sustainable development and decarbonisation. It links to the *Hamburg Charter for Inclusive and Just Mobility* which contains eight Global Principles to Advance Equitable Access and a Just Transition to Sustainable Mobility:

1. Equitable and Climate-Friendly Access to Opportunities
2. Inclusivity in Transport
3. Fair and Dignified Jobs
4. Climate-Friendly Mobility Industries and Businesses
5. Accessible and Climate-Resilient Infrastructure
6. Empowered and Integrated Popular Transport
7. Promotion of Electric Mobility
8. Data, Transparency and Planning

These principles underline the multi-sectorial challenge ahead of the transport sector, which requires multi-disciplinary skills and expertise, and a high level of cooperation between stakeholders with a huge variety of specialisations.

The insights gathered from this study will contribute to closing the capacity gaps in the transport sector. Together with the international transport community, the aim is to create a solid foundation for future capacity building efforts and to help guide international cooperation partners, as well as national and local policymakers, in their efforts to strengthen individual, institutional and societal capacities for developing and operating sustainable and resilient urban transport systems.

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Finally, our sincere appreciation goes to the partners of GIZ and TUMI for their support in shaping this study, including in particular the Alliance for Cycling and Walking Towards International Vitality and Empowerment (ACTIVE), the Asian Development Bank (ADB), the Africa network for Walking and Cycling (ANWAC), the C40 Cities Climate Leadership Group, the High-Volume Transport Applied Research Programme (HVT)/DT Global, ICLEI – Local Governments for Sustainability, the United Nations Environment Programme (UNEP), the Partnership for Active Travel and Health (PATH) and the World Resources Institute (WRI).

About the authors

Transport for Cairo (TfC) provides data, tools and research to improve urban mobility in emerging cities, primarily in Africa. Rapid Urbanization, economic and population growth in times of the climate crisis force us to tackle the complexity and ever-changing urban mobility scene in developing cities. TfC is a disruptive transport consultancy that optimizes existing transport systems and develops flexible and sustainable mobility solutions for our future.

Foreword

The demand for both passenger and freight transport continues to grow, driven by global and regional integration as well as urbanisation. Capacity development plays a critical role in addressing the many challenges facing the transport sector – from ensuring integrated planning to fostering inclusive and equitable human development in harmony with nature. However, to achieve meaningful and lasting impact, it is imperative to better understand the strengths and weaknesses of existing capacity development programmes, identify gaps, and tailor interventions to meet the evolving needs of transport professionals, city authorities, and other stakeholders.

To enable policymakers to take the necessary actions in building urgently needed implementation capacity, we require relevant data and the development of theories of change to achieve the desired outcomes. TUMI has taken a first step toward closing the information gap with a scenario developed as part of the TUMI 1.5°C Outlook, outlining a pathway towards decarbonization in line with the Paris Agreement and the 2030 Agenda.

With the UN Decade of Sustainable Transport 2026-2035 right ahead of us, further action is needed to continue paving a clear and measurable transformation path – backed by robust data – towards a post-fossil and sustainable transport sector. There remains significant uncertainty and only limited evidence on the impact of the capacity gap in the transport sector on the likelihood of achieving climate and sustainable development goals.

In this context, international organisations (many of which are supporting this study) are seeking the most effective ways to support partner governments in rapidly developing nations and emerging economies.

TUMI is building on the previous work of the international community engaged in capacity building for sustainable transport, particularly the recent study "Capacity Building in Sustainable Urban Mobility for Low Income Countries: Research on Demand and Success Factors for Future Supply," commissioned by UK International Development through its High Volume Transport Applied Research Programme.

With this publication, we aim to further strengthen evidence-based decision-making by policymakers and academic leaders, to systematically build the institutional, individual, and societal capacities required for a globally just transition of the transport sector towards climate neutrality.

Jens Giersdorf
Management Head TUMI

Mathias Merforth
Coordinator TUMI #MobilizeMinds

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List of Abbreviations

ASI-F	Avoid-Shift-Improve framework
AT	Active Travel
BALM	Federal Logistics and Mobility Office – Germany
BMZ	German Federal Ministry for Economic Cooperation and Development
BRT	Bus Rapid Transit
CEPT	Center for Environmental Planning and Technology – India
CPD	Continuous Professional Development
CTTU	Recife Urban Transit and Transport Authority – Brazil
EIA	Environmental Impact Assessment
ENERGIS	Center for Education and Raising Awareness on Energy Efficiency
GHG	Greenhouse Gas Emissions
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GSV	University of Transportation and Infrastructure – India
HIC	High-Income Country
HVT	High Volume Transport Applied Research
ICE	Internal Combustion Engine
ILO	International Labour Organisation
IMT	Mexican Transport Institute
IPN	Institute of Polytechnic Studies – Mexico
IRF	International Road Federation
KMRL	Kochi Metro Rail Limited – India
KTU	Karadeniz Technical University - Turkey
LAMATA	Lagos Metropolitan Area Transport Authority
LASU	Lagos State University
LMIC	Lower-Middle-Income Country
MIC	Middle-Income Country
MooCs	Massive Open Online Courses
NDCs	Nationally Determined Contributions
NIT	National Institute of Technology – India
PPP	Public-Private-Partnership
PT	Public Transport
RoI	Return on Investment
SDGs	Sustainable Development Goals
SPV	Special Purpose Vehicle
SUM	Sustainable Urban Mobility
SUMP	Sustainable Urban Mobility Plan
TfC	Transport for Cairo
TNA	Training Needs Assessment
TUMI	Transformative Urban Mobility Initiative
UADY	Universidad Autónoma de Yucatán – Mexico
UMIC	Upper-Middle-Income-Country
UNAM	National Autonomous University of Mexico
UNILAG	University of Lagos – Nigeria
UTM	Technological Metropolitan University – Mexico
YABATECH	Yaba College of Technology – Nigeria

1. Introduction

The transport sector accounts for roughly a quarter of energy-related Greenhouse Gas (GHG) emissions. (Teske, Niklas, & Langdon, 2021)[1] Bearing in mind the necessity to reduce forecasted global warming levels to 1.5 degrees Celsius by 2050, the transport sector must reach zero-emissions by 2050.

Using the Avoid-Shift-Improve framework (ASI-F), the TUMI Transport Outlook identified several pathways to enable the decarbonisation of the transport sector (Teske, Niklas, & Langdon, 2021):

1. Phasing out of internal combustion engines (ICE) by 2030,
2. Elevating walking and cycling,
3. Doubling the capacity of public transport by 2030,
4. Electrification of at least 70% of rail networks,
5. Prioritising electricity as the primary fuel for transport.

While these pathways set targets to decarbonise transport and guide governments in their investments and efforts, realising them depends on the available capacities, which in turn determines the chances of reaching climate and sustainable development goals.

Article 11 of the Paris Agreement stipulates that developed countries shall support developing countries in improving their ability and capacity to implement climate mitigation and adaptation measures. (UNFCCC, 2015) As such and within the framework of international development cooperation, capacity development[2] has been one of the corner stones of the technical assistance provided to partner countries by international organisations. Knowledge transfer, peer learning and capacity building are one of the action areas recommended to increase action and ambition in countries' upcoming Nationally Determined Contributions (NDCs). (SLOCAT, 2024)[3]

In the transport and mobility sector, which is a dynamic field with short innovation cycles, capacity building plays a critical role for transport institutions to be able to decarbonise the sector while responding to current challenges including urban sprawl and fluctuating investment towards sustainable mobility, where instead, road-centric infrastructure is often favoured. (Wagner & Weinmann, 2023)[4]

However, there is large uncertainty and only limited evidence available on the impact of the capacity gap in the transport sector, specifically on the probability of reaching climate and sustainable development targets. (Dalkmann & Platzer, 2020)[5] To address this research gap, the study aims to test the hypothesis that investing in capacities within transport institutions will have a positive impact on, i.e. increase the probability of, achieving transport decarbonisation goals.

1 Teske, S., Niklas, S., & Langdon, R. (2021). TUMI Transport Outlook 1.5C A global scenario to decarbonise transport. Retrieved from https://www.transformative-mobility.org/wp-content/uploads/2023/03/TUMI-Transport-Outlook-Sol1tB.pdf

2 Capacity building and capacity development shall be used interchangeably within the framework of this study.

3 SLOCAT. (2024). Action for ambition in Nationally Determined Contributions. Retrieved from https://slocat.net/wp-content/uploads/2024/09/Call2Action-NDC-Research-The-Commitment.pdf

4 Wagner, A., & Weinmann, V. (2023). Capacity and Institutional Support to Achieve Sustainable, Low Carbon Transport. Global Status Report on Transport, Climate and Sustainability – 3rd edition. Retrieved from www.tcc-gsr.com

5 Dalkmann, H., & Platzer, L. (2020). A 250k Gap? Building capacity for the global mobility transition scaling capacity and education to achieve sustainable mobility for all. Retrieved from https://www.transformative-mobility.org/wp-content/uploads/2023/03/TUMI_2020_250k_gap.-Building_capacity_global_mobility_transition_Feb2021-C1cy8B.pdf

2. Overview: Capacity Development

The UN defines capacity as the "ability of people, organisations and society as a whole to manage their affairs successfully" (UNDG, 2017). As such, capacity building, or more commonly referred to as capacity development, is a process by which stakeholders aim to improve their abilities to produce better outcomes. It implies conscious learning and change management. (UNDG, 2017)
To support countries to achieve their development goals, capacity development is commonly seen as one of the main elements pertaining to international development cooperation. (Mizrahi, 2004)
As such, capacity development support is defined as "efforts by external individuals or organisations to reinforce, facilitate, and catalyse capacity development". (UNDG, 2017)

2.1 The three levels of capacity development

As implied by the definition of capacity development, practicioners differentiate between three sub-levels or three approaches to developing capacities: Capacities can be improved on the individual level, the organisational (or institutional) level, and on the societal level. As demonstrated in the figure below, the focus and objectives behind each capacity level differ:

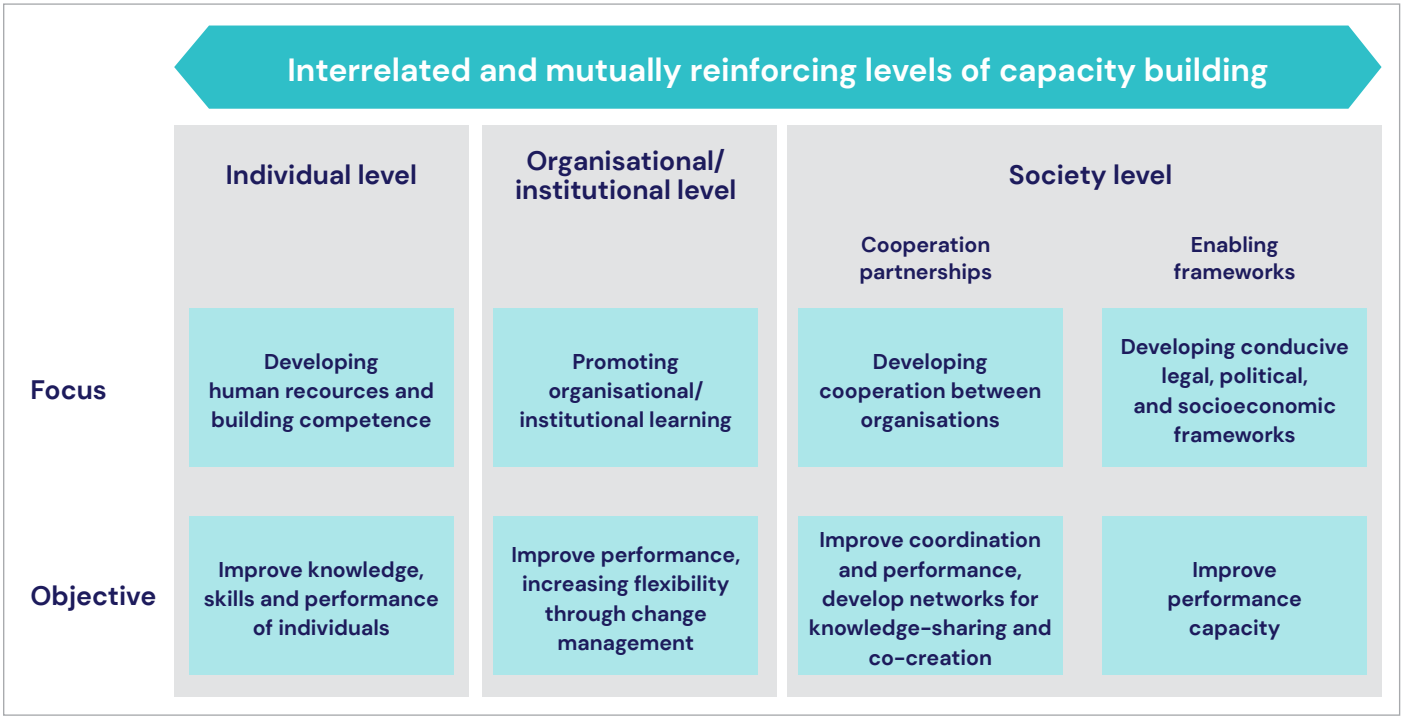

Figure 1: Levels of capacity development – Adapted from (Moawad & Abdul Aziz, 2024) based on (UNDG, 2017) and (GIZ, 2015)

The focus and objectives behind each capacity level differ:

On the individual level, the capacity development efforts focus on developing human resources by improving the knowledge, skills and performance of individuals. This implies improving the educational background and/or technical expertise of both existing and future employees. Capacity gaps on the individual level are further categorised into the gap in the number of staff, the gap in education of staff, the gap in existing educational programmes, and the gap in including sustainability in educational programmes. (Dalkmann & Platzer, 2020)

Table 1: Capacity gaps on the individual level – adapted from (Moawad & Abdul Aziz, 2024)[6] based on (Dalkmann & Platzer, 2020)

Capacity gaps on the individual level	Explanation
Gap in the number of staff	The number of existing staff members does not correspond to the organisation/institution's needs.
Gap in education of staff	The educational and technical background and skills of existing staff members does not correspond to the organisation/institution's needs.
Gap in educational programmes	The existing number and quality of academic and non-academic educational programmes available to existing and future staff members (students and potential recruits) within the city, state or country do not correspond to the needs of the organisation/institution.
Gap in sustainability in educational programmes	The existing educational programmes within the city, state or country do not focus sufficiently on sustainability and hence do not correspond to the needs of the organisation/institution.

On the institutional level, capacity development efforts focus on institutional learning and change management to improve the performance and flexibility of entities. Capacity gaps on the institutional level are categorised into three sub-capacities: gaps in governance capacity, technical capacity and planning capacity.

Table 2: Capacity gaps on the institutional level - adapted from (Moawad & Abdul Aziz, 2024) based on (Hook & Hughes, 2016)

Capacity gaps on the institutional level	Explanation
Governance capacity gap	The difference between the existing and desired extent of an institution of having a clear legal and political authority to plan, design, finance and implement projects.
Planning capacity gap	The difference between the existing and desired extent of an institution of having proper systems and processes in place to plan and facilitate projects efficiently and effectively. This includes the presence of well-established plans.
Technical capacity gap	The difference between the existing and desired experience level of an institution in planning and implementing high-quality, well-designed projects without major delays.

Finally, **on the societal level,** capacity development efforts can focus on developing cooperation partnerships and/or developing legal, political and socio-economic frameworks, an enabling environment, that may support and enable institutions to work more smoothly. While cooperation partnerships can facilitate inter-organisational coordination and knowledge exchange, the enabling environment can improve the performance capability of transport institutions by providing supportive mandates and laws, political leadership and support as well as supportive public opinion and citizen engagement. Thus, two gaps may be attributed to the societal level: a gap in cooperation frameworks and the lack of an enabling environment.

6 Moawad, F., & Abdul Aziz, G. (2024). Capacity building in sustainable urban mobility for low income countries: research on demand and success factors for future supply. Transport for Cairo & UKAid High Volume Transport Applied Research Programme. Retrieved from https://transport-links.com/hvt-publications/capacity-building-in-sustainable-urban-mobility-for-low-income-countries-research-on-demand-and-success-factors-for-future-supply

Table 3: Capacity gaps on the societal level - adapted from (Moawad & Abdul Aziz, 2024) based on (GIZ, 2015)

Capacity gaps on the societal level	Explanation
Gap in cooperation partnerships	The level of cooperation between organisations and institutions, both horizontally and vertically, to establish and develop networks for knowledge-sharing and co-creation is not sufficiently developed and implemented.
Lack of an enabling environment	The difference between the existing and desired quality of legal, political, and socio-economic frameworks.

2.2. Technical and functional capacities

Further, literature about capacity and capacity building distinguish between technical and functional capacities. On the one hand, technical capacities refer to sector-specific knowledge and skills, such as know-how regarding Sustainable Urban Mobility Plans (SUMPs) or operation and maintenance of different transport modes etc. On the other hand, functional capacities refer to knowledge and skills, which can be applied across different sectors and industries. Examples include knowledge and skills related to project management, procurement, human resources, marketing etc. (UNDG, 2017) *Table 4* demonstrates how such functional capacities can take shape.

Table 4: Overview of functional skills performed in urban transport

Functional skills	Role in urban transport
Human resources management	Human Resource Management (HRM) oversees both the workforce and the policies that govern their employment, development, and well-being within the instituiton. It ensures that employees align with institutional goals through workforce planning, recruitment, training, and retention.
Marketing and communication	All external communications by transport institutions, targeting citizens, government and non-government partners, and potential suppliers. This includes public notices, passenger information, requests for proposals, and community engagement efforts such as awareness campaigns and participatory activities. Marketing and communication channels range from direct methods like emails and phone calls to indirect ones such as websites, social media, and public events.
Procurement	The process of acquiring goods and services whether through public tenders or direct commission. Procurement skills also include those related to drafting, monitoring and evaluating the terms of references, service level agreements, negotiating budgets, etc.
Project management	Planning, coordination, execution, and monitoring of urban mobility measures and infrastructure projects.

3. Approach

We approached this study with the central objective of assessing the extent to which investment in capacity building supports the implementation of climate and sustainable transport goals. We explored this research gap by designing a questionnaire that addresses the sub-levels of capacity building: individual, institutional, and societal capacities.

The questionnaire investigates key areas in transport institutions in the selected cities: What progress has been made toward transport decarbonisation targets? How do workforce size, staff gaps, and recruitment or retention strategies influence sustainable mobility outcomes? What types of educational programmes are available, and how strongly do they include sustainable transport? The questionnaire also examines institutional governance and planning capacities, societal collaboration and supportive frameworks. Furthermore, the questionnaire asks respondents for insights on their preferred formats for capacity development and the factors influencing these preferences.

Finally, the questionnaire asks respondents about impact assessments, and how they measure changes resulting from capacity building efforts across the different sub-levels.

3.1. Participating transport institutions

To produce an evidence-based narrative exploring, establishing and reinforcing the positive relationship between capacity building and sustainable transport, global participation is a key requirement. Our approach relied on contacting transport institutions, i.e. transport authorities, special purpose vehicles (SPVs)[7], and

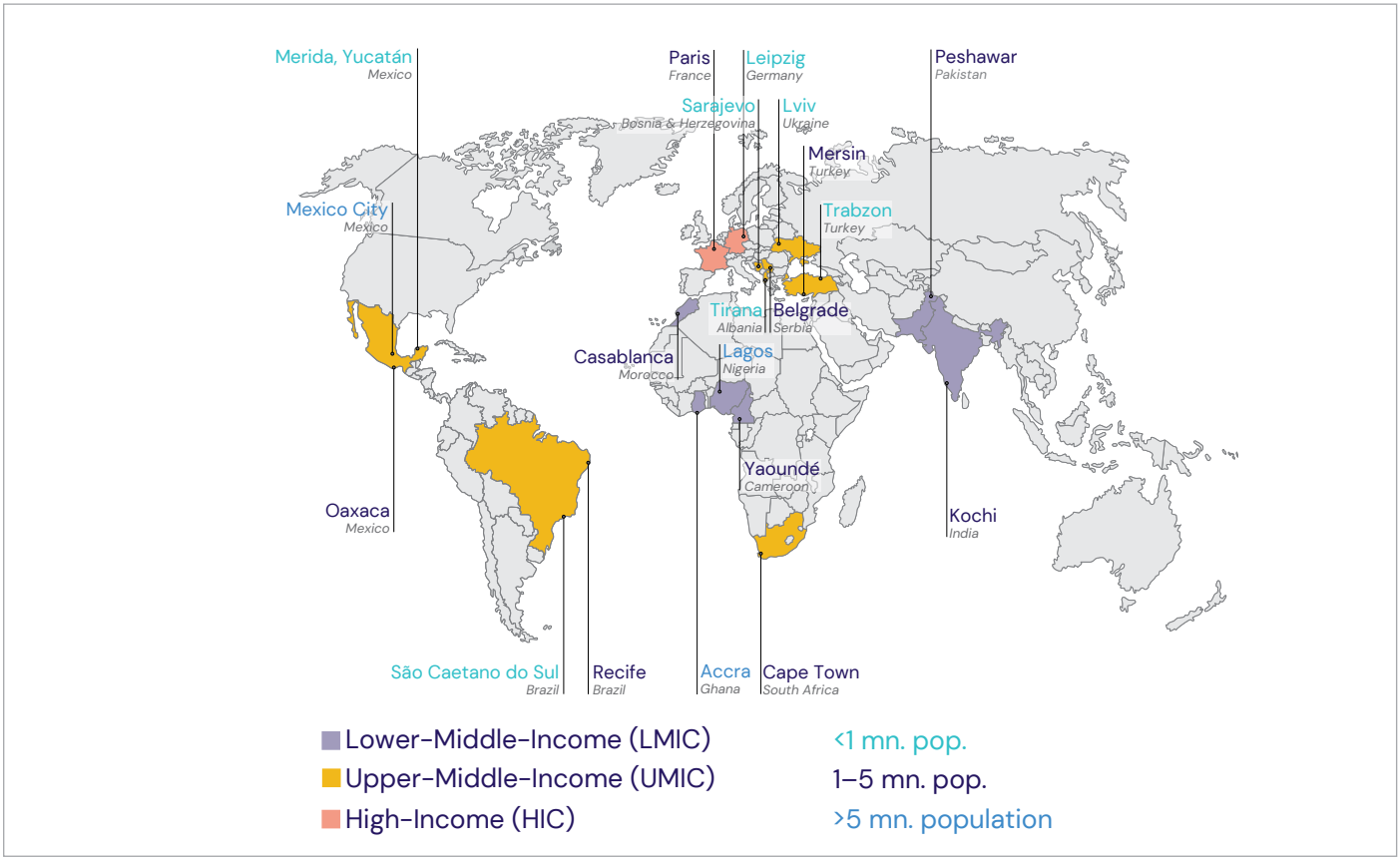

Figure 2: Representation of cities which participated in the questionnaire

7 Government authorities sometimes establish special purpose vehicles (SPVs) to oversee contractual agreements with private operators. These authorities manage transport services, and this arrangement reduces financial risk on the authorities they are affiliated to. (UITP, 2020)

operatorson the city and state[8] levels, who represent countries in different regions, and with different income levels and population sizes.

In total, 21 transport institutions from 20 cities across 16 countries participated in the study.[9] Their categorisation according to city size, income level and region is illustrated in *Figure 2*. A detailed overview of the cities can be found in the annex *11.1.4.*

More information on the methodology, questionnaire design, city selection criteria and the data collection process are available in the annex *11.1.*

8 In the context of this study, a state level authority refers not to a national level authority, but to a sub-national one responsible for one of the country's administrative states, regions, federations etc.

9 The total number of responses received were 21, however, with two respondents representing the same geographic context (Merida on the city level and Yucatán on the state level)

4. Individual level capacities

The United Nations Development Group (UNDG) defines capacity assessment as the analysis of desired capacities against existing capacities to understand capacity needs. (UNDG, 2008) This concept of assessing current capacities against future needs influenced the design of several questions in the data collection questionnaire.

4.1. The staff gap

The *TUMI report "A 250k gap? Building capacity for the global mobility transition"* recommends understanding the workforce demand by defining the existing staff involved in creating, managing and operating transport systems. (Dalkmann & Platzer, 2020) In the questionnaire, we ask transport institutions to include the existing number and desired, i.e. needed, number of staff in departments related to urban mobility such as procurement, regulation, marketing and customer management, operations and maintenance, planning, budgeting, and construction. This information is used to measure the capacity gaps across different departments.

The data shows, that across all transport institutions, a significant workforce shortage is visible, with transport institutions reporting the need for more than double their current number of staff across different departments.

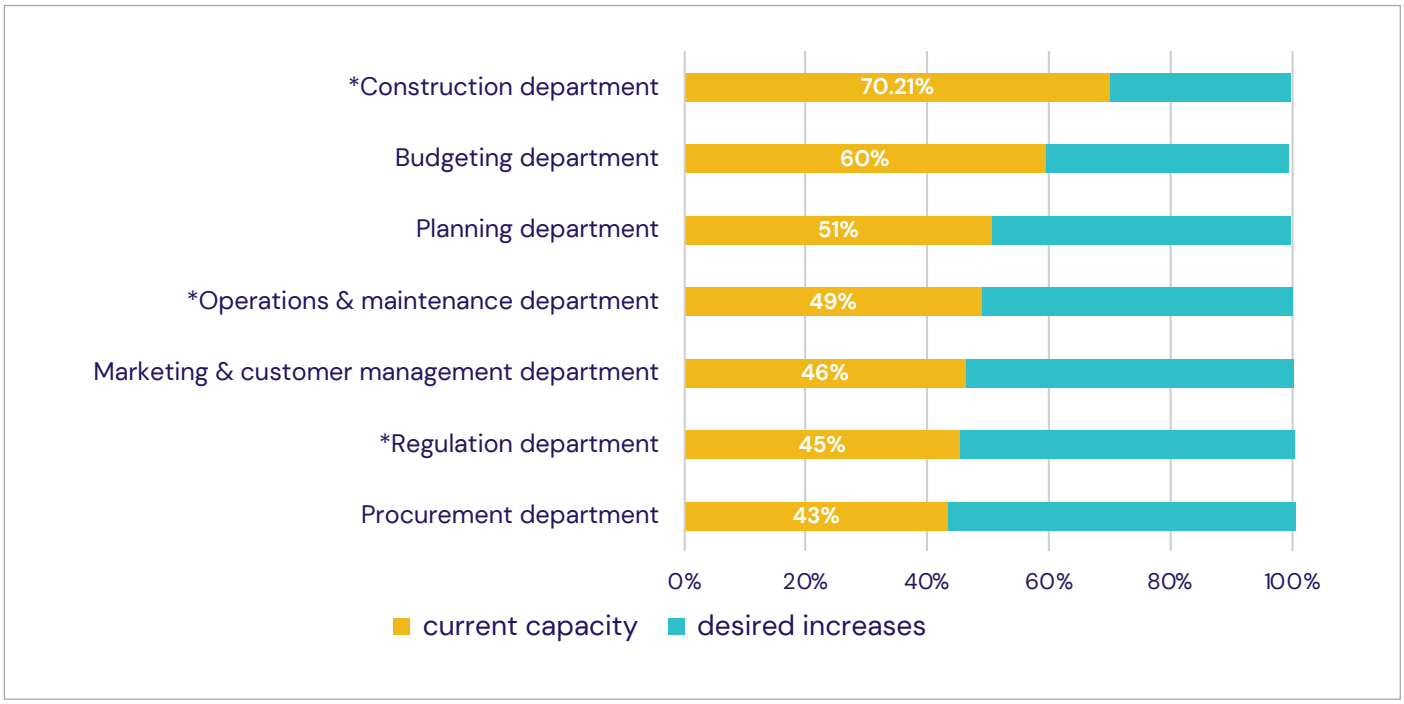

Figure 3: Staff gaps across technical (starred) and functional capacities (not starred)

Thus, the questionnaire findings confirm the argument other studies have made regarding the significant scarcity of qualified specialists with a comprehensive understanding of transport. (Kumar & Agarwal, 2013)

After calculating the average values for each department, the results show that across all transport institutions the average highest percentage of capacity gaps is in the **procurement department (130%), regulation department (120%) and marketing and customer management department (116%).** This means that the procurement department has 43% of its desired human resources capacity, the regulation department has 45% of its desired staff, and marketing and customer management has 46%.

The current individual capacities gap includes not just a gap in technical expertise such as transport planning and regulation but is also pronounced in functional capacities such as procurement, marketing and budgeting.

UNDG categorises capacities into functional and technical capacities, the functional capacities are not specific to sectors, but serve common areas such as planning, budgeting, policymaking and communications. (UNDG, 2017)

Table 5: Average percentage increases of technical departments (starred) and functional departments (not starred) of all transport institutions

Department	% of increase
Procurement department	130%
Regulation department*	120%
Marketing & customer management department	116%
Operations & maintenance department *	104%
Planning department	97%
Budgeting department	68%
Construction department*	42%

The responses show that transport institutions typically recruit employees with technical backgrounds such as urban planning, and road engineering, but the open-ended answers reveal that beyond the technical kills, administrative skills are also strongly needed, along with vocational skills such as electrical works.

As the question was a closed one, respondents filled in their current and desired capacities in the different departments listed in *Table 5*. Therefore, no further explanations were received from the respondents on the gaps, or why they specified these increases. Therefore, we tried making a few assumptions as to why certain departments had evidently big gaps. Some general findings are observed across the results:

Staff gap in the procurement departments

The staff gaps in the procurement department remain the highest in small cities (e.g. in Sarajevo, Tirana Lviv, São Caetano do Sul and Merida), in Upper-Middle-Income (UMIC) cities (e.g. in Cape Town, Belgrade, Mersin), and in European cities (e.g. in Leipzig, Trabzon, Paris).

As defined in *Table 4*, procurement involves acquiring goods, services, or works from external suppliers, such as purchasing new buses through a tendering process. These staff gaps may suggest that a portion of transport services are provided through third-party agreements, with institutions overseeing and regulating these processes.

Procurement and outsourcing are related concepts in business operations, but they have distinct meanings: While procurement referns to the general process of acquiring goods and services externally, outsourcing implies that the institution contracts an external third-party provider to perform specific processes or functions, which were previously performed in-house by the institution's employees. In the study, Cape Town, for example, expressed its desire in outsourcing its institution's marketing and customer management functions.

Staff gap in the regulation, operations and maintenance departments

Staff gaps in the regulation department are the second highest at 120%, while operations and maintenance departments reveal the fourth highest gap at 104%.

While transport authorities are primarily responsible for regulating transport services, the operational and maintenance functions vary across different cities. Some authorities directly manage and maintain transport services, while others rely on external public or private companies. In both cases, transport authorities need to employ staff to oversee the external operators and maintenance providers, ensuring effective service delivery and regulatory compliance.

Staff gaps in marketing and communication departments (promotional functions)

Across participating transport institutions, marketing and customer management departmens were among the top three with staff gaps. This department ranking shifts to the second or third rank when results are disaggregated by city size or income level. This shows that there is a need to address a gap in marketing capacities, which are concerned with shaping public opinion towards adopting sustainable transport services.

As defined in *Table 4*, marketing in urban transport plays a role in shaping and improving public opinion towards public transport, walking and cycling. This is achieved through launching transport-focused awareness campaigns and public events to introduce new services, or other promotional activites. (C40 Cities Climate Leadership Group, 2024) Marketing also includes communication functions targeting non-government partners and potential suppliers. This includes public announcements about changes in transport services, the provision of regularly updated and real-time passenger information systems, and the issuance of requests for proposals.

4.2. Hiring in transport

The transformation towards new green economies affects employment in four different ways: The creation of new jobs, the substitution and elimination of existing professions within the carbon-intensive sectors, and existing professions undergoing changes with new skills and profiles. (UNEP, ILO, IOE, & ITUC, 2008)

Filling these new jobs or adapting to new skills, requires training programmes and capacity development visions. The Green Jobs Report by the International Labour Organisation (ILO) reported a skills gap existing between workers' skills and the needs of the green industries. These new industries, which are built on advanced technologies, are widening the skills gaps. (UNEP, ILO, IOE, & ITUC, 2008)

To explore how transport institutions are responding to the current transport sector requirements, the questionnaire asks multiple questions to capture the capacities of existing and future staff including the backgrounds looked for in new recruits, the educational programmes offered related to transport and mobility, and to what degree sustainable mobility education is covered.

What are the profiles the transport institutions are looking to recruit?

The questionnaire results show that the most chosen background in new recruits focuses on technical specifications for transport: **transport engineering and urban planning**.

Transport engineering and urban planning are the two educational backgrounds most recruited by transport institutions.

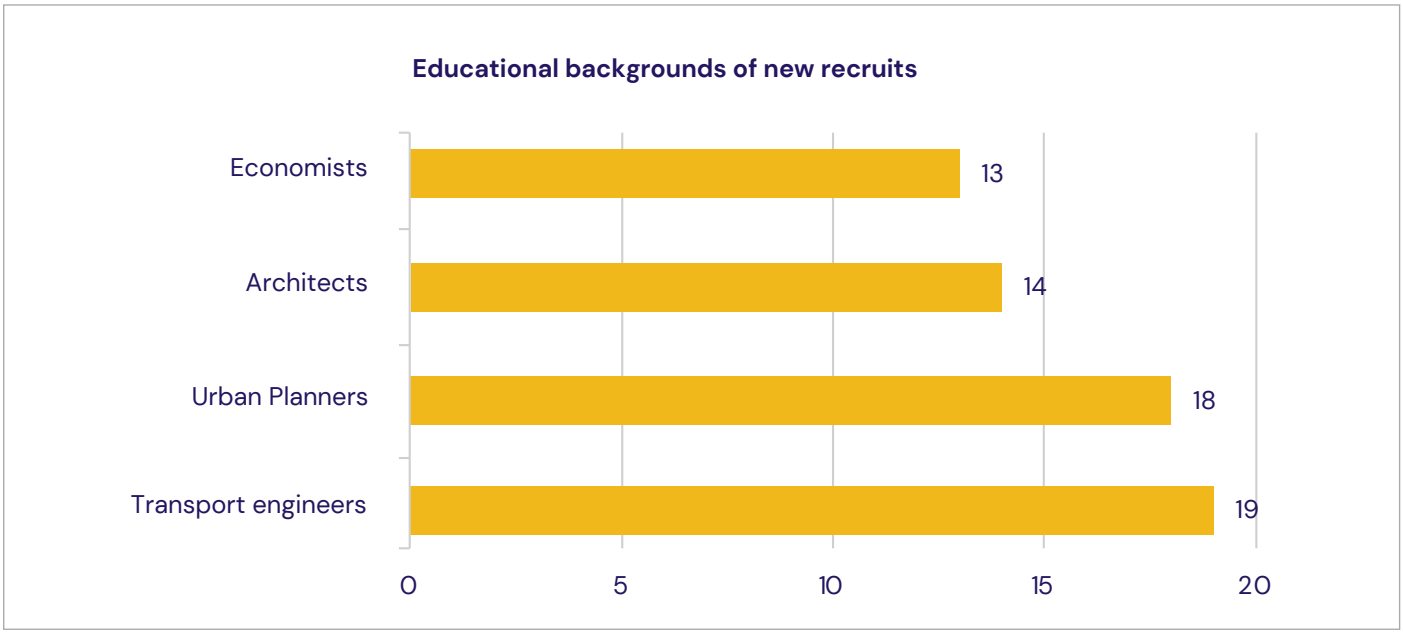

Figure 4: Number of instances each educational background was chosen by the 21 respondents

This finding is particularly significant, as the biggest staff gaps in transport institutions, as identified earlier, are in the procurement, regulation, and marketing and customer management departments. Therefore, the results **highlight the need to prioritise hiring business, legal, and marketing professionals rather than focusing solely on transport engineers and urban planners.**

Beyond the initial identification, coding the open-ended answers from Leipzig, Mexico, Yaoundé, Kochi, Accra, Tirana, Casablanca and Mersin, revealed additional educational backgrounds listed below.

Table 6: Additonal backgrounds identified by transport institutions

Additional backgrounds identified	Reference transport institutions	(No. /8)[10]
Administrative skills	Accra, Casablanca, Leipzig	3
Electrical works	Accra, Kochi, Leipzig	3
Legislative backgrounds	Tirana, Yaoundé	2
Marketing	Casablanca	1
Tendering and procurement	Mersin	1
Policy-making	Mexico	1
Quantity surveying	Accra	1

4.3. Strategies to attract and retain staff in transport

Research conducted by the International Transport Workders' Federation (ITF) showed that investment in sustainable public transport would create new jobs[11], but while many of these jobs are created in parallel with introducing new technologies, many jobs are also lost. (Dobrusin, 2022) Therefore, capacity building at its core, is a strategy to ensure people are not left behind in the transition to new sustainable systems. The strategy must also be examined through the lens of just transition principles as outlined by the ITF.

This includes:

- procedural justice: ensuring all affected stakeholders have a voice in decision-making;
- distributive justice: prioritising benefits for those who have historically had the least;
- recognition justice: creating space for groups previously excluded from transport planning and policy; and
- restorative justice: addressing past injustices through reparative measures. (Dobrusin, 2022)

Attracting and retaining quality employees impacts performance by matching employees' profiles to the operational needs of an organisation. (ILO, 2021) To obtain insights on how institutions attract new recruits and how they retain existing staff, the questionnaire included two separate open-ended questions to gather insights on strategies and measures to address these.

4.3.1. Strategies to attract and recruit new staff

Responses to this open-ended question on staff attraction strategies indicate there was a potential mix of interpretations. Out of the valid responses received for this question, most transport institutions interpret it by mentioning specific strategies that they use to attract skilled staff, while others focused their answers on their procedural recruitment process, and others mentioned both. *Table 7* aggregates these response types and the number of transport institutions that provided them.

10 Eight out of the 21 respondents provided open-ended answers related to other fields they look for in new recruits.

11 The research conducted by the ITF in five global cities showed that increased investment in public transport to achieve the 1.5 degree goal would create 650,000 new jobs in each city, and 650,000 globally. (Dobrusin, 2022)

Table 7: Types of responses recieved on strategies to attract and hire new staff

Responses type	(No. /21)
Strategies to attract staff and details on the recruitment process	13
Strategies to attract staff *only*	9
Recruitment process *only*	5
No strategies in place	3

Recruitment process

According to the ILO, the recruitment process includes systems and practices to hire new candidates and is defined as the methods and strategies an organisation uses to identify and attract potential employees. (ILO, 2021) While most of the transport institutions focused on attraction strategies, nine respondents (out of 21) also mentioned recruitments channels. The answers received pertaining to the recruitment process were analysed based on the channels, assessment criteria, recruiting entity, recruitment policies and the type of recruitment sourcing the responses from the transport institutions implied.

Table 8: Categorisation of the responses on the recruitment of new hires

Response type	Description	(No. /9)
What **channels** are used to recruit new staff?	Platforms to announce the need for new recruits	5
How do they select/**assess** candidates?	Assessment or evaluation process such as interviews and competency testing	3
Who **manages** the recruitment process?	The department handling the recruitment of new staff (HR department)	3
What **policies** shape the recruitment?	Mandates affecting the recruitment of new hires, such as the civil service law	2
What is the **type of recruitment sourcing**[12]?	Recruiting/hiring empolyees via public or internal hiring calls or via direct recruitment.	2

Most of the transport institutions mentioned channels to recruit new staff such as job fairs, social media campaigns or arranging internships.

> *"Participating in job fairs and internship programs to attract specialized talent in fields such as engineering, architecture, and economics." (Merida)*

A smaller number of transport institutions detailed their evaluation processes such as the sequence of interviews conducted with candidates and the tests arranged to measure their competencies.

12 The ILO specifies four types of recruitment sourcing: internal recruitment, external recruitment, social media recruitment and recruitment outsourcing. (ILO, 2021)

"The selection process for each position within the Secretary of Mobility is conducted through the opening of a public call, allowing any qualified profile to participate. Once the profiles have been received, those best suited for the position are selected and technical tests are administered to evaluate them. Finally, personalized interviews are conducted with the finalist profiles to assess their aptitudes and qualities, and the final candidate is chosen." (Mexico City)

The few responses which mentioned details on the recruitment process also revealed that recruitment is typically managed by the Human Resources (HR) department or an in-house recruitment unit within the institution. In some cases, hiring follows central government policies, such as Ghana's Local Government Service framework, while in others, it is conducted through multi-stage interview processes, or procedures aligned with civil service laws. So, recruitment is often not within the direct purview of transport departments.

Attraction strategies

Responses received to the open-ended question yielded four different areas, which transport institutions work on to attract skilled personnel, as demonstrated in the figure below.

Figure 5: Types of strategies mentioned by the respondents to attract skilled staff

1. **Professional development and growth** were the most widely mentioned strategy across responses, mentioned by eight transport institutions (out of 13). This takes different forms such as career advancement and continuous learning opportunities.

    - *Career advancement opportunities* include promotions and providing clear pathways for career growth within positions.
    - *Continuous learning opportunities* include partnerships with local and national academic institutions, and research centres, or provision of trainings and supporting employees in attending courses in their field of work.

"The agency collaborates with local and national academic institutions through partnerships with universities and research centers […]." (Merida)

Most transport institutions adopt learning opportunities as incentives to attract new hires. This reflects that respondents position their workplaces as environments where employees can learn, develop and apply these learnings within their practises.

2. **Compensation, benefits and recognition** is the second most adopted strategy by transport institutions for attracting new staff members (equally as often as workplace culture strategies). The ILO breaks down compensation packages into five types: base pay, variable pay, bonuses, incentives, and benefits. (ILO, 2023) This includes offering competitive remuneration systems (financial rewards) and different types of benefits (non-financial rewards). Most of the benefits mentioned by the transport institutions included a mix of these compensation types such as attractive health insurance plans, social packages and pension schemes. One of the transport institutions mentioned that their job offers entail permanent high-paying positions, and this confirms that job security can be a factor that attracts new recruits into public service positions.

"Market Based Salary" (Peshawar)

"Our attractive remuneration and benfit structures help us attract the right calibre candidates." (Cape Town)

3. **Workplace culture and flexibility** are strategies related to the characteristics of the work environment such as work-from-home settings, promoting staff diversity or promoting collaboration with experts and teamwork. These strategies, which are mentioned by six respondents (out of 13) contribute to the well-being of the employees and addressing their needs.

"LAMATA actively promotes diversity in its workforce, reflected in initiatives like the SHE CAN Tool that encourages gender inclusion across all transport operations" (Lagos)

"We provide flexible working conditions and encourage teamwork and collaboration with international experts" (Sarajevo)

4. **Purpose-driven work and engagement** are related to the institutions' themes of work and their mandates and values and are mentioned by five respondents (out of 13). This strategy is usually a result of the way the institution brands itself and its projects. The transport institutions mention that they work on "pioneering projects" or that they are known for their "operational efficiency". This contributes to an institution's reputation and branding as a desirable workplace for experts. These responses reveal that transport institutions attract personnel with both career prospects and the opportunity of being involved in new, transformative projects.

Offering the chance to work on pioneering projects in electromobility, transportation infrastructure, and decarbonization, the agency draws experienced professionals who are eager to contribute to socially and environmentally significant initiatives." (Merida)

"The possibility to implement own projects, be a part of big important projects." (Lviv)

Facilitating capacity building opportunities, enabling growth in employees' career paths, different compensation and benefits packages, and the institutions transformative projects act as both attraction and retention strategies for skilled staff.

4.3.2. Staff retention strategies

The majority of respondents[13] had strategies to retain skilled staff, however, four respondents had no retention strategies in place. Two of these transport institutions indicated that this is a challenge for them, pointing to the need for structured approaches to better retain their skilled workforce.

Figure 6: Types of strategies mentioned by the respondents to retain skilled staff

"Skilled staff have left the Department because of internal challenges to meet resource needs for [the] effective running of the Department's functions." (Accra)

"Human resources are trying to find a strategy. This is a huge challenge for us." (Paris)

1. Similar to the attraction strategies, **professional development and growth** was the most widely mentioned strategy among the retention strategies, thirteen respondents prioritise career advancement opportunities, continuous learning, mentorship, and exposure to challenging projects as key components of their retention strategies. This reflects the importance of aligning employees' responsibilities with their professional aspirations to ensure long-term commitment.

"Different study courses, possibility to go on business trips, visit forums, study tours." (Lviv)

"Training and a career development plan" (Casablanca)

2. **Purpose-driven work and engagement** was the second most mentioned strategy. When employees feel that their work contributes to a larger purpose (public good), they are more motivated to remain committed over time. This result shows that purpose-driven work has a stronger impact on retaining staff, than it has on attracting them.

"KMRL also provides an opportunity for staff to work in high-visibility and impact projects." (Kochi)

13 17 out of 21 respondents mentioned different retention strategies.

"Granting opportunities to work on interesting and challenging projects for public good (higher purpose) also aids retention of staff." (Cape Town)

3. **Workplace culture and flexibility** was another important retention strategy. Respondents identified the importance of creating a positive, innovative, and flexible work environment. This strategy approach encourages creativity, collaboration, and work-life balance, which are important to today's workforce.

"To ensure job retention, we offer remote work options." (Oaxaca)

"Flexible working conditions, including the possibility of remote work and a balanced workload, are also key factors that contribute to employee satisfaction and long-term retention." (Sarajevo)

4. Seven respondents list **compensation, benefits and recognition** programmes to acknowledge employee efforts. While this is not the most widely mentioned strategy, such programmes remain an important and direct approach in ensuring staff satisfaction and retention.

"Increase salaries" (Yaoundé)

"The agency retains skilled staff members by promoting a culture of recognition and appreciation." (Merida)

The responses show that most transport institutions use a mix of retention strategies, with most of them prioritising professional growth opportunities and promoting a sense of purpose at work. **This combined focus on professional development & growth as well as purpose-driven work and engagement highlights the focus on core motivators, supported by competitive compensation and a flexible workplace culture, as drivers in retaining skilled personnel in the transport sector.**

The absence of retention strategies can result in a high turnover of skilled staff, which can impact the performance of transport departments. Being part of an institution that encourages learning and growth and works on purpose-driven projects has a strong impact on retaining skilled staff.

4.4. Existing educational background of staff

The previous sections discussed numeric aspects of staff gaps, confirming that the number of staff needs to be doubled. But looking back at the results in *Figure 10*, the educational programmes focused on sustainbility presented a bigger capacity gap than the number of staff. This comes in parallel with a high-rated importance of staff education.

The educational gap is assessed through multiple questions, the first question inquires about the different programmes provided in the city, state and/or country related to transport and mobility. The responses have been summarised and listed in the annex *11.4.1.*

The responses are analysed based on the provider type (academic and non-academic providers) and another analysis is performed based on the thematic discipline of the programmes to explore to what degree sustainable transport is included.

4.4.1. Types of programmes

Most transport institutions gave examples of different programmes which include undergraduate, graduate and executive programmes. Yet, some transport institutions also provided examples of non-academic training facilities, government training institutions, or research centers, which provide courses, trainings, seminars, or workshops on specialised topics.

While university degrees offer a foundational understanding of transport, it is mainly training and research centres who provide more specialised educational programmes related to transport decarbonisation.

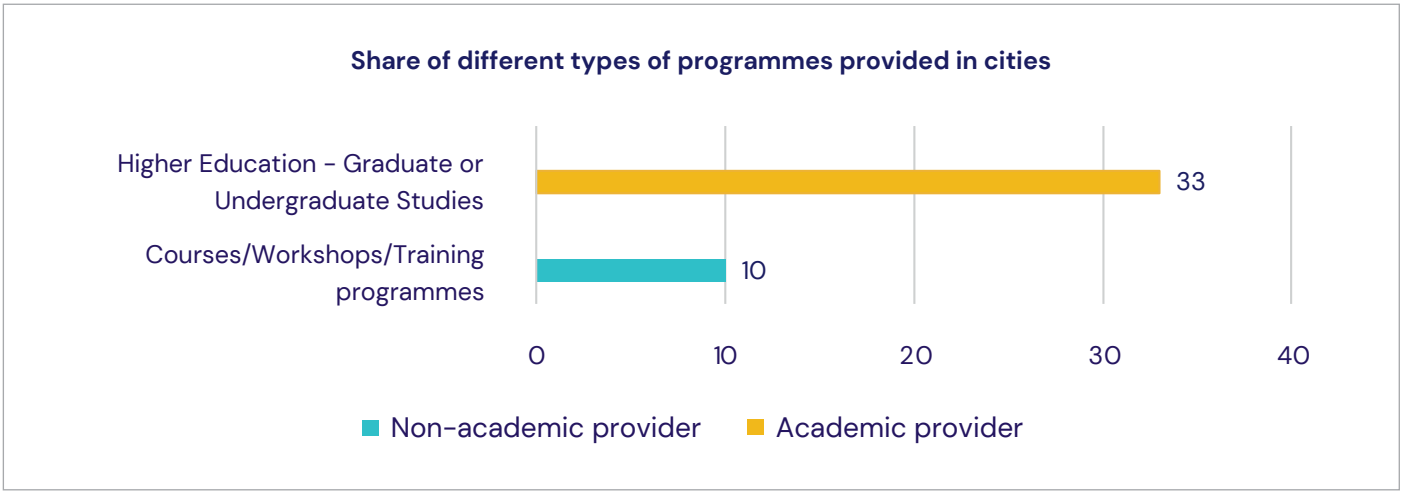

Figure 7: Share of different types of programmes provided by cities

Out of the ten examples mentioned by respondents regarding non-academic programmes (indicated in tuerquoise in *Figure 7*), eight of them focus on sustainable mobility practices. Some non-academic programmes mentioned include:

- The Center for Education and Raising Awareness on Energy Efficiency (ENERGIS) in Sarajevo provides workshops and seminars on sustainable urban mobility planning and integrating electric vehicles.
- The Association for Economic Development (REDAH) in Sarajevo includes some content on the development and implementation of sustainable transport systems.
- The Ochenuel Mobility Partnership organises the annual Sustainable Urban Mobility (SUM) Course with LAMATA.
- The Green Council in Sarajevo, a non-governmental organisation, provides content on decarbonisation and active travel infrastructure. The Turkish Ministry of Transport and Infrastructure provides technical and management training for government officials.

4.4.2. Thematic discipline of programmes

Despite the solid foundation educational programmes offer in transport engineering, architecture and urban planning, there is a strong gap in offering specialised programmes related to sustainable mobility in higher education programmes.

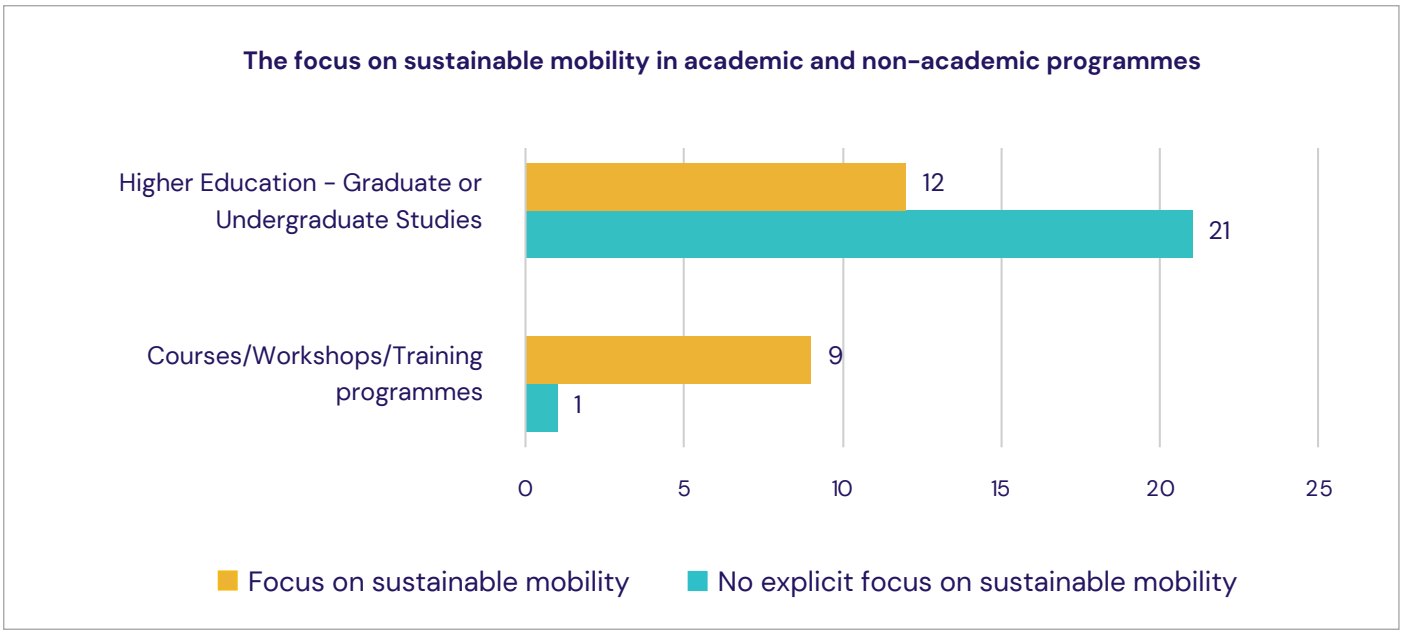

Figure 8: Sustainable mobility in higher education programmes provided by universities compared to courses provided by training or research centers

Figure 8 shows that most higher education programmes provided in the responses do not offer an explicit focus on sustainable mobility practices. While short courses, trainings or workshops provided by non-academic providers offer materials, which focus on sustainable mobility practices as presented in the last section.

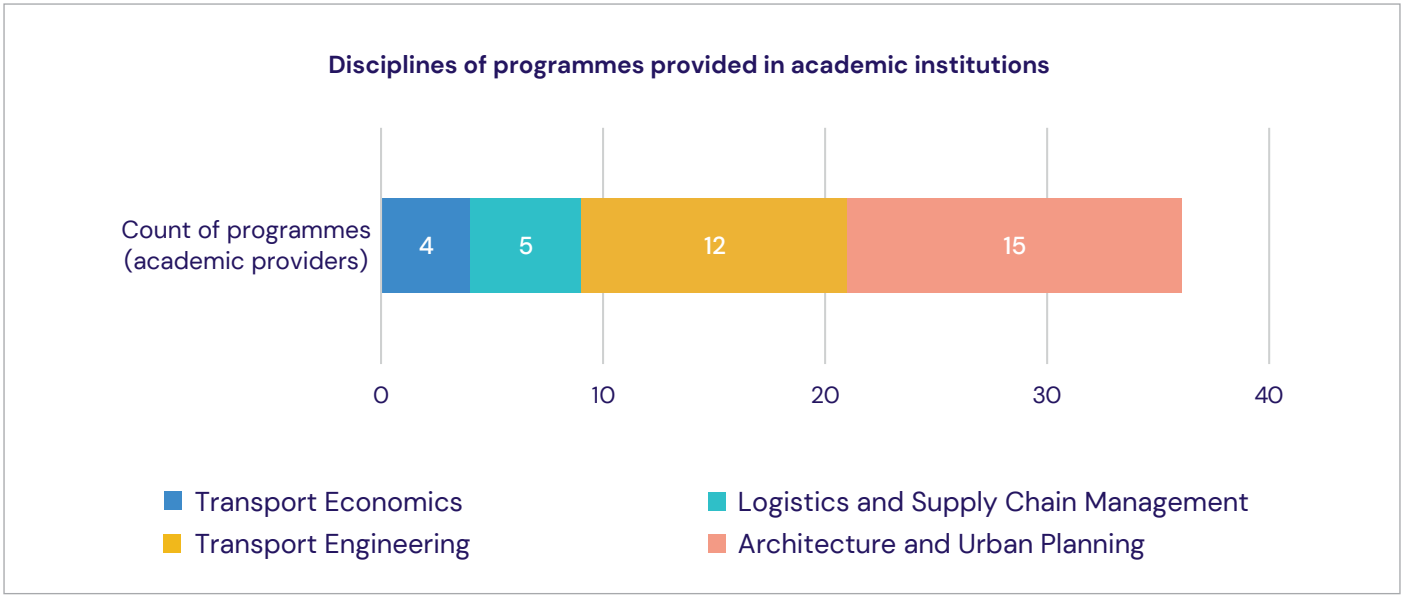

Figure 9: Disciplines of porogrammes provided in academic institutions

The disciplines in *Figure 9* are extracted from the list of academic programmes and is not exhaustive of the disciplines available in the participating cities, but it gives an impression of the available programmes that provide education for the local transport workforce.

- **Transport economics:** This field examines the economic principles that influence transport systems, including pricing, demand analysis, policy-making, and the financial sustainability of transport networks. The Universities of Cape Town and Stellenbosch provide courses in transport economics.
- **Logistics and Supply Chain Management:** This field focuses on the efficient movement of goods, services, and information across supply chains. The Albanian Institute of Business in Tirana offers an Executive Programme in Logistics and Supply Chain Management.
- **Transport engineering:** A discipline that deals with the design, operation, and infrastructures of transport systems, including roads, railways, and traffic management. Karadeniz Technical University (KTU) in Trabzon offers a Transportation Engineering Specialisation, covering transport planning, traffic engineering, and infrastructure design.
- **Architecture and Urban Planning:** A discipline that focuses on designing and developing urban spaces, integrating land use and transport. The Kharkiv School of Architecture at Ivan Franko National University in Lviv offers programs in Urbanism, Urban Planning, and Sustainable Spatial Development.

4.5. The importance of individual capacities for transport decarbonisation

The transport institutions were asked to evaluate the importance of each capacity within the individual capacity level.[14] **All capacities were evaluated as being important to very important for the achievement of transport decarbonisation.**

However, not all individual level capacities were seen to be equally important. For example, **number of staff** is rated as a less important factor to achieve sustainable transport compared to **staff education**.

For the purpose of transport decarbonisation, the educational background and skills of staff to perform functions are perceived to be more important than the number of staff performing these functions.

14 Respondents were asked to assess the importance on a scale from 1-5 where 5 was very high, 4 high, 3 moderately high, 2 low importance and 1 very low importance.

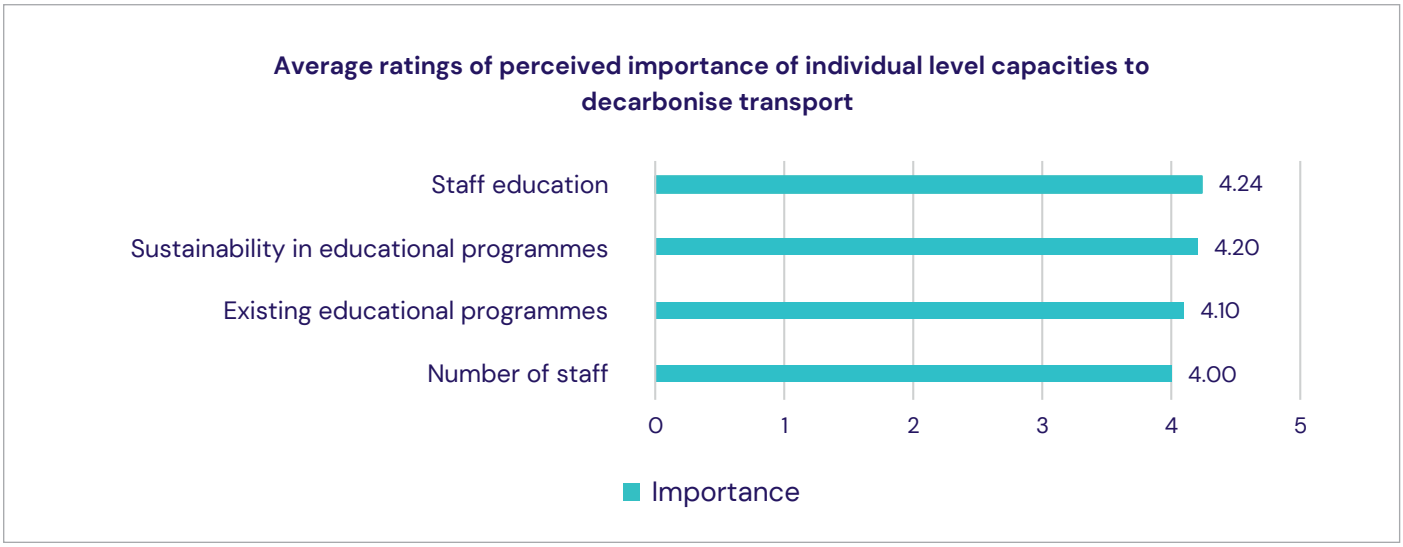

Figure 10: Importance of indvidual level capacities to decarbonise transport

Respondents were then asked to assess their insitution's current capacities on a scale from very high to very low. Interestingly, the results indicate that transport institutions assessed their current capacities on the individual level to be between moderate to low capacity.

The biggest capacity gaps between importance and current capacity on the individual level, are observed in the **educational programmes focused on sustainability** and in the **number of staff**.

There is a need to increase the amount and improve the quality of existing educational academic and non-academic programmes to cover sustainable mobility.

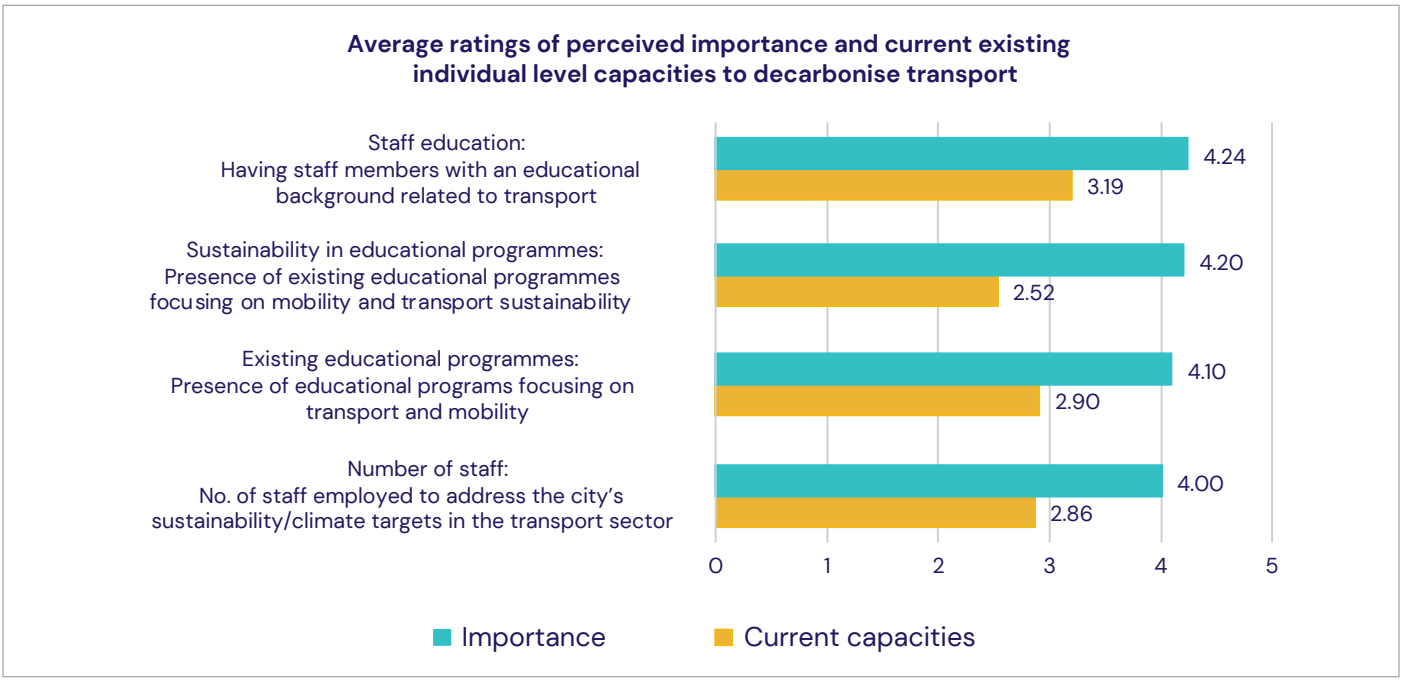

Figure 11: Average rating of perceived importance and existing individual level capacities to decarbonise transport

4.6. Sustainability within educational programmes

Sustainability within educational programmes is rated as a highly important capacity but has low existing capacity across the participating transport institutions.

While current programmes provide a solid foundational understanding of transport projects, there is a notable shortage of educational programmes especially focused on sustainable mobility, reflecting a considerable educational gap in sustainable mobility.

Among all the rated capacities, the most significant capacity gap lies in sustainable transport education programmes.

The responses from the transport institutions elaborated on factors contributing to increasing the sustainable education gap:

Gap between theory and practice

Outdated curricula in universities often increase or add to the gap between theory and practice. Among the responses to bridge this gap was encouraging the implementation of programmes that incorporate practical training (internships, fieldwork) through partnerships with the government on sustainable transport projects, and to prioritise research, which addresses local needs. (Tirana, Trabzon)

A good case study addressing this challenge can be found at the Lagos State University (LASU) School of Transport and Logistics, which is established in collaboration with the Lagos Metropolitan Area Transport Authority (LAMATA). This partnership exposes students to practical applications of sustainable practices, including public transport planning. (Lagos)

Lack of consideration of the interdisciplinarity of transport in study modules

This point can be observed in Sarajevo's and Cape Town's answers showing that despite the strong foundation that existing programmes provide, **there is a need for specialised training to address sustainability in transport systems**.

> *"While they provide an excellent qualification in transport planning or transport engineering, often the understanding of climate change mitigation and sustainability targets are superficial" (Cape Town)*

> *"The programmes provide a solid foundation in transport engineering and urban planning; however, there is often a gap in **specialized training** related to sustainable mobility, decarbonization, and the integration of advanced technologies such as electric vehicles and smart transport systems." (Sarajevo)*

Insufficient focus on new technologies

Only two of the transport institutions mentioned specialisation on transport technologies in study programmes (Kochi, Trabzon). This shows the currently limited focus on data-oriented analytical tools, or technologies related to understanding the financial, and technological needs for the transition towards and operation of electric vehicles.

Transport studies emerge from engineering disciplines

As illustrated in *4.4.2*, the majority of existing transport programmes focus on infrastructural aspects of transport (civil engineering, urban planning and traffic management) and fewer programmes focus on transport economics, finance and transport policy. (Accra, Trabzon)

These responses reflect this point:

> *"There is no pure study programme addressing mobility issues in the higher educational institutions of our city. We depend on personnel with backgrounds in urban planning or mechanical engineering." (Tirana)*

> *"The topic of sustainability is touched on very indirectly and depends more on the teacher's background, but the official program does not cover this at all. Urban planning and sustainable spatial development program cover the issue of sustainability much better, but this course focuses more on spatial planning than on mobility" (Lviv)*

The response from Tirana and Lviv both reveal that educational backgrounds are perceived to either contribute *directly* to urban mobility, or *indirectly*. Directly through programmes addressing sustainable urban mobility and focusing primarily on this scope, while indirectly through other disciplines such as urban planning, geography and in this case, urban mobility is dealt with indirectly through modules or specific courses.

Lack of climate and transport studies

Even if current modules offer a strong foundation for transport studies, there still exists an educational gap related to sustainable transport planning, infrastructural development for non-motorised transport, anad technical and policy studies to achieve the transition to electric and zero-emission vehicles etc. (Trabzon, Sarajevo)

5. Institutional level capacities

While literature confirms that there is "no single institutional model" suitable for all contexts (Kumar & Agarwal, 2013), several characteristics, i.e. the availability or lack of certain authorities and resources, can affect how well institutions can fulfil their mandates.

Based on the the findings of (Hook & Hughes, 2016), the study and questionnaire focused on three sub-capacities, namely transport governance, transport planning and technical capacity, to explore the institutional capacity of transport institutions. In the following, the main findings under each sub-capacity will be presented:

5.1. Transport governance

In the context of this study, the transport governance capacity refers to the transport institutions' ability and means to fulfil their mandate, which may include planning, designing, funding and implementing transport services and projects.

The questionnaire respondents were asked to explain in an open-ended question how the current governance structure in their city and/or country supports or hinders their organisation to plan, design, and implement transport projects related to sustainability and decarbonisation.

After coding the different responses, several enabling and hindering factors can be identified. Some respondents mentioned both supportive and hindering factors related to their current governance structure, while others only identified one or the other. Thus, the number of total responses per enabler and barrier differ.

The analysis below shall show that while some factors may serve as enablers in some cities (such as institutional autonomy), their lack may be interpreted as barriers in other contexts (lack of institutional autonomy).

Governance enablers

After analysing the 14 valid responses[15], the enabling factors mentioned in the results are listed below:

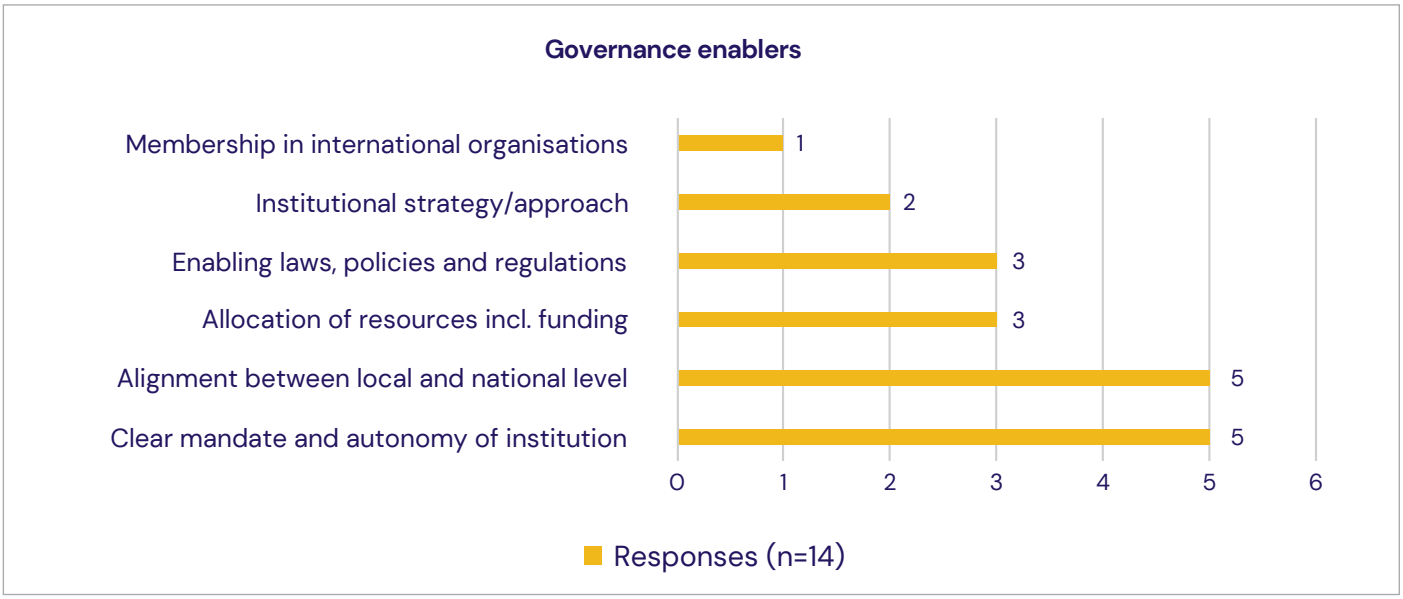

Figure 12: Governance enablers

15 7 out of 21 respondents either did not provide responses or their responses were invalid.

A clear mandate, autonomy, alignment and coordination between national and local agencies are transport institutons' main governance enablers.

Clear mandate and autonomy of (transport) institution

More than a third of respondents indicated, unsurprisingly, that having transport institutions with a clear mandate and autonomy was a significant enabler to their organisations' capacity to plan, design, and implement transport projects related to sustainability and decarbonisation. Responses varied whether the institution's mandate should cover the urban/metropolitan-level or the state-level. Practicioners recommend though that transport planning should be decentralised to ensure that services respond to the local context, needs and preferences of residents. (ITF, 2020)

> *"The current governance structure in Yucatán allows the Yucatán Transport Agency, as an autonomous body, to play a key role in planning, designing, and implementing transport projects focused on sustainability and decarbonization. This autonomy enables faster decision-making, as it is not directly subordinate to other governmental entities, allowing it to manage its own resources, set its priorities, and execute projects with greater flexibility." (Yucatán)*

Alignment and coordination between national and local agencies

Almost a third of respondents (5 out of 14) identified their institutions' activities and plans being aligned with national-level policies and priorities as well as receiving political support as another equally significant enabler . It was emphasised that these settings enable knowledge-sharing and technical assistance.

Allocation of resources including funding

Allocation of resources including funding for transport projects – whether on the local, regional, national or international level - has also been identified as a supportive factor.

Institutional strategy/approach

Two European transport institutions (Mersin and Tirana) identified that having a sustainability-oriented strategy or approach within their organisations supported their institutional capacity in carrying out projects.

Enabling laws, policies and regulations

Three transport institutions (Cape Town, Lagos and Tirana) mentioned the availability of supportive laws, policies and regulations as a supportive characteristic of the current governance structure.

> *"We have a Mobility Law that enhances effectiveness in sustainable transport by prioritizing pedestrians, cyclists, and public transport users." (Tirana)*

Other notable factors mentioned by single respondents were:

- Cooperation of local and national governments for knowledge sharing and technical assistance
- Membership in international organisations such as C40, as this may lead to the availability of technically qualified staff.

Governance barriers

9 out of 21 respondents were invalid or did not provide hindering factors bringing the total number of valid responses to 12. Most of the findings did not confirm trends specific to geographic location, city size or country income levels. The majority of identified barriers are shared by the different transport institutions.

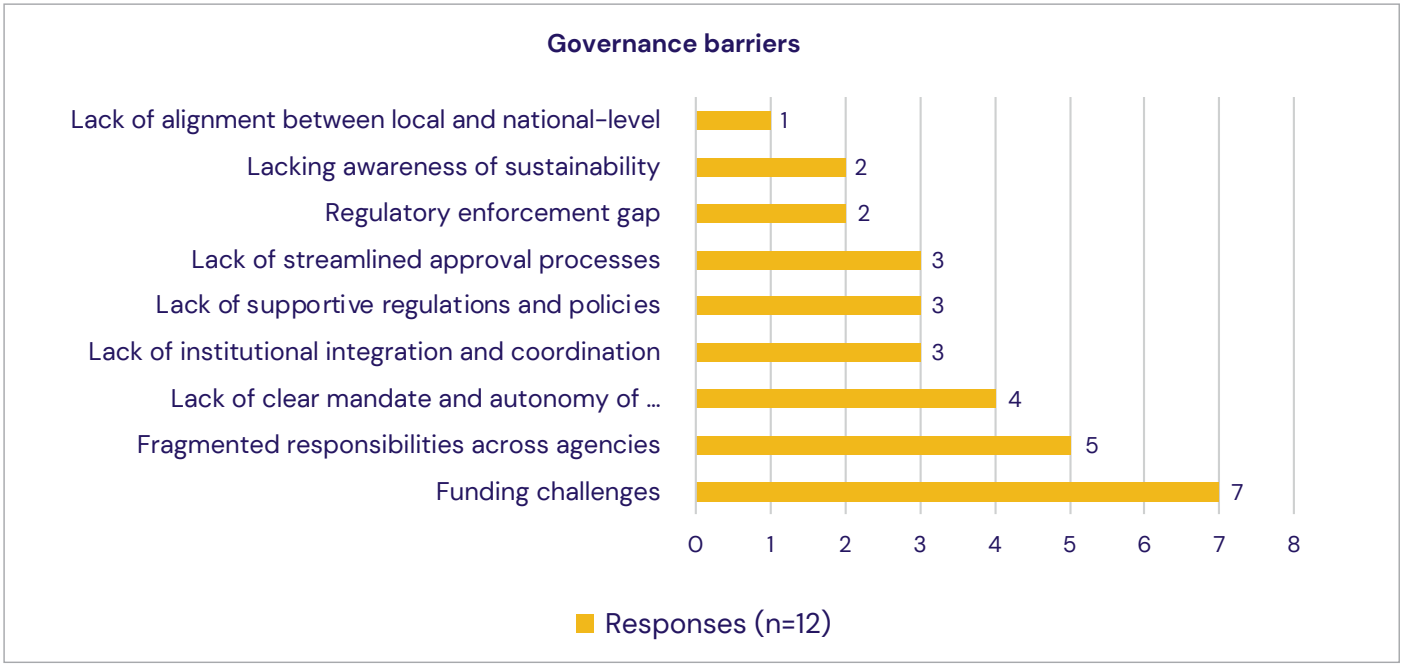

Figure 13: Governance barriers

Funding challenges and fragmented roles and responsibilities across agencies and departments represent transport institutions' main governance barriers.

Funding challenges

Funding challenges were a barrier identified by the majority of responses received. Many respondents indicated that reliance on external funding, both horizontally and vertically, represented a significant barrier to their institutional capacity, as the process to allocate funding may pose project delays and even disruptions. Respondents mention how the transport sector is often competing with other high-priority sectors for funding. This "crowding out of public budgets" can be a significant challenge for transport institutons. (UITP, 2021) Further, literature argues that the availability of stable and secure financial resources and decision-making power over these resources are extremely important for urban transport institutions to be able to carry out their mandates. (Kumar & Agarwal, 2013)

Fragmented responsibilities across agencies

Almost half of the responses (5 out of 12) identified fragmented responsibilities, horizontally across ministries for example or vertically between municipal, state- and national-level agencies, as a hindrance. These findings are complimentary to the key messages of a World Bank report clarifying that such fragmentation leads to inefficiency in the use of resources and ultimately leads to poor-quality services. (Kumar & Agarwal, 2013)

Lack of clear mandate and autonomy of institutions

4 out of 12 respondents spoke of "ambiguous decentralisation", being unsupported or generally lacking autonomy and requiring "constant collaboration with other levels of government" as a significant barrier to their institutional capacity.

Lack of institutional integration and coordination

Closely related to the above mentioned fragmentation issue is the finding by a fourth of respondents that there is a lack of institutional integration and coordination with different agencies and departments "working in silos" (Kochi).

Lack of supportive regulations and policies

A fourth of respondents also mentioned how existing regulations and policies may hinder their institutional capacities. For example, launching new green technologies requires significant investments from the private sector, which existing regulations may not always allow.

> *"The widespread adoption of EVs in the commercial sector would require amendments to existing laws and new incentives, which involve cooperation from both state and federal authorities." (Lagos)*

Regulatory enforcement gap

In cases where regulations are in place, some respondents pointed out that there is an enforcement gap, with regulations being inconsistently enforced.

Lack of streamlined approval processes

Project delays due to bureaucratic approval processes were also noted by some respondents calling for a need to streamline. Disaggregating for geographic location, it seems this barrier is only mentioned by transport institutions located in Europe.

Other notable hindrances identified by single respondents included:

Lack of public awareness of the benefits of sustainable transport projects often leading to authorities choosing economic benefits (profits) over socio-environmental benefits.

> *"There is a noticeable lack of awareness of SDGs in planning, both at the city and state levels. Projects are often assessed for their financial gain not considering the intangible gains in society and, environment sustainable models can bring about."*

Lack of alignment between the local and national-level may often lead to municipal agencies having to strive for transport decarbonisation without national support.

> *"National carbon reduction strategies (as part of managing Nationally Determined Contributions for the climate) lean towards AFOLU (Agriculture, Forestry, and Land Use) – again with Land Use focusing more on reclamation activities in rural Ghana. This means, cities in Ghana must provide most of their own leadership in tackling transport related emissions more or less." (Accra)*

Table 9 summarises enablers and barriers to transport governance and highlights the different transport institutions who mentioned them.

Table 9: Enablers and barriers to transport governance

Transport governance enablers	Referencing transport institutions	No./14
Clear mandate and autonomy of authority	Accra, Lagos, Lviv, Merida, Yucatán, Paris	6
Alignment between local and national level	Casablanca, Lagos. Mexico, Sarajevo, Trabzon	5
Allocation of resources incl. funding	Accra, São Caetano do Sul, Sarajevo	3
Enabling laws, policies and regulations	Cape Town, Lagos	2
Authority strategy/approach	Mersin, Tirana	2
Membership in international organisations	Accra	1
Transport governance barriers	**Referencing transport institutions**	**No./12**
Funding challenges	Accra, Lagos, Leipzig, Mersin, Sarajevo, Trabzon, Yucatán	7
Fragmented responsibilities across agencies	Lagos, Merida, Peshawar, Sarajevo, Trabzon	5
Lack of clear mandate and autonomy of authorities	Cape Town, Trabzon, Yucatán, Merida	4
Lack of institutional integration and coordination	Kochi, Merida, Sarajevo	3
Lack of supportive laws, regulations and policies	Cape Town, Lagos, Mersin	3
Lack of streamlined approval processes	Lviv, Sarajevo, Trabzon	3
Regulatory enforcement gap	Lagos, Trabzon	2
Lack of awareness of sustainability	Kochi, Sarajevo	2
Lack of alignment between local and national level	Accra	1

5.2. Transport planning

In the context of this study, the transport planning capacity refers to the presence of well-established mobility plans or strategies for the achievement of climate targets in the transport sector.

Respondents identified whether they have mobility plans and strategies in place guiding their work. Some respondents reflected on how the existence or lack thereof affected their transport planning capacities.

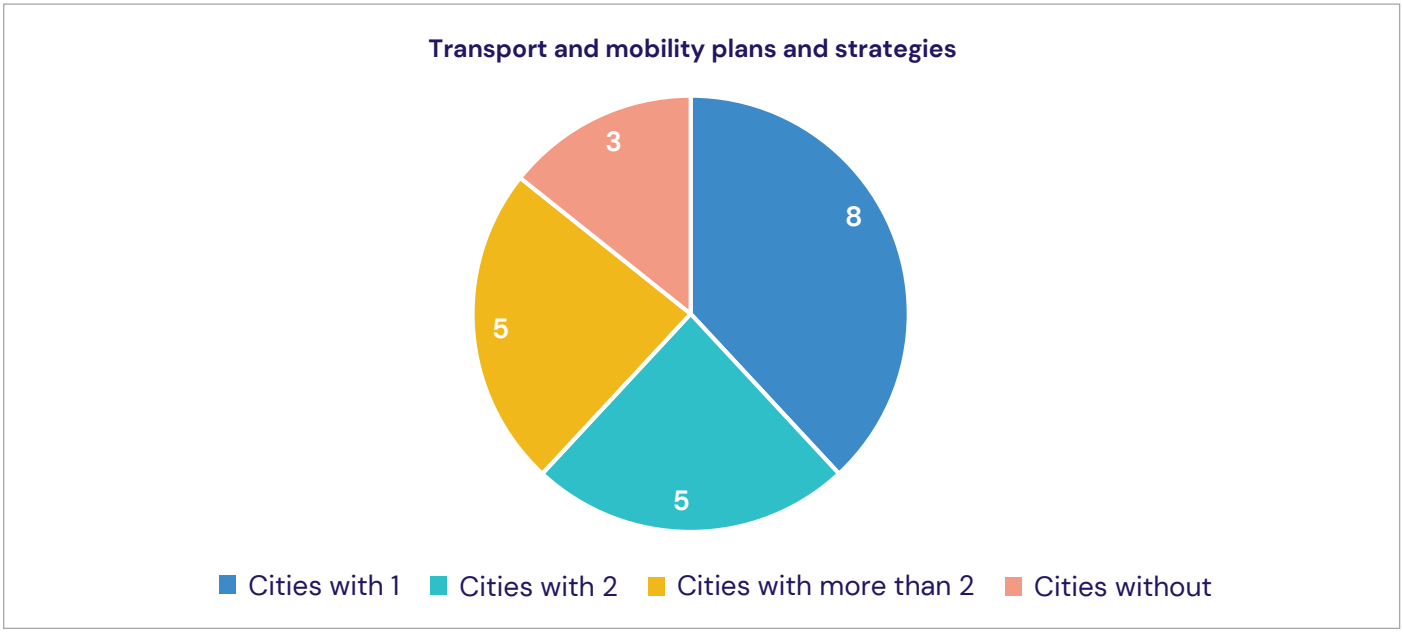

Figure 14: Transport and mobility plans and strategies

- In total, 18 transport institutions mentioned having at least one if not more than two transport and mobility plans and strategies in place providing them with a general framework to operate.
- Three transport institutions did not indicate any information.

Transport institutions further mentioned the different plans and strategies they have in place guiding their work.

Sustainable Urban Mobility Plans (SUMPs) are the main, but not yet commonly established, plans followed by transport institutions to achieve transport decarbonisation goals.

- **Sustainable Urban Mobility Plans** (SUMPS) were mentioned by nine out of 18 of the respondents, with Trabzon mentioning having one on the national level.
- Three transport institutions mentioned metropolitan and national-level **Climate Action Plans** (Accra, Lagos, Tirana) with two of them also having **Resilience Strategies** in place (Accra, Lagos).
- Four respondents mentioned **mode-specific plans** such as plans focusing on walking and cycling (Accra, Leipzig, Mersin), on rail (Kochi) and on e-mobility (Lviv).

Figure 15: Transport plans and strategies

5.3. Technical capacity

In the context of this study, technical capacity refers to the capacity of transport institutions to plan and implement high-quality transport projects without major delays.

To gauge transport institutions' technical capacity, the questionnaire asked respondents to provide examples of their organisation's success stories in planning and implementing high quality, well-designed transport infrastructure without major delays.

Responses received (13) demonstrated examples of transport projects that were either completed or ongoing. Analysing the responses yields an overview into the different transport and mobility topics and modes transport institutions have been focused on (see *Table 10* below):

Walking and Cycling

Almost all respondents mentioned investing into their walking and cycling networks whether this was done via establishing or increasing bike lanes, introducing bike-sharing programmes and apps, upgrading and/or expanding the bike-sharing fleet or investing in pedestrian areas and working on accessible sidewalks.

E-mobility

The second most mentioned area of interest and activity for transport institutions has been deploying electric buses (e-buses) or investing in the cities' readiness for e-mobility services.

Bus and Bus Rapid Transit (BRT)

Several transport institutions mentioned projects related to increasing and/or upgrading their bus fleets or improving bus infrastructure including establishing dedicated bus lanes. Several cities specifically mentioned doing so in the framework of BRT project.

Other notable mentions included how transport institutions have been investing in **smart traffic management systems** including bus priority schemes. A few cities also mentioned (light) rail projects and automatic fare collection (AFC) systems.

Beyond the thematic and modal focus areas of transport institutions, it was interesting to deduct the success indicators and success factors mentioned by some transport institutions within their responses. As the question alluded, all examples of success stories provided included projects, which have been successfully delivered including being within budget and without significant delays. Further, some cities mentioned that projects were considered successful because they achieved their objectives. Some of the project objectives mentioned were the reduction of travel times, provision of reliable and affordable transport, passenger growth, reduced traffic congestion and emissions, etc. Other single respondents clarified that ensuring that passenger services were not disrupted during the renovations, as well as receiving awards is seen as a success indicator.

Table 10: Focus areas of transport institutions

Focus areas	Transport institutions	No./13
Walking & Cycling	Belgrade, Cape Town, Lagos, Merida, Mersin, Mexico City, Paris, Recife, São Caetano do Sul, Sarajevo, Trabzon, Yucatán	11
E-mobility	Belgrade, Kochi, Mexico City, Merida, Paris, Tirana, Trabzon, Yucatán	7
Bus fleet and infrastructure	Accra, Cape Town, Merida, Recife, Tirana, Trabzon, Yucatán	6
BRT fleet and infrastructure	Accra, Cape Town, Casablanca, Lagos, Mexico City	5
Road infrastructure	Cape Town, Leipzig, Lviv, Merida, Yaoundé, Yucatán	5
(Smart) Traffic Management Systems	Accra, Belgrade, Merida, Yucatán, Trabzon	4
(Light) Rail fleet and network	Casablanca, Lagos, Mexico City	3
Automatic fare collection	Accra, Kochi, Lviv	3
Professionalisation of Informal Transport	Trabzon, Yaoundé	2
Capacity Development for staff	Accra, Yaoundé	2
Transport Master Plans	Lagos, Mersin	2
Establishment of transport organisation	Peshawar	1
Waterborne transport	Kochi	1
Public Transport Conference	Kochi	1
Parking management	Lviv	1
Free public transport	São Caetano do Sul	1
Children's transport safety	Mersin	1
Taxi sector regulation and reform	Tirana	1
Trolleybus fleet and network	Mexico City	1
AI-based transport planning	São Caetano do Sul	1
Cable Car fleet and network	Mexico City	1

Table 11: Success indicators

Success indicators	Transport institutions	No./13
Successful delivery of projects	All	13
Achieving project objectives	Lagos, Peshawar, Sarajevo, Trabzon	4
Undisrupted passenger services	Trabzon	1
National and international recognition (awards)	Peshawar	1

Some answers from the transport institutions also allowed deducing success factors behind the different projects:

Stakeholder engagement, support from international cooperation actors and effective project management are the key functional capacities for successful project delivery.

Several responses referred to the **importance of stakeholder integration, coordination and cooperation as a key success factor**. Here, respondents noted that the process should be multi-displinary and take place on a **horizontal and vertical level**. Respondents highlighted the importance of including and consulting, on the vertical level for example, transport unions, private operators, and funding partners. With regards to multi-disciplinarity, transport institutions spoke of engaging urban planners, environmental experts and private technology providers (suppliers and infrastructure providers), as well as construction teams.

Several responses identified the **adherence to the project schedule as a key success factor**. This includes on-time procurement, construction and delivery, as well as phasing out project implementation to avoid delays, bottlenecks and allowing gradual testing.

Finally, some transport institutions also highlighted the support from international cooperation actors as well as having a strong and dedicated project management team as key success factors.

Table 12: Success factors

Success factors	Transport institutions	No./
Adherence to project schedule	Lagos, Merida, Sarajevo, Trabzon, Yucatán	4
Stakeholder integration, coordination and cooperation	Lagos, Oaxaca, Sarajevo, Trabzon	4
Support from international cooperation actors	Oaxaca, Peshawar, Sarajevo	3
Strong, dedicated project management team	Peshawar, Trabzon	2
Funding via PPP to help accelerate project implementation	Lagos	1
Focusing on transport integration, sustainable modes, accessibility and safety	Lagos	1
Plan is realistic, actionable, and aligned with broader urban development goals.	Lagos	1

5.4. The importance of institutional level capacities for transport decarbonisation

After having explored and discussed the different capacities on the institutional level, respondents were asked to rate how important they thought these different capacities (transport governance, planning and technical capacity) were for the achievement of transport decarbonisation.

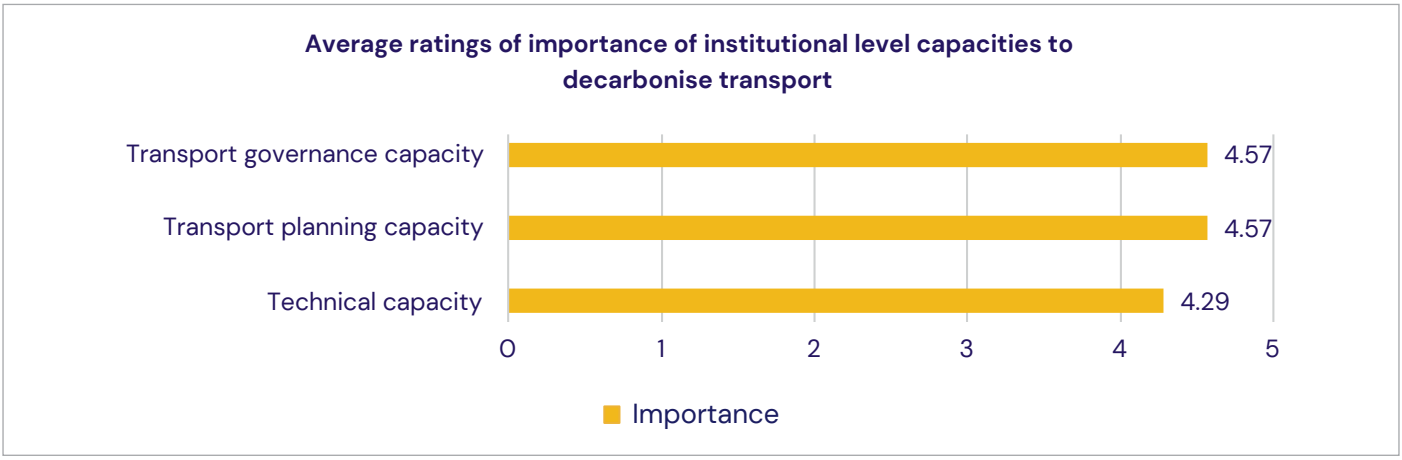

Figure 16: Average ratings of importance of institutional level capacities to decarbonise transport

On average, all respondents viewed the institutional capacities to be between important and very important, with the transport governance and planning capacities being seen as the highest in terms of importance.

Transport institutions view institutional capacities as being important for their ability to successfully decarbonise transport and achieve sustainability goals, governance and planning capacities especially.

When asked to assess their current capacities, on average, all respondents indicated moderately high capacities across the three institutional capacities, indicating room for improvement. The biggest capacity gap, i.e. the biggest difference between how important they view the capacity and their current capacity level, was observed in the transport governance capacity.

Capacity gaps are observed for all institutional capacities, where the biggest gap is seen in the transport governance capacity of transport institutions.

These results help identify the improvement areas capacity development support can focus on in the future. However, it should be noted that (urban) transport institutions, especially newly established ones, take time to evolve. (Kumar & Agarwal, 2013)

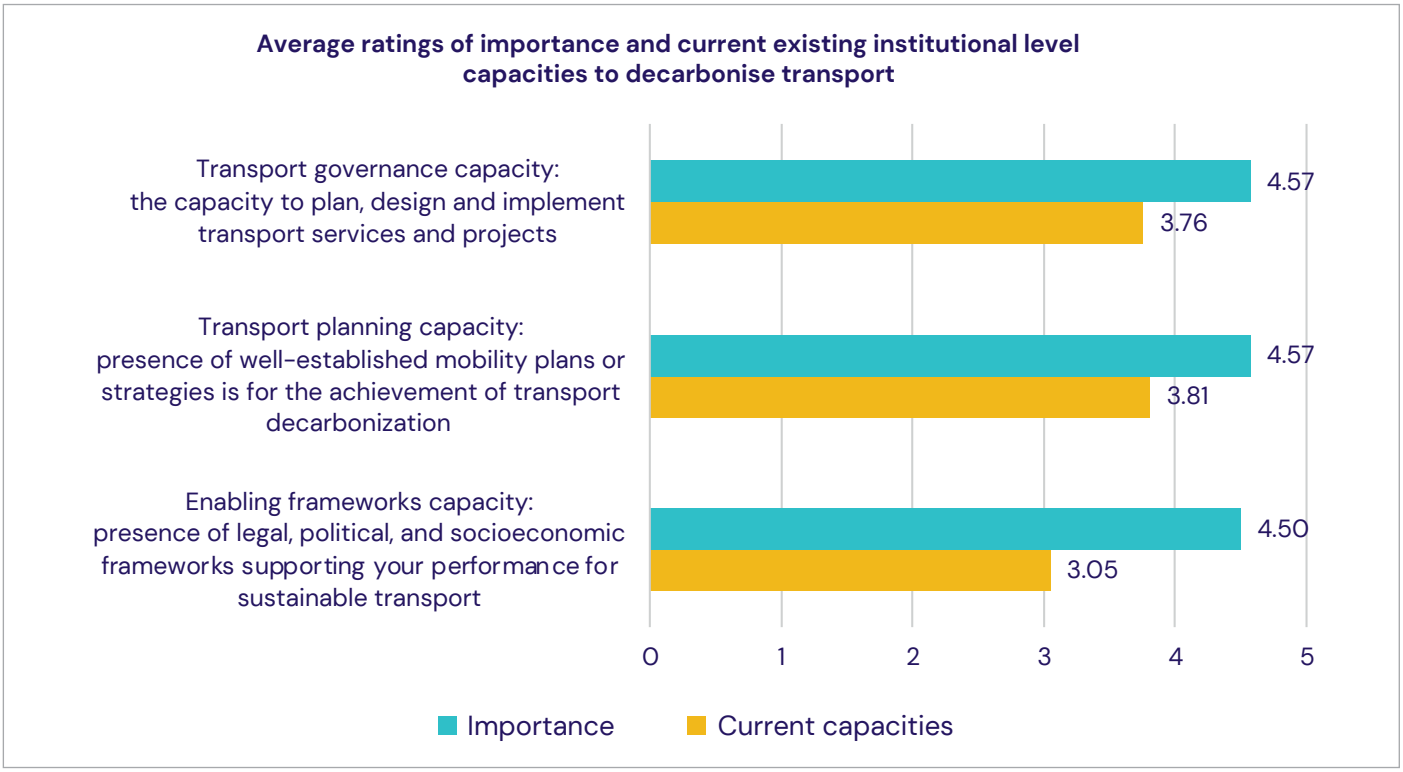

Figure 17: Average ratings of importance and current existing institutional level capacities to decarbonise transport

6. Societal level capacities

Practicioners identify two capacities encompassing the societal level, which are somewhat external to institutions, but very much affect their abilities and performance. These are the enabling (or hindering) environment as well as cooperation and partnership frameworks. (GIZ, 2015) Both sub-capacities shall be explored below via the questionnaire responses.

6.1. Enabling and hindering environment

With regards to the enabling environment, the questionnaire included an open-ended question asking respondents to explain to which degree the existing legal, political, and socio-economic frameworks in which they operate support or hinder them.

Respondents identified both supportive and hindering factors. Out of the 21 respondents, 3 did not mention supportive factors, whereas 7 did not mention hindering factors. In the following, we will do a deep dive of both factors, which shall be referred to as enablers and barriers in this study.

Transport institutions indicate shared legal, political and socio-economic capacity enablers and barriers on the societal level.

On the legal side, the majority of transport institutions mentioned how laws, regulations and policies may act as enablers. For example, some institutions mentioned that having tax incentives in place promotes the deployment of e-vehicles. Others mentioned how the local regulations require Environmental Impact Assessments (EIA) prior to implementing projects, which further supports transport decarbonisation (Lagos). Laws allowing and institutionalising public-private-partnerships (PPPs) were also named as supportive legal frameworks for transport institutions.

With regards to the legal barriers, more factors were identified, however they were not as frequently mentioned. A few transport institutions mentioned that the fragmented roles and responsibilities between agencies may act as a barrier, as authorities tend to "work in silos" (Kochi). Further, local and state-level institutions may face difficulty in accessing funding, especially from the national level, further affecting their performance. Complex approval and bureaucratic processes were also mentioned.

Table 13: Legal factors supporting or hindering the performance for sustainable transport

Enabling legal frameworks	Transport institutions	No./21
Enabling laws, regulations and policies (incl. incentives, ESIA, PPP)	Accra, Cape Town, Kochi, Lagos, Mersin, Mexico City, Sarajevo, Trabzon, Yucatán	9
Access to funding	Sarajevo, Yucatán	2
Hindering legal frameworks	**Transport institutions**	**No./21**
Fragmented governance structure and working in silos	Kochi, Sarajevo, Trabzon, Yucatán	4
Access to funding	Accra, Cape Town, Trabzon, Yucatán	4
Complex approval processes	Belgrade, Sarajevo, Trabzon, Yucatán	4
Inconsistent enforcement of laws	Trabzon, Yucatán	2
Limited mandate and local autonomy	Cape Town, Trabzon	2

On the political level, respondents indicated that having government support, commitment and leadership facilitated their ability to perform their transport decarbonisation projects. Literature identifies the role of not only national level political figures such as ministers, but also of mayors for example. (UITP, 2021) In fact, literature notes political champions backing transport institutions to be "critical to success." (Kumar & Agarwal, 2013)

The lack of political support to transport decarbonisation, especially due to staff changes and shifts in government priorities, may in turn act as a barrier. Funding constraints due to political reasons were also identified as barriers by respondents.

Table 14: Political factors supporting or hindering the performance for sustainable transport

Enabling political frameworks	Transport institutions	No./21
Government/political commitment/support/leadership	Lagos, São Caetano do Sul, Sarajevo, Trabzon, Yucatán	5
Hindering legal frameworks	**Transport institutions**	**No./21**
Funding constraints and disruptions (transport competing with other priority sectors)	Lagos, Mersin, Mexico City, Sarajevo	4
Government changes (staff and shifts in priorities)	Sarajevo, Trabzon, Yucatán	3

Public awareness and community demand and support were mentioned as part of the socio-economic factors that may support or hinder the performance of transport institutions with regards to transport decarbonisation.

> *"Public awareness of sustainable transport solutions remains relatively low, making it more difficult to generate widespread support for transformative projects." (Sarajevo)*

Some transport institutions also highlighted how the affordability of sustainable projects and services given may impede the implementation and large uptake of such projects and services.

> *"While electric vehicles and modern public transport systems are being promoted, the high cost of such technologies may limit their adoption among lower-income populations." (Trabzon)*

Literature highlights though that transport institutions should be proactive in this regard by creating "something that the public values (and knows about)". (Kumar & Agarwal, 2013) Thus, public support can be gained and should not remain an external enabler or barrier. One way transport institutions can do this is by meeting their project objectives, as mentioned as a success factor under institutions' technical capacity, and thereby "delivering on public expectations" (ibid.) Further, transport institutions should communicate and engage with the community to raise and win public support. Here, as mentioned under the educational capacity of staff members, the importance of hiring competent marketing and communication experts is emphasized.

Table 15: Socio-economic factors supporting or hindering the performance for sustainable transport

Enabling socio-economic frameworks	Transport institutions	No./21
Public awareness and community demand/support	São Caetano do Sul, Yucatán, Lagos, Trabzon	4
Hindering socio-economic frameworks	**Referencing transport institutions**	**No./21**
Affordability and socio-economic context of population and local government	Lagos, Trabzon, Yucatán	3
Public awareness and cultural preferences	Lagos, Sarajevo, Trabzon	3

6.2. Cooperation and partnerships capacity

Literature emphasizes that inter-institutional coordination and partnerships are critical with regards to developing integrated, comprehensive and sustainable transport systems. (Kumar & Agarwal, 2013) The need for coordination and cooperation does not only stem from fragmented governance structures but is also due to urban sprawl: It is argued that transport patterns are not always on par with the boundaries of local government authorities, extending beyond the geographic jurisdiction of municipal transport institutions. (ITF, 2020; Kumar & Agarwal, 2013)

To gauge the capacity of transport institutions to cooperate and partner with other stakeholders, the questionnaire asked respondents about the level of ease and the frequency of cooperating.

The level of ease of creating partnerships was inquired about through an open-ended question where some respondents indicated that it is "very easy", "easy", "moderate" or that they face "no obstacles", whereas others were more descriptive in their responses.

The majority of transport institutions easily cooperate and coordinate with other relevant stakeholders.

The majority of the respondents described that cooperating with other government and non-government partners was either "very easy" (7), "easy" (8) or that they had "no obstacles" (1). A third of respondents described it as being "moderately easy" (7).

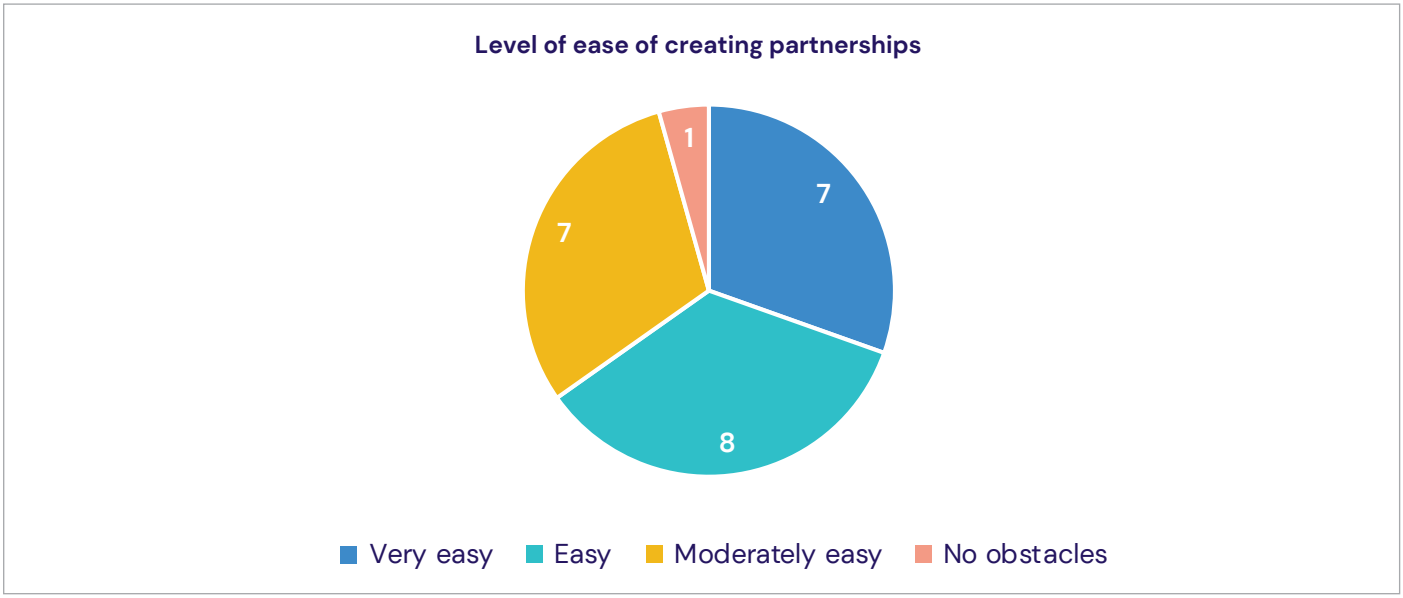

Figure 18: Level of ease of creating partnerships

This overall picture was aligned with the follow-up question related to the frequency of cooperating, where out of 19 valid responses, the majority (14 out of 19) mentioned cooperating "more than 4 times per year", and one mentioning "everyday". Other responses received were "two times per year", "once a year" and "less than once a year".

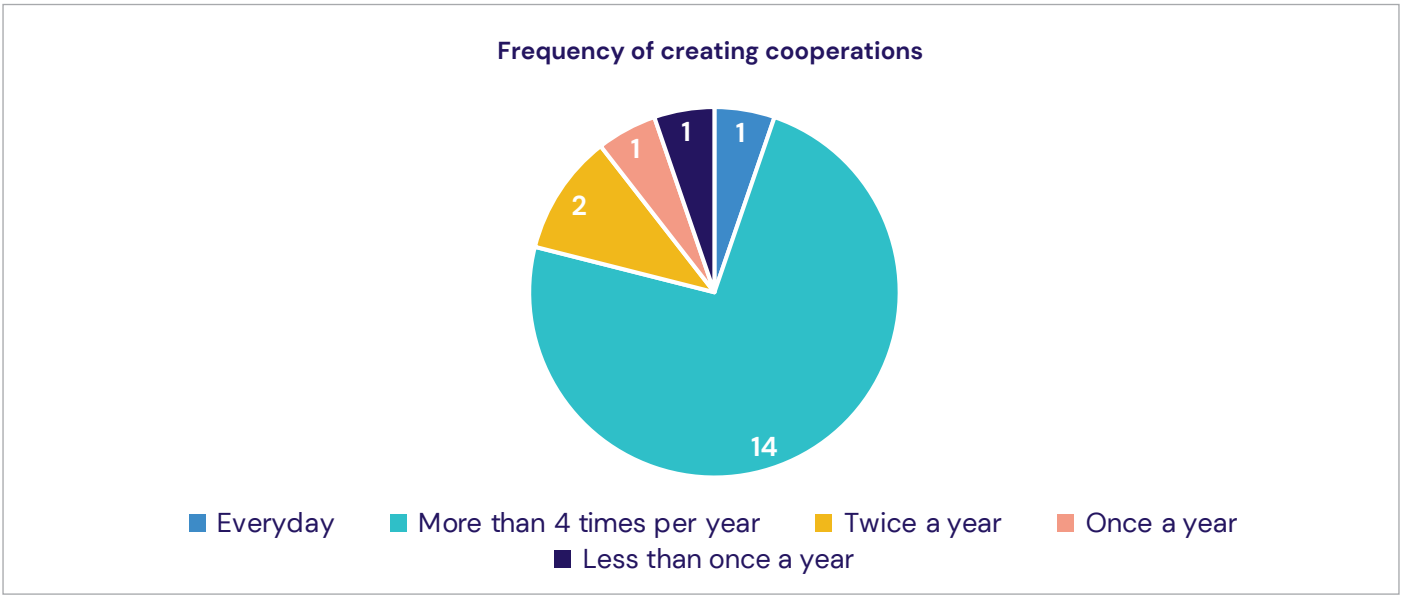

Figure 19: Frequency of creating cooperations

While the questionnaire results seem to indicate that transport institutions find it generally easy to cooperate with other stakeholders and that they do so frequently, it should be noted that these questions did not establish an understanding of what is meant by cooperation or who other relevant stakeholders are, but rather left these open to the respondents' interpretation.

It will be important to understand which stakeholders they cooperate with and which not. For example, sustainable mobility advocates recommend that transport institutions coordinate not only with stakeholders related to traditional public transport services, but also with new mobility providers and users, such as bike-sharing, ride-hailing, and carpooling providers, but also with the informal public transport sub-sector,

which is prevalent in fast-growing low- and medium-income countries. (UITP, 2021)

Further, the answers under the enabling environments capacity showed that many transport institutions struggle with fragmented roles and responsibilities across agencies, unclear mandates and the lack of local and national level alignment, thus suggesting that cooperation and partnership frameworks can and should indeed be improved.

As a next step, It will be important to see, how transport institutions are cooperating and partnering with other stakeholders and how the mode of cooperation can be further improved and optimised to support cities' transport decarbonisation.

6.3. The importance of societal level capacities for transport decarbonisation

After having elaborated on and discussed the two-sub capacities related to the societal level, transport institutions were asked to assess the importance of both capacities for transport decarbonisation.

Transport institutions confirmed the importance of the enabling frameworks and the cooperation and partnerships capacities in supporting the achievement of transport decarbonisation, where the enabling legal, political and socio-economic frameworks played a more important role than the cooperation and partnerships capacity.

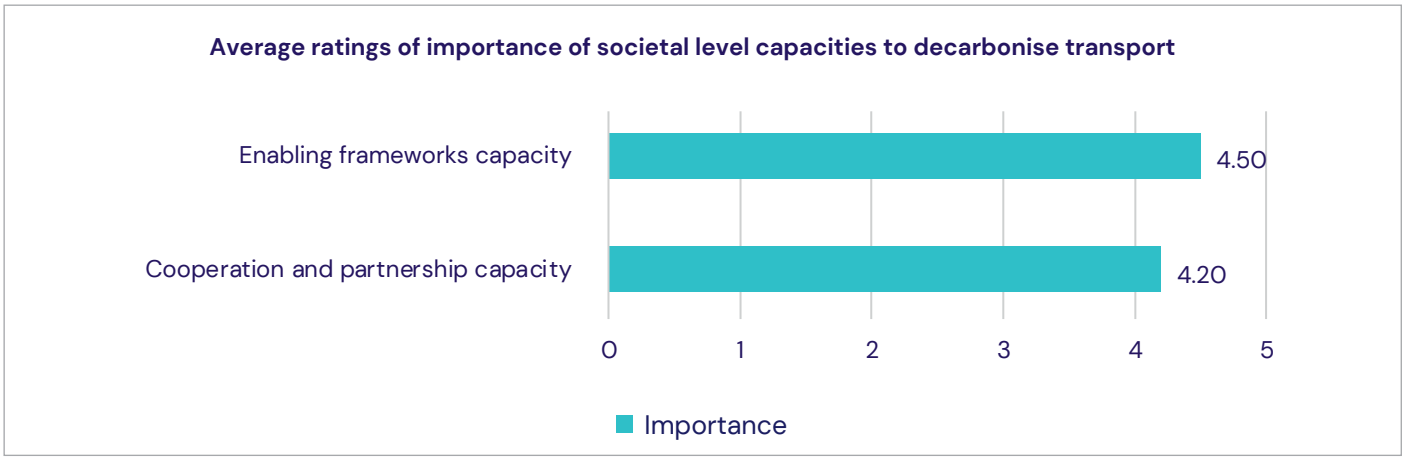

Figure 20: Average ratings of importance of societal level capacities to decarbonise transport

When asked to assess the existing societal capacities, it again becomes clear that there are significant capacity gaps on the societal level.

Significant capacity gaps can be seen on the societal level where both the enabling frameworks and the cooperation and partnerships capacity of transport institutions are only moderately high compared to their high importance with regards to transport decarbonisation.

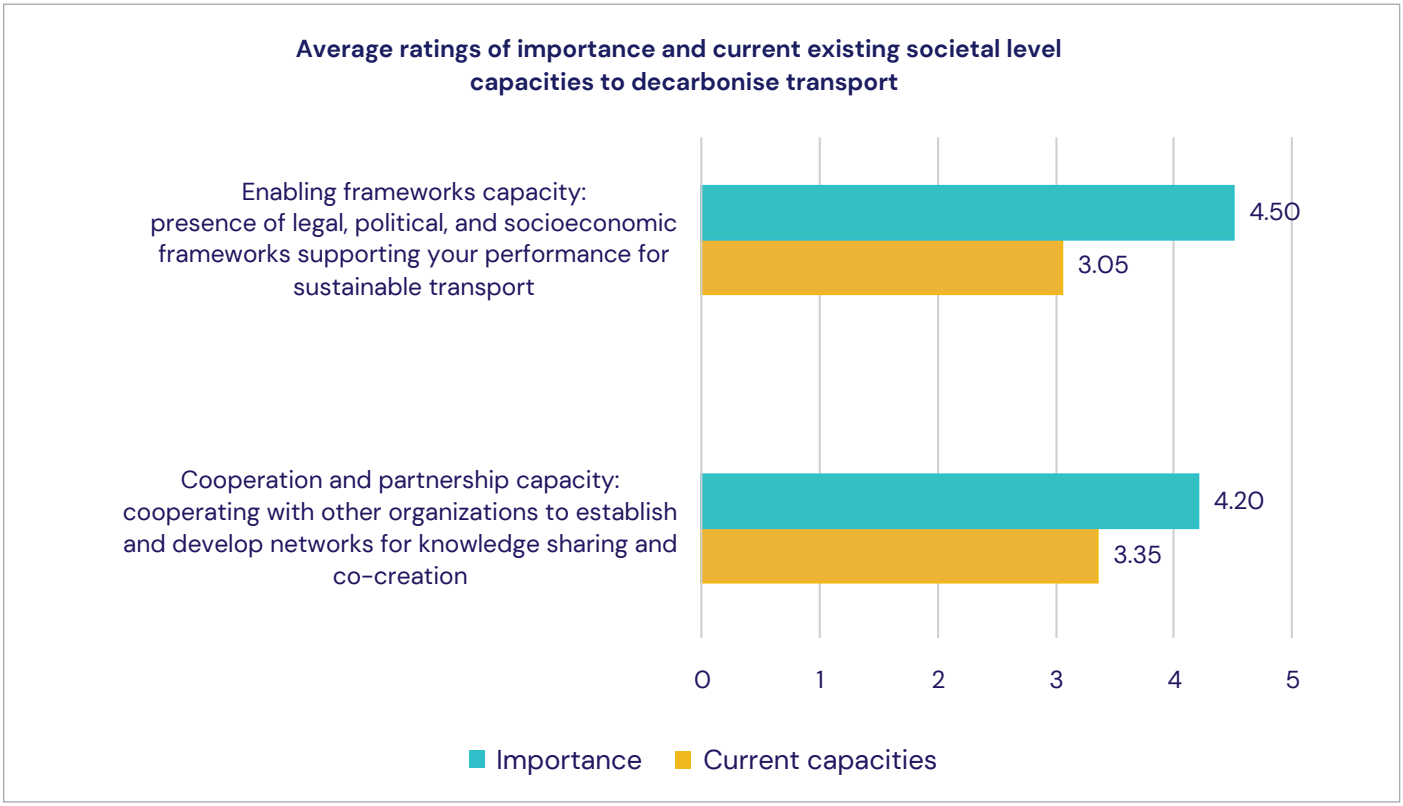

Figure 21: Average ratings of importance and current existing societal level capacities to decarbonise transport

7. Identifying, assessing and addressing capacity gaps

To recap the findings regarding the importance and current state of capacities across the different capacity levels, respondents were asked two consecutive questions: the first evaluates how important they perceive each capacity listed in *Table 1* (individual capacities), *Table 2* (institutional capacities), and *Table 3* (enabling environment capacities) for achieving sustainable mobility, and the second assesses their current level in each of these capacities.

All transport institutions confirm the significance of capacity development for the achievement of sustainable mobility targets. However, all transport institutions indicate that their current capacities on the individual, institutional and societal levels are insufficient.

The averages of all participating transport institutions show that all capacities are viewed as very important, scoring an average value of 4.0 (important) and above, indicated in blue in *Figure 21*. Meanwhile, the current capacities scored lower averages, indicated in yellow in *Figure 21*, which reveals a gap between the desired capacity levels by transport institutions, and their current capacity levels.

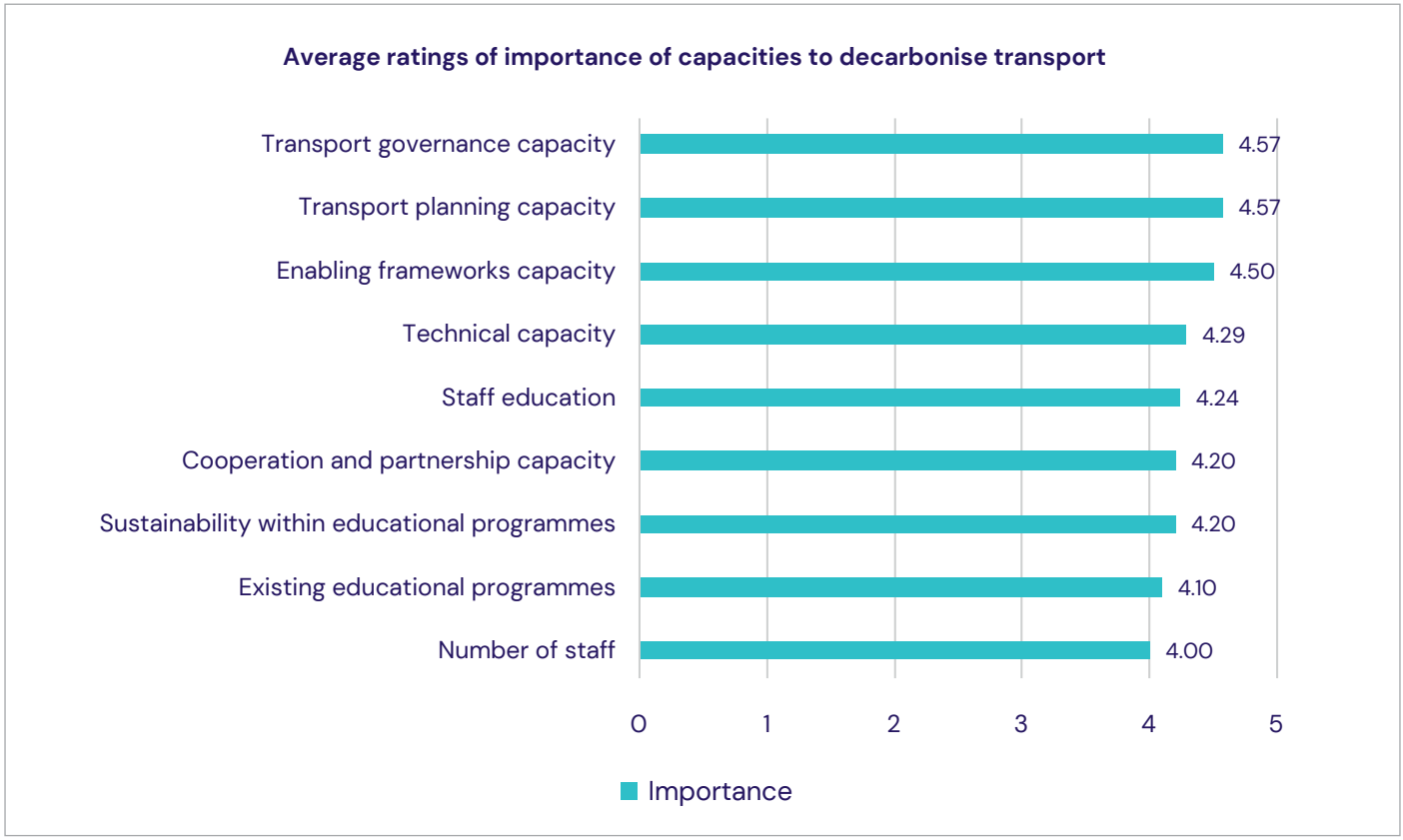

Figure 22: Average ratings of importance and current existing capacities to decarbonise transport

This analysis of all sub-capacities put together reveals three main highlights:

- The highest and lowest assessments, both in terms of importance and in terms of current capacities of transport institutions.
- A comparative overview showing which capacity types are perceived more important than others.
- The significant gaps across the different capacities.

What do transport institutions perceive as the most important capacity?

Transport planning and governance are rated as the two most important capacities for transport institutions to achieve transport decarbonisation. Enabling frameworks represented in the legal, political and socio-economic frameworks come in third place in terms of evaluated importance.
The capacity of institutions to plan, design and implement transport projects, and the presence of strategic mobility plans to guide their performance is a key capacity to achieve transport decarbonisation.

The number of staff and the education gap reflected in the lack of educational programmes focusing on transport and mobility, are rated as important, scoring slightly lower than the previously mentioned capacities, at 4.0 and 4.1, respectively.

What are the strongest and weakest capacities transport institutions currently possess?

On average, transport institutions have self-assessed their capacities moderately high to low. The highest average was reported for respondents' **transport governance** capacity. A close second was the **transport planning** capacity.

Sustainability within educational programmes, existing educational programmes and the number of staff are assessed as transport institutions' weakest capacities across all respondents.

Where did the transport institutions have the biggest capacity gaps?

By calculating the differences between the average importance ratings and the current capacity, we can identify capacity gaps where perceived importance exceeds existing capabilities.

The results reveal that the most significant capacity gaps are observed in sustainability within educational programmes, the enabling frameworks, and the number of staff capacity.

7.1. Managing capacity gaps

After identifying the capacity gaps transport institutions are faced with, respondents were asked in an open-ended question to provide examples of how they address these gaps. The responses revealed different approaches, including not only activities to address, but also tools to assess capacity gaps.

7.1.1. Activities to address capacity gaps

Transport institutions plan and provide capacity building activities that address capacity gaps such as trainings, peer learning or other capacity building activities. Capacity building activites[16] can extend for short periods of time (such as trainings, workshops and conferences) to longer periods of time (such as formal education and scholarships). (Moawad & Abdul Aziz, 2024) The responses of the transport institutions show how they adopt different capacity development formats, as illustrated in *Table 16*. However, trainings are mentioned by almost half the transport institutions.

Table 16: Tools to address capacity gaps

Method	Transport institutions	No./21
Trainings *incl. targeted, external or in-house trainings*	Belgrade, Cape Town, Casablanca, Kochi, Lagos, Leipzig, Merida, Peshawar, Recife, Sarajevo, São Caetano do Sul, Tirana, Trabzon	13
Mentorship and peer learning *incl. staff rotation, on-the-job learning*	Belgrade, Lagos, Lviv, Oaxaca, Sarjevo, Trabzon, Yucatán, Kochi	8
Workshops	Kochi, Lagos, Sarajevo, Trabzon	4
Courses	Merida, São Caetano do Sul, Sarajevo, Recife	4
Formal education	Lviv, Merida, Trabzon, Yucatán	4
Seminars and conferences	Sarajevo, Trabzon, Yaoundé	3
Study tours	Kochi, Trabzon, Sarajevo	3
Scholarships	Trabzon, Yucatán	2
Access to data portals and libraries *(online and offline)*	Lviv, Trabzon	2
Partnerships with universities	Trabzon	1

The majority of transport institutions invest in training programmes to overcome capacity gaps.

16 The HVT capacity building study identifies 14 formats of capacity building activities, which are seminars, workshops, conferences, trainings, study tours, mentorship programmes, expert dialogues, participation in associations, scholarships, the establishment of centers of excellence, MooCs, formal education, knowledge reports and access to data portals and libraries. (Moawad & Abdul Aziz, 2024)

To respond to capacity gaps, most of the respondents (13) mention the use of **trainings**, whether these are general or specialised, customised training programmes, which are either delivered through in-house or external experts. One city mentioned adopting a continuous professional development plan, which frames capacity building activities within a wider institutional plan to improve workforce skills.

Mentorship and peer learning are also widely used. In the context of this study, mentorship can be defined as learning from more senior internal or external professionals, while peer learning is learning from counterparts, i.e. from internal or external professionals of a similar seniority level. This also includes on-the-job learning, which entails learning through hands-on experience and "exposure to real-world challenges under expert guidance" (Lagos). These exchanges can happen through different activities, such as cross-departmental coordination within ongoing projects, staff rotations, or collaborative projects.

*We **promote cross-departmental collaboration**, allowing staff to work alongside more experienced colleagues, which fosters knowledge transfer and hands-on learning." (Sarajevo)*

*"**Employees are rotated between different roles**, from field operations to desk-based assignments or across departments. **This not only broadens their skillsets, but also provides a holistic understanding of LAMATA's operations**." (Lagos)*

*"**Collaborative projects** also offer hands-on experience, allowing employees to apply new knowledge in real-world scenarios." (Yucatán)*

7.1.2. Tools to assess capacity gaps

A few of the open-ended answers received by the respondents also indicated the use of tools to assess capacity gaps and to make plans on how to overcome them. These include regular performance monitoring via (annual) appraisal reports and conducting training needs assessments, for example.

However, it is reasonable to assume that transport institutions tend to be reactive to capacity gaps, and not proactive. Most transport institutions do not have institutionally embedded tools in place to thoroughly assess capacity gaps and to plan how to address them.

A World Bank study finds that there are three scenarios that explain when capacity gaps assessments are conducted, and this can be within a *proactive scenario*, where the needs assessment is conducted to find opportunities to improve performance or a *reactive scenario* where it emerges to address undesired results, or as a *continuous approach* where assessments are instilled in development processes. (Watkins, Meiers, & Visser, 2012)

Yet only a handful of transport institutions mentioned the use of continuous activities to plan long-term capacity development, which are listed in *Table 17*.

Table 17: Tools to assess capacity gaps

Method	Description	Transport institutions	No./21
Performance monitoring (appraisal reports)	Monitors and reviews staff performance on a regular basis, typically annually, to identify areas of improvement.	Accra, Trabzon, Lagos	3
Training needs assessment (TNA)	Conducted across departments by the department head(s) or via staff member self-assessment to identify knowledge and skill gaps.	Cape Town, Lagos	2
Personal and professional development plans	Personalised employee development plans based on training needs assessments.	Lagos, Sarajevo	2
Succession planning[17]	A succession plan focuses on efforts the institution can endorse to encourage employees to advance within the institution.	Cape Town	1

Having these tools in place supports not only identifying capacity gaps, but it also supports transport institutions in their efforts to ask for and/or to allocate funding for capacity development, and to increase the annual budget thereof (Cape Town).

When confronted with capacity gaps, transport institutions typically respond by addressing and developing capacities on the individual level through trainings and peer learning. None of the transport institutions utilised institutional or societal tools (such as increasing training budgets) to address gaps.

Some respondents also mention the role of bureaucratic processes to acquire training, and how these processes can hinder and not support the training of staff. In Accra, the human resources department needs to submit a memo with recruitment and training needs to the local government service of Ghana through a regional coordination council. This process prolongs responses to urgent requests. In Tirana, on the other hand, there is direct communication to the training department to request trainings.

Most answers show that transport institutions are addressing capacity gaps depending on their available resources and institutional set-up. Some respondentsmentioned attracting foreign experts to address capacity gaps.

7.2. Capacity development formats

After having established that almost all transport institutions make use of trainings, peer learning and mentoring to address capacity gaps, the questionnaire presented the transport institutions with the assumption that they are provided with a budget to spend on capacity development and asked them to choose which top three formats they would prefer out of a list of 14 formats, based on the different formats identified in HVT's capacity building study. (Moawad & Abdul Aziz, 2024)

By accumulating the responses, a clear preference is observed towards **study tours, trainings and workshops**. These formats are the three most selected formats of capacity building. This preference did not change when disaggregating the responses based on regions or country income levels.

17 The ILO defines a succession plan as one of the separation practices within organisations that identifies competent staff who could be promoted to specific positions within an organisation. (ILO, 2021)

When asked about their preferences in scenarios where additional budget is available, institutions tend to favor study tours, while still leaning towards trainings and peer learning, to develop their staff's capacity.

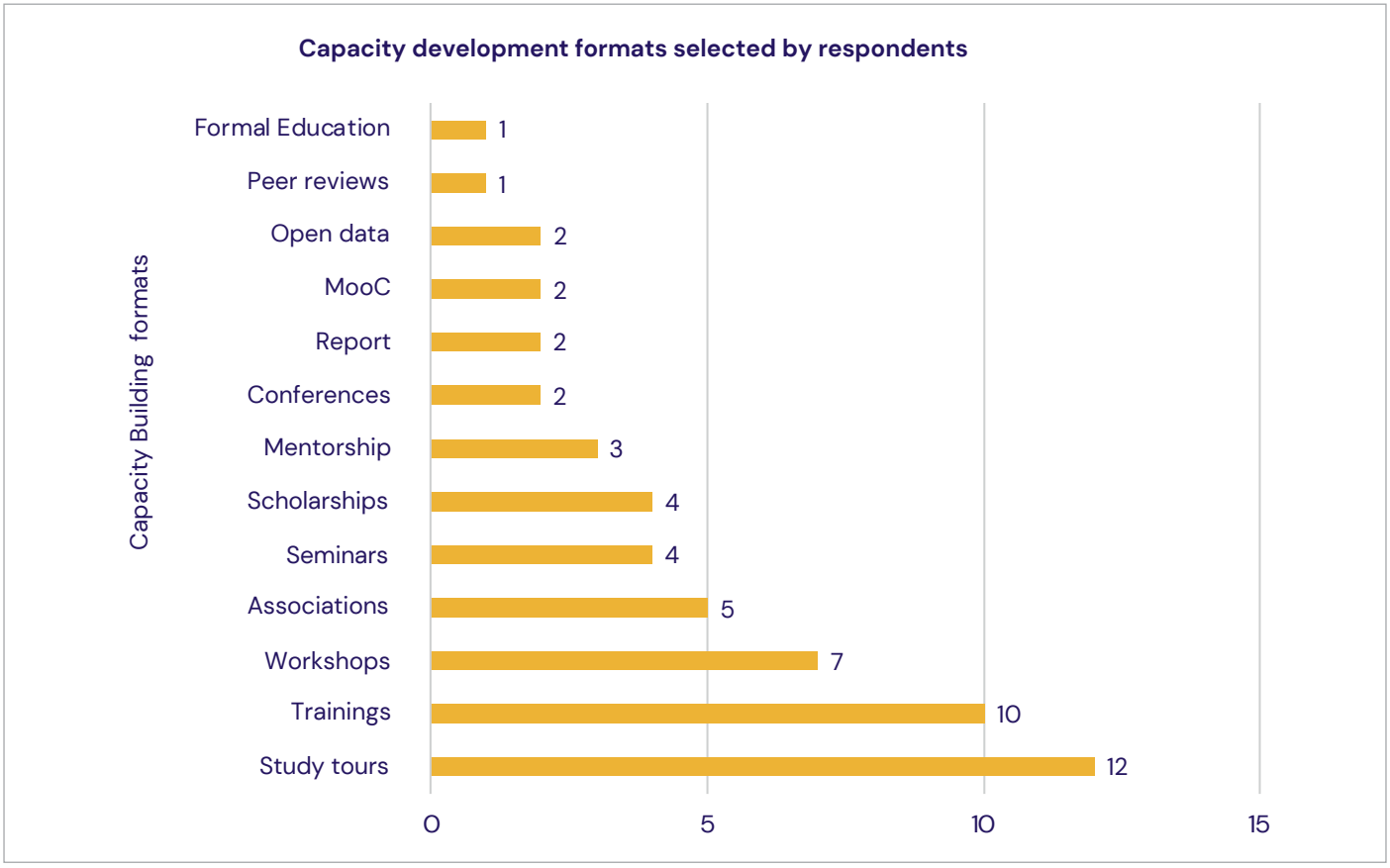

Figure 23: Capacity building formats arranged from least selected to most selected formats

Figure 23 reveals a clear preference towards study tours and trainings. Trainings are not a surprising result, esspecially looking at *section 7.1.1*, which identified trainings, and peer learning as a main approach adopted by transport institutions to address capacity needs. Meanwhile, the finding that study tours are chosen the most is a compelling finding, since they were only mentioned by three transport institutions in the previous open-ended question. This finding demonstrates the affordability consideration related to choosing capacity development formats. It also confims that study tours are a very attractive capacity development format for transport institutions, albeit an expensive one.

These results further show that institutions often address capacity gaps through readily accessible and cost-attractive formats, such as in-house learning mechanisms, peer-to-peer learning, and on-the-job training. However, when asked about their preferences in scenarios where a dedicated capacity development budget is available, respondents tend to favor study tours for knowledge-sharing, while still leaning towards less resource-intensive options to develop their staff's capacity, such as trainings.

The finding that study tours are the most-preferred format by transport institutions is also notable in that, according to findings of the HVT study, donor agencies are often hesitant to fund study tours, as they are resource-intensive and do not offer the same reach as other more accessible formats such as in-person or especially online trainings and courses do. (Moawad & Abdul Aziz, 2024)

7.3. Choice of capacity development format

Transport institutions seek capacity development programmes, activities and formats based on internal considerations. Thus, the choice of capacity development formats is a result of different considerations, which can be related to the current needs of the transport institution, the profile and the portfolio of the capacity building providers as well as budgetary constraints, as seen above. (Moawad & Abdul Aziz, 2024) The HVT study on capacity building in sustainable urban mobility for low-income countries develops an analysis framework to support institutions in analysing different capacity building formats where the analysis factors are categorised based on three main themes: content, target audience and logistics. (Moawad & Abdul Aziz, 2024)

In the questionnaire, transport institutions were asked in an open-ended question to explain what their key considerations are when choosing capacity development programmes for their staff. The answers revealed several considerations, with the relevance of the topic being the most important consideration mentioned by most transport institutions.

Table 18 summarises the coded considerations described above and arranges them from most mentioned to least mentioned. However, given the small sample size of 21 responses and the fact that this was an open-ended question where respondents were free to write in whichever level of detail they preferred, the order should not necessarily indicate relative importance, but rather, gives a detailed overview of possible considerations transport institutions make before choosing capacity development programmes.

In the second columns of the table, an attempt is made to link the considerations to the themes proposed by the HVT study. (Moawad & Abdul Aziz, 2024). When doing so it becomes clear that the content of a capacity development programmes is the most decisive element for transport institutions. Logistical elements and target audience considerations are secondary.

When choosing capacity development programmes, transport institutions prioritise the relevance and applicability of the acquired learnings, over factors like certification, cost and duration.

The **relevance of the topic** refers to the extent to which the content of the capacity development programmes is aligned with a transport institution's current and future institutional and departmental objectives, goals, needs and policies, therefore being of special interest. This consideration was mentioned by most respondents as being a decisive factor.

The second most mentioned factor was the **depth of learning and the teaching methodology**. Answers from respondents indicated that they prefer programmes with a high level of interaction and hands-on learning, ensuring an effective balance between theory and practice, as well as the integration of relevant case studies etc.

*Workshops are great for fostering collaboration among team members and **creating a space for exchanging ideas** and solutions to current challenges." (Sarajevo)*

*"The most important is to **exchange** between peer to peer" (Paris)*

Table 18: Considerations for choosing capacity building programmes

Factors	Theme	Transport institutions	No./21
Relevance of topic	Content	Accra, Kochi, Lagos, Lviv, Merida, Mersin, Mexico City, Peshawar, Recife, Sarajevo, Tirana, Trabzon, Yucatán	13
Depth of learning and teaching methodology	Content	Accra, Cape Town, Kochi, Lagos, Oaxaca, Peshawar, Trabzon, Yucatán	8
Learning outcomes and expected performance improvements	Content	Belgrade, Cape Town, Merida, Mexico City, Paris, Trabzon, Yaoundé	7
Reputation of providers and profile of experts	Content	Kochi, Lagos, Lviv, Sarajevo, Trabzon, Yucatán	6
Applicability of learnings	Content	Lagos, São Caetano do Su l, Sarajevo, Trabzon, Yucatán	5
Cost	Logistics	Lagos, Sarajevo, Trabzon, Yucatán	4
Format, location and accessibility	Logistics	Lagos, Merida, Sarajevo, Trabzon	4
Staff considerations	Target audience	Leipzig, Mexico City, Trabzon	3
Reputation of programme	Content	Lviv, Trabzon, Yucatán	3
Duration	Logistics	Kochi, Leipzig, Oaxaca	3
Flexibility (schedule, format)	Logistics	Sarajevo, Yucatán	2
Contextualisation of material	Content	Lagos, Trabzon	2
Certification and accreditation	Target audience	Lagos, Trabzon	2
Long-term support and access to experts & materials	Content	Lagos	1
Transferability and scalability	Content	Trabzon	1
Networking opportunities	Content	Sarajevo	1

With regards to **learning outcomes and expected performance improvements**, respondents mention that they are interested in capacity development programmes that promise improving the skills of staff and producing visible results. More details on how the transport institutions measure the impacts of capacity building interventions is discussed in *chapter 8.1.*

"Effective capacity building strategies include upskilling and reskilling employees, empowerment, leadership development, outsourcing resources for flexibility, forming partnerships for added value, and streamlining agency processes for efficiency." (Cape Town)

"Building frameworks for creating institutional knowledge-sharing systems, such as establishing internal learning networks or building knowledge repositories." (Trabzon)

The **reputation of the capacity building providers** was mentioned by about a quarter of respondents, which considers the experience and credibility of the entities that provide the capacity development programmes and the profiles of the experts (trainers, mentors) that would provide them.

Surprisingly, the **cost** factor was not mentioned by most respondents, but by only about a quarter of them noting that the cost of participating in a capacity

development programme should be carefully compared with the expected return on investment (ROI). Some institutions recommend, for example looking for possible scholarships and funding opportunities, while others argue that the long-term gains of the capacity development programme may exceed immediate costs.

> *"While some programmes may require a significant financial investment, they may lead to long-term savings by improving staff efficiency, reducing project delays, or enhancing the quality of transport solutions […] Potential impact on project success […]skills acquired may justify higher cost" (Trabzon)*

The format (whether online, in-person or hybrid), **location and accessibility** of capacity development programmes were also mentioned by a few respondents.

Staff considerations refer to the reasons for which transport institutions decide to send or invest in individual staff members receiving or participating in programmes. Consideration factors include staff member qualification and their individual motivation to participate as well as expectations for their professional trajectory.

While not mentioned as often, but some respondents clarified that the **reputation of capacity development programmes** may play a role as well and that they may evaluate them based on feedback from previous participants. Respondents mention programmes with a track record of success being endorsed or supported by recognised organisations in the transport or sustainability sectors such as ICLEI, C40, or the International Road Federation (IRF).

> *"Implement mechanisms to evaluate effectiveness […] and provide feedback and evaluation to make continuous improvements." (Lagos)*

With regards to **duration**, transport institutions mentioned preferring a consistent input over a longer period, instead of short-term condensed trainings. The duration of a capacity format can also affect the availability of staff, where several responses mentioned accounting for the availability of the staff attending the trainings. This indicates a need to choose formats that accommodate the intensive work schedules of potential participants.

> *"Usually, the employee should not be absent too long and it is rather more important to have more inputs over several years than one longer training." (Leipzig)*

8. Impact assessments of capacity development programmes

The ILO views capacity development as an investment of which results and impacts become apparent in the medium- and long-run. (ILO, 2010) Evaluating the outcomes of trainings and capacity building programmes is important for both capacity building funders and providers.

UN-Habitat defines four levels that evaluations can be carried out on: (1) evaluating immediate reactions of participants, which is usually observed after or during a training event, (2) evaluating the learning of individuals, (3) evaluating job performance and (4) evaluating organisational performance, which can be observed after the training on the longer term. (Hasselqvist & Thomas, 2012)

8.1. Perceived capacity development Impact

With this information in mind, the questionnaire asked transport institutions a number of questions related to their perception of the impact of capacity development programmes. This question was an open-ended question capturing respondents' perceived impact of completing capacity building programmes on all three capacity levels: individual, institutional and societal.

8.1.1. On the individual capacities level

On the individual capacity level, most respondents were in consensus, with the majority of the transport institutions highlighting that their perceived impact of capacity building programmes were **improved skills**. Some transport institutions were more specific mentioning improvement in **technical or project management skills** after conducting capacity development programmes (Merida, Sarajevo).

> *"We have participated in specific trainings such as courses on green infrastructure and street design, to learning exchanges with other countries on urban mobility planning, which has **allowed the strengthening of the technical capabilities**" (Merida)*

> *"Staff members have gained enhanced technical skills and knowledge in areas such as **sustainable transport planning, project management, and the integration of innovative technologies like electric vehicles**." (Sarajevo)*

Other recurring answer themes, which were similar to improved skills, included **improved capacities** (3 transport institutions) and **improved knowledge** (4 transport institutions), confirming the running theme of an improvement in capacity and skills of staff.

We observed that only one of the transport institutions mentioned that capacity building could not address all the gaps, as not all capacity gaps are under the purview of the transport institution receiving the capacity building, i.e. some factors may be external.

> *"I perceive that many of the gaps in technical capabilities cannot be addressed solely by my authority" (Oaxaca)*

The majority of responses overall indicate positive outcomes from participating in capacity building programmes, citing not just an improvement in skills, technical and otherwise, but also some transport institutions cite improved **communication** (Leipzig) and **motivation among staff members** (Mexico City).

8.1.2. On the institutional capacities level

With a lesser consensus on the impact of capacity development on the institutional level, most responses were positive, indicating themes such as:

- **Improved project management** (5 transport institutions),
- **Improved cross-departmental coordination** (4 transport institutions), and **Streamlining internal processes** (5 transport institutions)

> *"Better coordinated project management processes" (Mersin)*

8.1.3. On the societal capacities level

On the societal level, half of the respondents indicated an improvement in **inter-institutional coordination** and **collaboration**, with varying details.

> *"Enhanced collaboration among institutions on regulatory issues" (Tirana)*

> *"Coordination and project management processes, creating new idea projects together." (Mersin)*

Some respondents specify the private sector as the stakeholders with which coordination or collaboration improved (Trabzon).

> *"Capacity development programmes also improve institutions' ability to engage the private sector in transport projects. (Trabzon)*

Another recurring theme observed was **increased public awareness of sustainable transport** (4 transport institutions):

> *"We have been able to implement more effective sustainable transport solutions, which in turn have contributed to raising public awareness and acceptance of these initiatives." (Sarajevo)*

Two transport institutions (Sarajevo and Lviv) also cited an increase in support for active mobility.

> *"The good example was the development of new cycling infrastructure standards by Kyiv cycling association for grand funds" (Lviv)*

8.2. Impact assessment indicators of capacity development

After asking about their perceptions, transport institutions were then asked to explain how they measure the impact of capacity development. As the question was an open-ended one, several themes have been identified across the 15 valid responses[18] to this question providing several assessment indicators, which could then be assigned to the different capacity levels. These are shown in the tables below.

8.2.1. On the individual level

Complementary to the previous question, most of the responses indicated assessing the impact of capacity development through observing improvements in the overall quality of work provided by the team as a whole and of individual team members. Respondents spoke of job performance and results, as their assessment indicators.

18 The question on the impact assessment of capacity building programmes was answered by 18 respondents, where three responses were invalid, thus bringing the total number of responses to 15.

Table 19: Capacity development impact assessment indicators on the individual level

Individual level	Transport institutions	No./15
Improved overall quality of work of team and individuals	Merida, Mexico City, Belgrade, Lagos, Lviv, Peshawar, Sarajevo, Yucatán	8
Increased motivation at work	Merida, Oaxaca, Peshawar	3
Enhanced creativity	Lviv, Lagos	2
Enhanced problem-solving capabilities	Lagos, Oaxaca	2
Application of learnings to ongoing or new projects	Mersin, Sarajevo	2
Improvements in analytical and planning capabilities	Tirana	1
Improvements in efficiency	Yucatán	1
Improvements in decision-making	Yucatán	1

Some respondents mentioned increased motivation at work, which is demonstrated via more active participation at work, for example.

A few respondents noted enhanced creativity including an increase in high-quality ideas as well as enhanced problem-solving capacities, which was seen through team members proposing alternative solutions or in conflict resolution settings.

Looking at the assessment indicators on the individual level, it becomes clear that all mentioned indicators are qualitative ones.

8.2.2. On the institutional level

Analysing the responses received brought forward some indicators applicable to the institutional level, with transport institutions mentioning a mix of both qualitative and quantitative indicators, where the latter are starred in .

Table 20: Capacity development impact qualitative and quantitative (*) assessment indicators on the institutional level

Institutional level	Transport institutions	No./15
Meeting project objectives	Kochi, Lagos, Mexico City	3
Improved project completion times*	Kochi, Lagos, Sarajevo	3
Number of projects participations*	Kochi	1
Number of successfully tendered/awarded projects*	Kochi	1
Number of successfully implemented projects*	Sarajevo	1
Improved project execution	Lagos	1

On the qualitative side, three cities spoke about meeting project objectives. In broad terms, this project-related proxy indicator referred to the success of implemented actions and strategies, improving the accessibility and efficieny of public transport network, or the overall improved adherence to sustainability targets.

A quantitative indicator that was also mentioned by three transport institutions was the improvement of project completion time, which includes reducing delays and improving operational efficiency.

8.2.3. On the societal level

Finally, one respondent provided capacity development assessment indicators that could be attributed to the societal level. Both quantitative indicators referred to the institution's capacity to cooperate and collaborate with internal or external stakeholders, measuring the number of meetings and collaboration networks.

Table 21: Capacity development impact quantitative (*) assessment indicators on the societal level

Societal level	Transport institutions	No./15
*Number of meetings**	Merida	1
*Number collaboration networks**	Merida	1

Transport institutions currently tend to assess the impact of capacity development activities based on qualitative observations that show improvement in the overall quality of work instead of using direct and quantifiable indicators.

Comparing the received answers indicates that there aren't any "objective measures" in place (Yucatán), and that instead, organisations may use "associated indicators" (Merida), as they do not have any "established measurement parameters for knowledge acquired" (Merida). As one respondent puts it:

> *"Impacts of learning are more reflected in the planning and implementation of projects." (Kochi)*

Such associated indicators shall be referred to as proxy measures or indicators. Within these proxy measures, transport institutions employ a mix of quantitative and qualitative project-related indicators to assess effectiveness of capacity building programmes. It should be noted that qualitative indicators are typically subjective and difficult to uniformly measure.

> *"While we rely on qualitative observations for now, we are exploring ways to implement more structured evaluation methods in the future." (Yucatán)*

These findings indicate the need to establish frameworks to support transport institutions in assessing the impact of capacity development activities. As practitioners have noted, capacity building is a complex, multi-layered and time-intensive process, and using short-term project-related performance indicators to assess impact may be misleading. (Mizrahi, 2004)

As one respondent commented, the relationship between the duration of capacity building programmes and their impact is important, arguing that short-term workshops and events do not yield relevant or measurable impacts, and that instead, a "sequence of trainings in a specific field has effects." (Leipzig)

As a first step to measuring impact, however, it would be advisable to establish benchmarks. (Mizrahi, 2004) An initial capacity needs assessment can be a helpful tool to identify capacity gaps, the desired capacity levels and to develop the approach to bridge the gap including capacity development activities and resources (Moawad & Abdul Aziz, 2024).

When designing capacity development activities, it is further always advisable to link them to specific, measurable, appropriate, realistic and time-framed (SMART) objectives. (Hasselqvist & Thomas, 2012) These SMART objectives can later serve as benchmarks for the impact assessment.

9. Conclusion

The study underscores the critical importance of investing in capacity development within the transport sector, demonstrating its transformative potential at the individual, institutional, and societal levels. Our findings reveal pressing gaps in education, governance, and socio-economic frameworks that hinder the progress of sustainable transport initiatives across 20 diverse cities.

At the individual level, the study highlights a significant disconnect between current educational offerings and the practical demands of sustainable transport. Many graduates enter the workforce lacking essential skills in sustainability, new technologies, and interdisciplinary approaches. This gap not only perpetuates inefficiencies, but also exacerbates workforce shortages within transport institutions, particularly in essential roles such as procurement, regulation, and marketing. To meet the urgent demands of decarbonisation, transport institutions must prioritise the development of targeted educational programmes that align academic training with industry needs.

Institutionally, the study reveals that governance and planning capacities are critical for successful transport decarbonisation. Clear mandates, inter-agency coordination, and adequate funding are essential enablers, while fragmented responsibilities and financial constraints serve as significant barriers. Successful case studies from institutions focusing on active travel and e-mobility show that effective stakeholder engagement and project management are vital for achieving successful and lasting outcomes.

On the societal level, the legal, political, and socio-economic frameworks can either facilitate or hinder progress. Political instability and complex legal landscapes often disrupt efforts, highlighting the need for robust and adaptable frameworks that support long-term decarbonisation goals. Meanwhile, cooperation framework plays a positive role in supporting effective knowledge exchange and coordination.

Importantly, our research reveals that many transport institutions adopt a reactive approach to capacity gaps, emphasizing the need for more proactive, intentional and structured strategies. By embedding training needs assessments and performance monitoring, institutions can better align their efforts with the evolving demands of sustainable transport.

To effectively transition towards sustainable transport, decision-makers must recognise that transport decarbonisation is not merely an infrastructure challenge, but a holistic undertaking requiring a comprehensive capacity development approach. The commitment to enhance individual, institutional, and societal capacities will yield significant results, thus accelerating the shift towards sustainable mobility in our cities.

Moving forward, we urge mayors, national ministers, and the international donor community to invest significantly in capacity development efforts. By doing so, we can collectively shape a sustainable transport future that is not only achievable, but also equitable and resilient.

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11. Annex

11.1. Methodology

11.1.1. Structure of the questionnaire

The structure of the questionnaire follows the overall understanding of capacity building consisting of three sub-elements, namely the individual capacity level, the institutional capacity level and the societal capacity level.

With this framework in mind, the questionnaire sets out with:

- Providing respondents with guidelines to support the completion of the questionnaire, and
- Presenting a list of relevant terms and definitions.

The questionnaire consists of six main sections:

1. **Transport decarbonisation:** In this section, respondents can indicate the decarbonisation pathways they are actively working on while introducing their organisation and mandate.
2. **Individual capacity:** In this section, respondents are asked about their current and desired workforce. Questions revolve around the number of staff members, their educational backgrounds as well as existing educational programmes within the transport institutions and countries of the respondents. The questionnaire also collects information regarding respondents' recruitment and retention strategies.
3. **Institutional capacity:** In this section, respondents are asked to elaborate on the transport governance, transport planning and technical capacities in their respective institutions. The set of questions captures the supporting and hindering factors guiding the implementation of sustainable transport projects and services. The section also inquires about existing mobility plans or strategies that could guide an overarching vision for transport planning in the institution.
4. **Societal capacity:** This section inquires about the organisations' cooperation and partnership capacity and the degree to which they support knowledge-sharing and co-creation. The other inquiry focuses on the legal, political and socio-economic frameworks that are supporting or hindering the city's performance towards sustainable transport.
5. **Capacity development formats:** This multiple-choice question allows respondents to choose their top three formats which they would choose, on the condition that extra budget is available.
6. **Impact of capacity development programmes:** This section focuses on capturing impact indicators on the individual, institutional, and societal level. The section also reveals how institutions perceive the impact that results from completing capacity building activities.

Overall, the questionnaire incorporates a total of 23 questions throughout the six sections. A third of the questions are closed questions (including multiple-choice answer options) and two-thirds are open-ended to reflect the organisations' experiences in more detail.

11.1.2. Selection criteria of transport institutions

The selection of the transport institutions to be surveyed and featured in this study followed a careful deliberation process with partners of TUMI as well as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Invitations to participate in this study have been extended to a select 34 transport institutions and authorities who **have shown significant progress in one or more of the following pathways towards transport decarbonisation**:

- Phasing out internal combustion engines.
- Elevating walking and cycling.
- Increasing public transport capacity.
- Electrifying at least 70% of rail networks.
- Prioritising electricity as the primary fuel for transport.

11.1.3. Questionnaire duration

Based on extension requests, the data collection period lasted five and a half weeks from August 27 to October 4, 2024. The team reached out to 34 city representatives and received 21 responses from 20 cities.

11.1.4. Respondents sample

The team invited 34 representatives of transport institutions to take part in the study while attempting to balance between:

1. **Regional representation:** Transport institutions from Africa, Asia, Latin America, and Europe are included in the study.
2. **Country income levels:** High-income, upper-middle-income and lower-middle-income cities are included in the study.
3. **City sizes:** Defined by population sizes, small, medium and large cities are included in the study.
   - Small cities (less than one million inhabitants)
   - Medium cities (one to five million inhabitants)
   - Large cities (more than five million inhabitants)

The table below gives an overview of the cities whose transport institutions participated in the questionnaire based on income level, city size, and geographic area.

- The total number of responses received are 21 (two responses are from the same city/geographical context).
- The overview for city size, income level and region are illustrated in *Table 22*.

Table 22: Responses distribution by city size and income level

Region	Country	City	Income level	City size type
Africa	Cameroon	Yaoundé	LMIC	Medium
Africa	Ghana	Accra	LMIC	Large
Africa	Morocco	Casablanca	LMIC	Medium
Africa	Nigeria	Lagos	LMIC	Large
Africa	South Africa	Cape Town	UMIC	Medium
Asia	India	Kochi	LMIC	Medium
Asia	Pakistan	Peshawar	LMIC	Medium
Europe	Albania	Tirana	UMIC	Small
Europe	Bosnia and Herzegovina	Sarajevo	UMIC	Small
Europe	France	Paris	HIC	Medium
Europe	Germany	Leipzig	HIC	Small
Europe	Serbia	Belgrade	UMIC	Medium
Europe	Turkey	Mersin	UMIC	Medium
Europe	Turkey	Trabzon	UMIC	Small
Europe	Ukraine	Lviv	UMIC	Small
Latin America	Brazil	Recife	UMIC	Medium
Latin America	Brazil	São Caetano do Sul	UMIC	Small
Latin America	Mexico	Merida, Yucatán	UMIC	Small
Latin America	Mexico	Mexico City	UMIC	Large
Latin America	Mexico	Oaxaca	UMIC	Medium

Analysis of the featured cities:

- **In total:** the study features transport institutions from 20 cities across 16 countries from 4 continents.
- **From Africa:** 5 cities in 5 countries: 1 in North Africa, 4 in sub-Saharan Africa. All cities are LMICs, apart from Cape Town in South Africa. 3 medium-sized cities and 2 large-sized cities (Lagos and Nigeria).
- **From Asia:** 2 cities from 2 countries in Asia, both medium-sized LMICs in South Asia (Kochi and Peshawar).
- **From Europe:** 8 cities from 7 countries, all UMICs, apart from Leipzig and Paris being in HICs. All are small-sized cities, except Belgrade, Mersin and Paris which are medium-sized cities.
- **Latin America:** 5 cities from 2 UMICs. 2 of these cities are small-sized, 2 medium-sized (Recife and Oaxaca) and 1 is large-sized (Mexico City).
- **By income level:** The respondents represent 2 HICs, 6 LMICs and 8 UMICs.
- **By city size:** 7 small-sized cities, 10 medium-sized cities, and 3 large cities.

11.2. Questionnaire form

11.2.1. Transport decarbonisation targets

1. What are the transport decarbonisation targets your city is pursuing? Please select all that apply. [multiple-choice and open-answer]

- ☐ Phasing out internal combustion engines
- ☐ Elevating walking and cycling
- ☐ Increasing public transport capacity
- ☐ Electrifying at least 70% of rail networks.
- ☐ Prioritizing electricity as the primary fuel for transport.
- ☐ Other:

Feel free to add further details on how your city plans on achieving these targets through actions items such as: facilitating the deployment of zero emission vehicles or biofuels, increasing public transport supply, pedestrian infrastructure, setting vehicle efficiency targets, etc.

2. What is the role of mandate of your organization in achieving these climate and sustainability targets? [open-answer]

11.2.2. Individual capacity

Number of Staff

3. Planning, designing, funding and implementing transport services and projects requires sufficient staff in different departments. For your and/or other relevant departments, please fill out the below table indicating the existing number of staff members and the desired number of staff members in your organization's different departments focusing on road and rail-based passenger and freight transport services and infrastructure. [closed question with open-answer option]

Departments	Existing number of staff members	Desired number of staff members
Planning	Insert number.	Insert number.
Regulation	Insert number.	Insert number.
Budgeting	Insert number.	Insert number.
Procurement	Insert number.	Insert number.
Operations & Maintenance	Insert number.	Insert number.
Marketing & Customer Management	Insert number.	Insert number.
Construction	Insert number.	Insert number.
Other: Click or tap here to enter text.	Insert number.	Insert number.

4. What are the strategies that your organisation implements to attract skilled staff members? [open-answer]

5. What are the strategies that your organisation implements to retain skilled staff members? [open-answer]

Staff education

6. When you recruit new staff, which educational backgrounds do you typically look for? [multiple-choice]

- ☐ Road and transport engineering
- ☐ Architecture
- ☐ Economics
- ☐ Urban planning
- ☐ Other: Click or tap here to enter text.

7. In the case where you notice staff members are lacking specific technical capacities (education, skills, or experience), how do you address this? [open-answer]

Education Gap

8. In your city/country, which educational programmes (both academic and executive programmes) exist focusing on transport and mobility? Please mention the name of the programme and the academic or non-academic institution providing them. [open-answer]

9. In your opinion, are the existing educational programmes sufficient to address your climate and sustainability targets in the transport sector? [open-answer]

10. In your opinion, to what extent do the existing educational programmes focusing on transport and mobility in your city cover sustainability in transport? [open-answer]

11.2.3. Institutional capacity

11. **Transport governance:** How does the current governance structure in your city/country support or hinder your organization to plan, design, and implement transport projects related to sustainability and decarbonisation? [open-answer]

12. **Transport planning:** Are there well-established mobility plans or strategies that guide and facilitate long-term sustainable transport planning for your organisation? [open-answer]

13. **Technical capacity:** What are some success stories from your organisation in planning and implementing high quality, well-designed transport infrastructure without major delays? [open-answer]

11.2.4. Societal capacity

14. **Cooperation and partnerships capacity:** How easy is it for your organisation to cooperate with other organisations (government and non-government partners) to establish and develop networks for knowledge-sharing and co-creation? Choose an item.
    - How often do you cooperate? (once a year, 2 times a year, 4 times a year, more than 4 times a year) Choose an item.

15. **Enabling frameworks:** How does the legal, political, and socio-economic frameworks in your city/country support or hinder your performance for sustainable transport? [open-answer]

11.2.5. Capacity development formats

16. If you had a budget to spend on capacity development, which capacity development format from the below would you choose, and why? You can pick up to 3 choices. [Multiple choice & open-answer]

- ☐ Seminars
- ☐ Workshops
- ☐ Conferences
- ☐ Trainings
- ☐ Study tours
- ☐ Mentorship
- ☐ Peer reviews
- ☐ Associations, committees, working groups
- ☐ Scholarships
- ☐ Customised Reports
- ☐ Formal education
- ☐ MooCs (Online training course)
- ☐ Access to data portals and libraries

17. On a scale of 1-5, how important do you think the following are for the achievement of climate and sustainability targets in the transport sector?
[5 being the highest and 1 the lowest]

Capacities	Rating (1-5)
Number of staff: number of staff employed to address the city's sustainability/climate targets in the transport sector	Choose a rating.
Staff education: having staff members with an educational background related to transport	Choose a rating.
Education gap: presence of educational programs focusing on transport and mobility	Choose a rating.
Sustainable education gap: presence of existing educational programmes focusing on mobility and transport sustainability	Choose a rating.
Transport governance: the capacity to plan, design and implement transport services and projects	Choose a rating.
Transport planning: the presence of well-established mobility plans or strategies is for the achievement of transport decarbonization.	Choose a rating.
Technical capacity: technical capacity to plan and implementing high quality, well-designed transport infrastructure without major delays	Choose a rating.
Cooperation and partnerships capacity: cooperating with other organizations to establish and develop networks for knowledge sharing and co-creation	Choose a rating.
Enabling frameworks capacity: presence of legal, political, and socio-economic frameworks supporting your performance for sustainable transport	Choose a rating.

18. On a scale of 1-5, how would you assess your organisation's current situation with regards to the capacities below?
(5 being the highest and 1 the lowest)

Capacities	Rating (1-5)
Number of staff: number of staff employed to address the city's climate targets in the transport sector	Choose a rating.
Staff education: having staff members with an educational background related to transport	Choose a rating.
Education gap: presence of educational programs focusing on transport and mobility	Choose a rating.
Sustainable education gap: presence of existing educational programmes focusing on mobility and transport sustainability	Choose a rating.
Transport governance: the capacity to plan, design and implement transport services and projects	Choose a rating.
Transport planning: the presence of well-established mobility plans or strategies is for the achievement of transport decarbonization.	Choose a rating.
Technical capacity: technical capacity to plan and implementing high quality, well-designed transport infrastructure without major delays	Choose a rating.
Cooperation and partnerships capacity: cooperating with other organizations to establish and develop networks for knowledge sharing and co-creation	Choose a rating.
Enabling frameworks capacity: presence of legal, political, and socio-economic frameworks supporting your performance for sustainable transport	Choose a rating.

11.2.6. Impact of capacity development programmes

19. Please share your experience on what kind of impact you perceived after completing the capacity development programmes on:
[open-answer]
    - On the individual capacity level:
    For example: Improved skills or knowledge of staff, etc.
    - On the institutional capacity level:
    For example: Faster internal processes, etc.
    - the societal capacity level:
    For example: Better coordination between governmental entities, new laws and regulations, etc.

20. What are key considerations when choosing specific capacity development programmes for your staff?
[open-answer]

21. To what extent do climate and sustainability targets do play a role in selecting capacity-development formats?
[open-answer]

22. How do you measure the impact of the learnings from capacity development programmes after completion?
[open-answer]

23. If you would like to share more details on your experience with capacity development programmes for the planning or achievement of transport decarbonisation goals, please use this answer box.
[open-answer]

11.3. Data analysis : Staff gap disaggregated by income level, region and city size

11.3.1. Staff gap disaggregated by income level

Transport institutions in high-income cities had the lowest staff gaps (40%) compared to those in LMICs (97.7%) and UMICs (106%). The low percentage of staff gaps in HICs can be due to the availability of more resources in these cities, which can be allocated towards hiring more staff members.

- For HIC cities, the staff gap is most apparent in the **planning department**, where transport institutions indicated having an average of 63% of the desired capacity, indicating a need for a 60% increase.
- For LMIC cities, the staff gap is most visible in the **regulation department** where transport institutions indicated having on average 36% of the desired capacity, indicating a 175% increase needed.
- For UMIC cities, the staff gap is most visible in the **procurement department** where transport institutions indicated having on average 38% of the desired capacity, requiring a 162% increase.

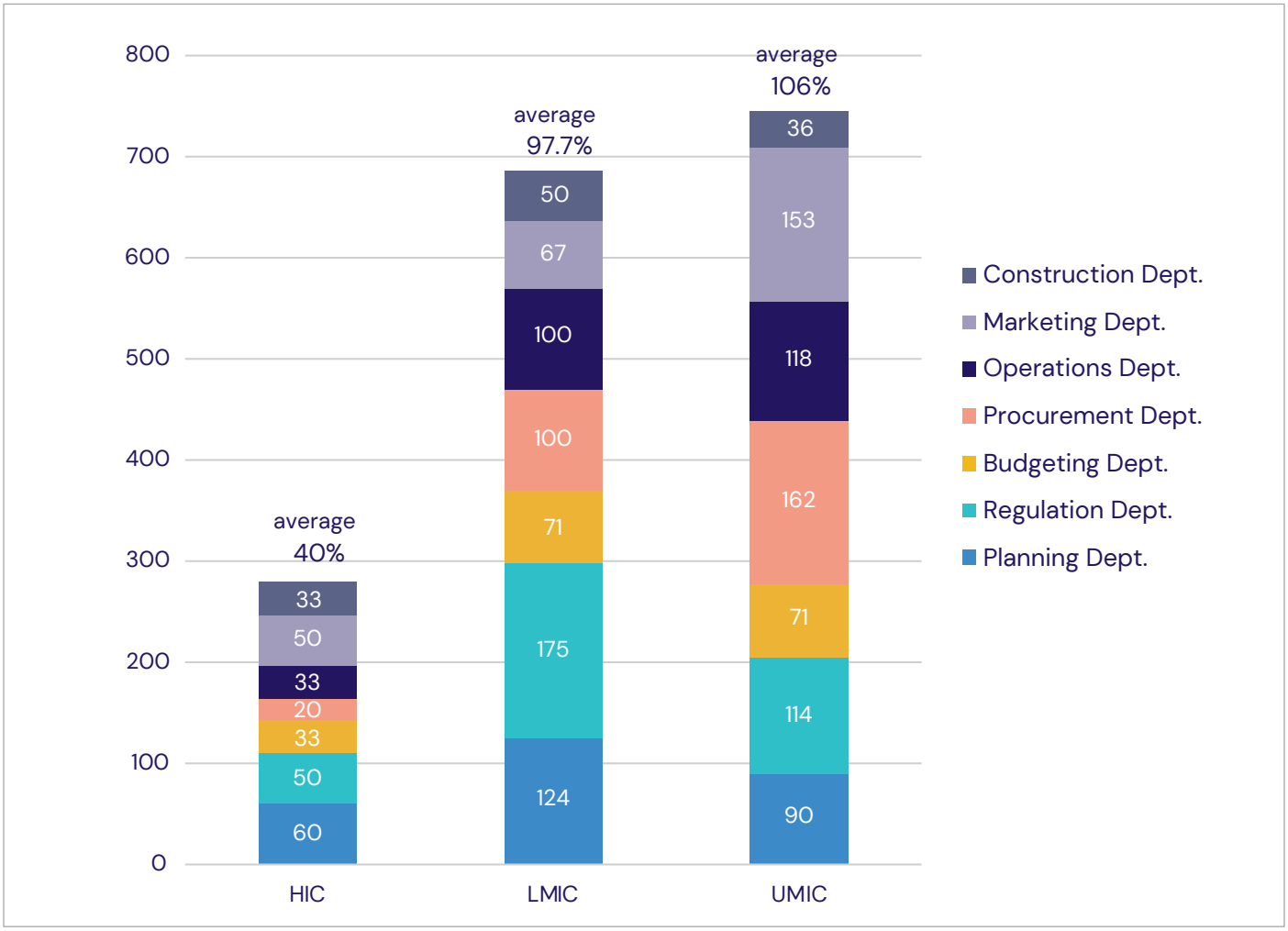

Figure 24: Average capacity increases of different departments disaggregated by income level

11.3.2. Staff gap disaggregated by city size

- For large cities, the staff gap is highest in the **planning department** with transport institutions reporting having an average of 49% of the desired capacity, and indicating a need for a 105% increase.
- For medium cities, the staff gap is highest in the **operations department** with transport institutions reporting having an average of 37% of the desired capacity, requiring a 170% increase.
- For small cities, the staff gap is most pronounced in the **procurement department**, with transport institutions reporting having 39% of of the desired capacities, requiring a 154% increase.

These findings can indicate more dependency on outsourcing functions for small cities, and an increased role in operations and planning in bigger cities.

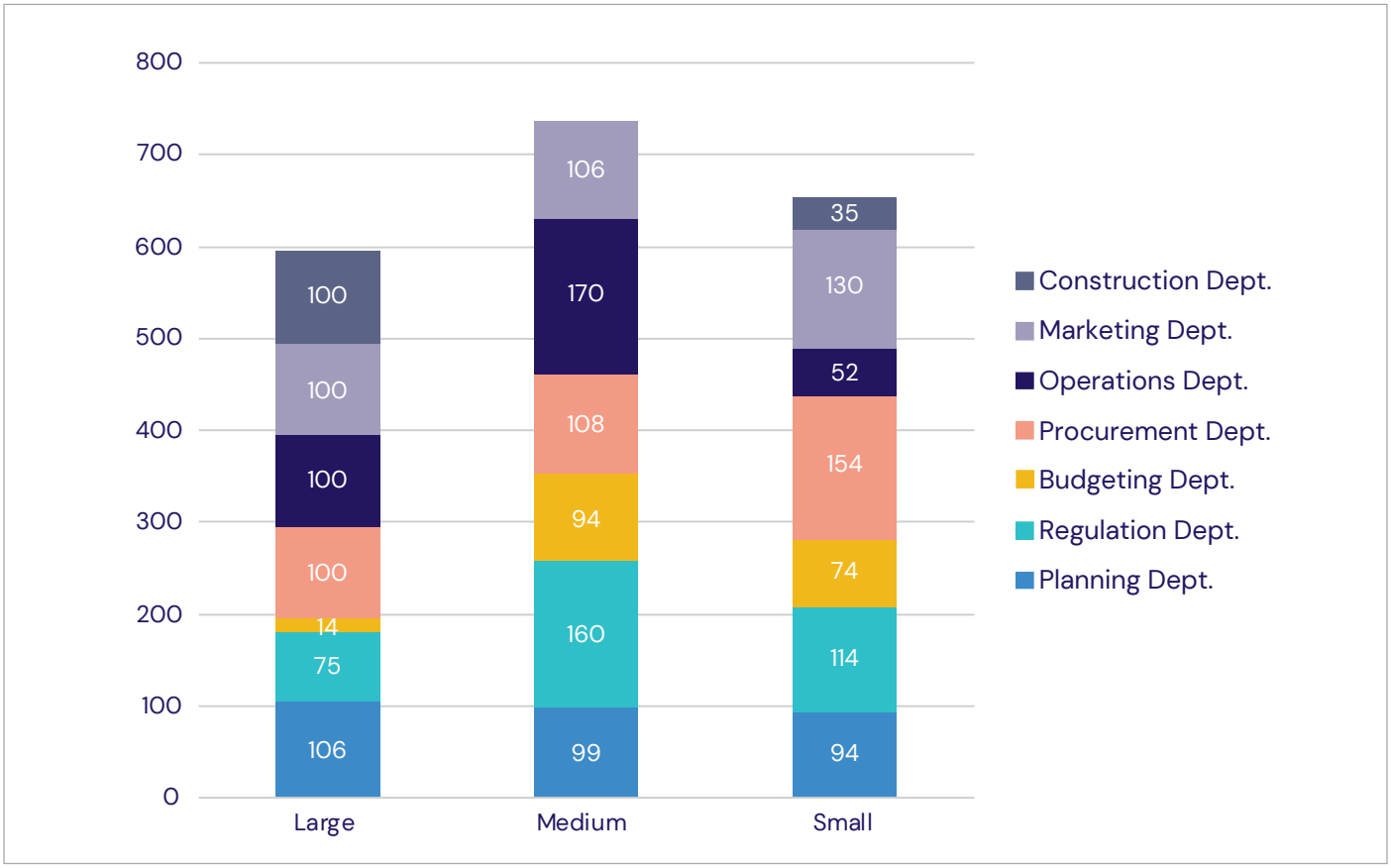

Figure 25: Average capacity increases of different departments disaggregated by city size

11.3.3. Staff gap disaggregated by region

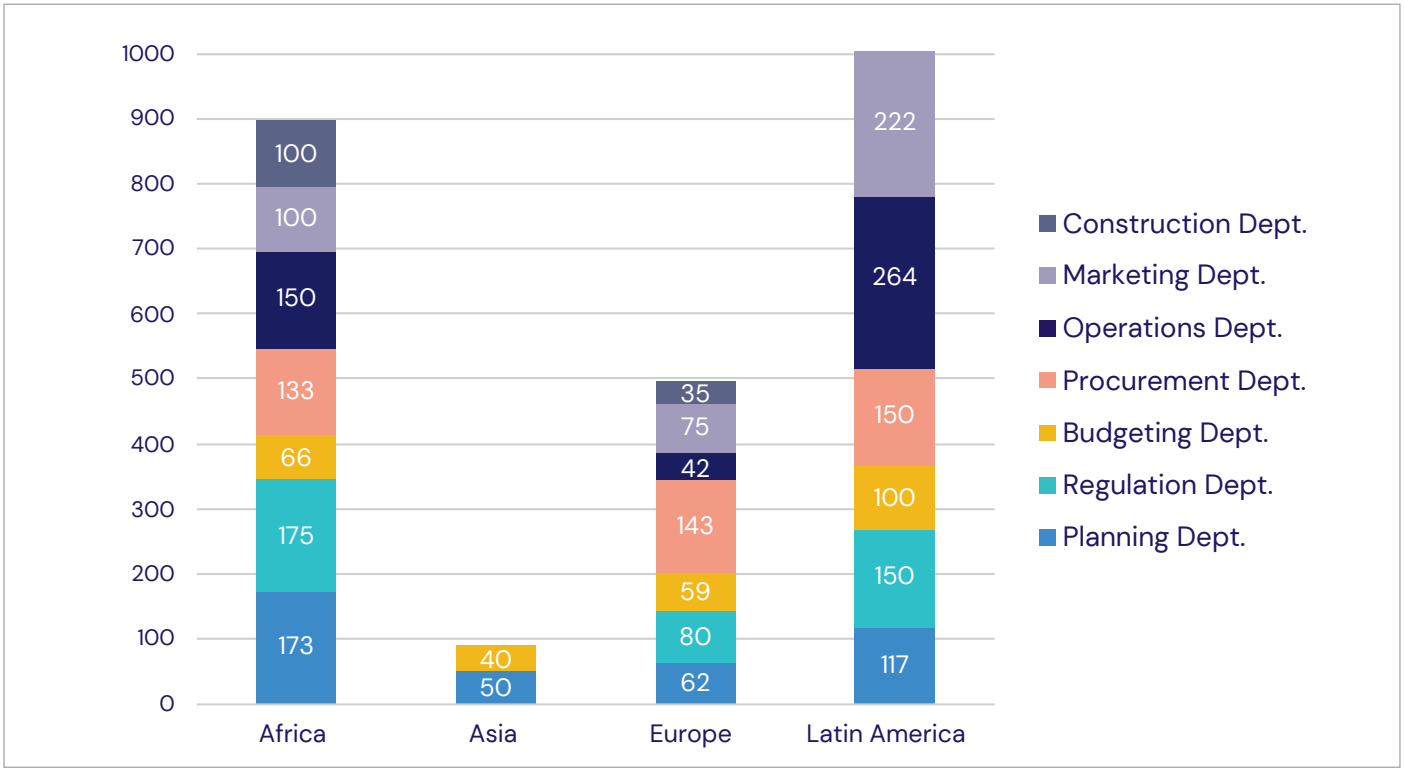

Figure 26: Average capacity increases of different departments disaggregated by region

Generally, transport institutions in Africa (128%) and Latin America (167%) had the highest staff gaps, compared to Europe (71%), and Asia (15%). The exceptionally low percentage indicated by Asian transport institutions can be owed to the fact that only two transport institutions are represented from Asia in the study. Additionally, both responses came from special purpose vehicles (SPVs), not purely public authorities., which may indicate their focus-driven nature, thus hiring particularly qualified staff members.

To avoid skewing the comparison by including Asia, we opted to focus the analysis on Africa, Europe and Latin American transport institutions in this section:

- For African transport institutions, the average staff number is at 36% of the desired capacity in the **regulations department, which showed the highest capacity gap**.
- For European transport institutions, the average staff number is 41% of the desired capacity in the **procurement department, which showed the highest capacity gap**.
- For Latin American transport institutions, the average staff level is only a quarter (27%) of the desired capacity in the **operations department, which has the biggest capacity gap**.

It should be noted, however, that not all respondents provided answers (numbers) to this question across all the departments. This can be explained by the following points:

- Institutions may not perform all the roles, and this is why understanding the mandates of the participating institutions, their type, whether they are private or public, or a joint venture between both, would place these numbers in clear contexts, and relate them to the performance of the institutions.
- Participants may not have access to all staff numbers, existing and desired, across all departments performing tasks related to urban transport.
- In multiple instances, transport institutions submitted values indicating no current capacity, i.e. zero existing staff members, but added values to the desired capacities. This was interpreted by the team to be referring to either an institutional need to create some new departments, or that their functions are performed within other departments.

11.4. Providers and specialisation of educational programmes listed by respondents

The list of programmes is non-exhaustive, but these programmes provide insights into the disciplines which transport institutions depend on to obtain their education in sustainable mobility.

11.4.1. Transport educational disciplines

Table 23: Type, provider and specialisation of educational programmes

City	Type of programme	Providers	Specialisation
Non-academic programmes			
Lagos	Courses/Workshops/Training programmes	Lagos Metropolitan Area Transport Authority (LAMATA) Annual Sustainable Urban Mobility Course in collaboration with Ochenuel Mobility	LAMATA's Annual Sustainable Urban Mobility (SUM) Course which works on enhancing skills for those engaged in planning, implementation, and management of urban transport systems
Lagos	Courses/Workshops/Training programmes	Chartered Institute of Logistics and Transport (CILT) - Nigeria	transport management, logistics, and infrastructure development.
Leipzig	Courses/Workshops/Training programmes	German Institute for Urban Affairs (Difu)	-
Leipzig	Courses/Workshops/ Training programmes	Federal Office for Logistics and Mobility (BALM)	-
Sarajevo	Courses/Workshops/Training programmes	Heinrich Böll Foundation (office in Sarajevo)	Green policies (including sustainable mobility), sustainable mobility planning, increasing public transport, integration of cycling lanes into urban settings
Sarajevo	Courses/Workshops/Training programmes	Center for Education and Raising Awareness on Energy Efficiency (ENERGIS)	Seminars and workshops on sustainable mobility and energy efficiency in transport. (Sustainable urban mobility planning and integration of electric vehicles)
Sarajevo	Courses/Workshops/Training programmes	Association for Economic Development REDAH (based in Mostar)	Economic development (elements on sustainable mobility)
Sarajevo	Courses/Workshops/Training programmes	Association for Economic Development REDAH (based in Mostar)	Development and implementation of sustainable transport systems
Sarajevo	Courses/Workshops/Training programmes	Green Council (NGO)	Urban planning and transport sustainability (CO_2 reduction in the transport sector and AT infrastructure)
Trabzon	Courses/Workshops/Training programmes	Turkish Ministry of Transport and Infrastructure	ongoing technical and management training for government officials working in transport and mobility, covering areas such as smart transportation systems, rail transport, and decarbonisation strategies.
Trabzon	Courses/Workshops/Training programmes	International Road Federation (IRF) - Turkey Branch	non-academic executive programmes focus on improving road safety, urban mobility solutions, and sustainable transport infrastructure in Turkey

Academic programmes			
Accra	Higher Education - Graduate or Undergraduate Studies	Kwame Nkrumah University of Science and Technology	Transport Planning, Transport Engineering, Urban Planning
Accra	Higher Education - Graduate or Undergraduate Studies	University of Ghana	Urban Planning
Belgrade	Higher Education - Graduate or Undergraduate Studies	University of Belgrade	Faculty of Traffic and Transport
Cape Town	Higher Education - Graduate or Undergraduate Studies	Universities of Cape Town and Stellenbosch	Transport economics, transport planning, traffic engineering and civil engineering
Kochi	Higher Education - Graduate or Undergraduate Studies	Center for Environmental Planning and Technology (CEPT)	Urban planning, Urban designing, Urban Transport systems
Kochi	Higher Education - Graduate or Undergraduate Studies	School of Planning and Architecture	Transport planning, Urban planning
Kochi	Higher Education - Graduate or Undergraduate Studies	Gati Shakti Vishwavidyalaya (GSV)	Civil Engineering, Railway engineering
Kochi	Higher Education - Graduate or Undergraduate Studies Technical Institute	National Institute of Technology (NIT)	Electric Vehicle Engineering, Transportation engineering, Urban planning
Lagos	Higher Education - Graduate or Undergraduate Studies Higher Education – Executive programme	Yaba College of Technology (YABATECH)	Transport and Logistics Programmes (Transport management, with a focus on logistics, supply chain management, and the fundamentals of transport systems)
Lagos	Higher Education - Graduate or Undergraduate Studies	University of Lagos (UNILAG)	Department of Civil and Environmental Engineering (transport engineering, traffic management, and infrastructure planning)
Lagos	Higher Education - Graduate or Undergraduate Studies	LASU School of Transport and Logistics Lagos State University (LASU)	Bachelors in Transport and Logistics Management (in-depth knowledge of transport management, logistics, and supply chain management, focusing on both the public and private transport sectors.)
Lagos	Higher Education - Graduate or Undergraduate Studies	LASU School of Transport and Logistics Lagos State University (LASU)	Postgraduate Programmes in transport planning, transport economics, and logistics management.
Lviv	Higher Education - Graduate or Undergraduate Studies Higher Education – Executive programme	National University Lviv Politechnik	Department for Transport technologies
Lviv	Higher Education - Graduate or Undergraduate Studies Higher Education - Graduate or Undergraduate Studies	Ivan Franko National University, Kharkiv School of Architecture	Urbanism, urban planning and sustainable spatial development

Merida	Higher Education - Graduate or Undergraduate Studies	Autonomous University of Yucatan (UADY)	Bachelor in Habitat Design, Master in Urban Design
Merida	Higher Education - Graduate or Undergraduate Studies	National Autonomous University of Mexico - La Escuela Nacional de Estudios Superiores (ENES UNAM)	Bachelor's Degree in Geography, Master's Degree in Urban Project Management
Mexico	Higher Education - Graduate or Undergraduate Studies	National Autonomous University of Mexico (UNAM)	Civil Engineering Programme (Land Transportation specialisation)
Mexico	Higher Education - Graduate or Undergraduate Studies	Institute of Polytechnic Studies (IPN)	Transportation engineering
Paris	Higher Education - Graduate or Undergraduate Studies	National School of Bridges and Highways (Ecole des ponts et chaussée)	Architecture, engineering, climate and sustainability
Recife	Higher Education - Graduate or Undergraduate Studies	Federal University	Transportation courses
Sarajevo	Higher Education - Graduate or Undergraduate Studies	University of Sarajevo	Transport engineering and logistics (planning/management/ optimisation of transport systems)
Tirana	Higher Education - Graduate or Undergraduate Studies Higher Education – Executive programme	Albanian Institute of Business	Executive Programme in Logistics and Supply Chain Management
Tirana	Higher Education - Graduate or Undergraduate Studies	Polytechnic University of Tirana	Master in Transport Engineering (covers various aspects of transport systems, including design, management, and sustainable practices)
Tirana	Higher Education - Graduate or Undergraduate Studies	Polytechnic University of Tirana	Master in Urban Planning (urban mobility, land use, and transport planning)
Tirana	Higher Education - Graduate or Undergraduate Studies	University of Tirana	Bachelor in Civil Engineering (Major in Transport) - courses on road and transportation infrastructure, integrating transport-related subjects into the civil engineering curriculum.
Trabzon	Higher Education – Executive programme	International Road Federation (IRF) - Turkey Branch	non-academic executive programmes focus on improving road safety, urban mobility solutions, and sustainable transport infrastructure in Turkey
Trabzon	Higher Education - Graduate or Undergraduate Studies Higher Education – Executive programme	Bogazici University	focusing on sustainable mobility practices, smart cities, and modern transportation management techniques

Trabzon	Higher Education - Graduate or Undergraduate Studies	Karadeniz Technical University (KTU)	Transportation Engineering Specialisation (Master's and PhD programmes) - specialised training in transport planning, traffic engineering, and infrastructure design
Trabzon	Higher Education - Graduate or Undergraduate Studies	Istanbul Technical University	urban mobility, traffic manage-ment, and sustainable transport solutions, advanced transport systems and intelligent transportation technologies
Trabzon	Higher Education - Graduate or Undergraduate Studies	Middle East Technical University (METU) - City and Regional Planning Department	integrating urban planning with transportation networks, addressing sustainability, public transit, and transportation policy within the urban context.
Yaounde	Higher Education - Graduate or Undergraduate Studies	Ecole normale supérieure des travaux publics (National Advanced School Of Public Works)	Master's degree in transport and urban mobility.
Yucatan	Higher Education - Graduate or Undergraduate Studies Higher Education – Executive programme	Instituto Mexicano del Transporte (IMT) - Diploma in sustainable mobility	Sustainable mobility solutions, including public transportation planning and electromobility.
Yucatan	Higher Education - Graduate or Undergraduate Studies	Universidad Autónoma de Yucatán (UADY) - Masters in Urban and Regional Planning	Urban development, planning, and mobility systems
Yucatan	Higher Education - Graduate or Undergraduate Studies	Universidad Tecnológica Metropolitana (UTM)	Undergraduate programme: transportation engineering (foundation in transportation systems, logistics, and infrastructure)

Table 24: Transport educational disciplines categorisation and number of transport institutions that mentioned each.

Educational disciplines	Transport institutions	No./21
Transport and traffic engineering	Accra, Belgrade, Cape Town, Kochi, Lagos, Lviv, Mexico, Paris, Peshawar, Recife, Sarajevo, Tirana, Trabzon, Yucatán	14
Urban planning and design	Accra, Kochi, Leipzig, Lviv, Merida, Oaxaca, Peshawar, Tirana, Trabzon, Yucatán	10
Civil engineering	Cape Town, Lviv, Mexico, Oaxaca, Tirana, Trabzon	6
Transport planning	Accra, Cape Town, Kochi, Lagos, Lviv, Trabzon	6
Logistics and supply chain management	Lagos, Sarajevo, Tirana, Yucatán	4
Urban mobility	Kochi, Trabzon, Yaoundé, Yucatán	4
Transport economics	Cape Town, Lagos	2
Transport technologies (vocational trainings)	Kochi, Trabzon	2
Geography	Merida	1